URBAN DWELLING ENVIRONMENTS: BOGOTA, COLOMBIA

by

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B. Arch., Universidad Nacional de Colombia, Bogota, Colombia

1970

Submitted in partial fulfillment of the requirements

for the degree of

Master of Architecture in Advanced Studies

at the

Massachusetts Institute of Technology

June, 1976

Signature of Author.....
Department of Architecture, May 7, 1976

Certified by.....
Thesis Supervisor

Accepted by.....
Chairman, Department Committee on Graduate Students

URBAN DWELLING ENVIRONMENTS-BOGOTA, COLOMBIA - EVALUATION OF THREE SELECTED CASES

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ABSTRACT

This is a study of existing urban dwelling environments in Bogota, Colombia. The study provides a reference for the understanding of dwelling environments of the urban areas and is intended as a tool for the formulation of housing policies in Bogota, Colombia.

The case study analysis is based on a methodology developed in the Urban Settlement Design in Developing Countries Program.

An urbanization proposal is developed, based on the case studies. The proposal provides a set of alternative guidelines for urban land subdivision and land utilization in Bogota.

Thesis Supervisor: Horacio Caminos
Title: Professor of Architecture

ACKNOWLEDGEMENTS

I gratefully acknowledge the valuable guidance, criticism, and advice of Professor Horacio Caminos in the study and elaboration of this work during the second year of my studies, as well as the preparation received from him during the first year. I am grateful to Reinhard Goethert for his assistance and help, and to all my condisciples for their collaboration.

I wish to show my gratitude to the Universidad Nacional de Colombia and ICETEX for the financial support in the accomplishment of this study.

I am also grateful to the Directives of Instituto de Crédito Territorial and specially to Architect Cecilia Alvarez Pereira for the material, facilities and information received; Empresas de Acueducto y Alcantarillado, y Energía Eléctrica de Bogotá for their specialized information; Architect Fernando Ruiz Gutierrez for his bibiliographic materials and personal knowledge of facts; Architect Arturo Perez in developing the photographs; my sister Carola Robledo Ocampo for gathering last minute information, and Elizabeth Steeves for revision of the English text.

The photograph credits belong to Architect Arturo Robledo Ocampo, Movifoto of Medellin, and José Enrique Robledo Ocampo.

Finally I am grateful to my wife Silvia for the typing of this work and for her continuous support during the process of time of this study.

CONTENTS

PREFACE

This work proposes to evaluate Urban Dwelling Environments using the methodology, procedures and format developed in the program "Urban Settlement Design in Developing Countries," directed by Professor Horacio Caminos. With this purpose three superblocks of Ciudad Kennedy in Bogotá, were chosen each one of them with different types of dwellings. In the first part of the work the city is introduced within the context of land utilization, as well as the chosen locality as it relates to the whole city. There follows a description of the city in its physical aspects as a result of topographic, economic and social aspects; description of the locality in layout, land utilization and circulation system; a description of each superblock from the point of view of land subdivision, land utilization, dwellings and infrastructure services; and finally a proposal in two of the superblocks evaluated as a reference and comparison with the existing situation.

This work may be used as a reference for evaluating and studying any urban dwelling environment and to formulate new policies for a better land utilization in order to reduce costs of urbanization and to provide more efficient services and utilities.

The majority of information for this work, together with the field surveys and some of the photographs, were collected by the author in the city of Bogotá during the summer vacation of 1975. Some other information was received during the elaboration of the final work; the information not available was submitted according to the author's judgement. The plans were almost totally furnished by I.C.T. maps and air photographs by Instituto Geográfico "Agustín Codazzi."

NOTE OF THE AUTHOR: This study does not intend in any manner to discredit the work done by others, nor to propose unique or conclusive solutions. It only intends to describe a real fact and to compare it with a possible alternative in terms of land use with the honest purpose of calling attention to a matter that has been overlooked. Finally I wish to be excused for any inaccurate information or involuntary deviation from truth.

INTRODUCTION

BOGOTA, THE METROPOLIS: The rapid and uncontrolled growth of Bogotá simultaneously has contributed to a larger enrichment of the rich and to a more serious situation for the poor, with the consequent increase of criminality and social discontent.

The advantages and opportunities that a big city affords become nullified because of the endless number of disadvantages due to pollution, congestion, insecurity, unemployment and too high expectations. In the physical aspect and on a large scale, the labors of private urbanizers and public agencies, seconded by illegal urbanizers. extend the city as an enormous carpet without the convenient supply of efficient services. In other cases these services are overdesigned and community facilities ironically sub-utilized often with waste of public areas and considerable enlargement of distances within the city, hence increasing the urbanization costs that in the end will be absorbed by the users themselves.

In this aspect and because of its magnitude, growth and transformation circumstances, location and self-sufficiency, Ciudad Kennedy is presented as a clear point of reference to the city of Bogotá. It is also considered an important locality since it is a concrete example of hard contrasts and reflects in a concentrated way the existing situation of the greater Bogotá.

CIUDAD KENNEDY: THE CITY WITHIN THE CITY. Ciudad Kennedy occupies the land that used to belong to the former airport of Bogotá in the western part of the city. The distance between it and downtown Bogotá is nearly 9 kilometers and the extension of the jurisdiction of the great Ciudad Kennedy is about 405 hectares.

ORIGINS: The preliminary work was initiated in 1962, when John F. Kennedy was President of the United States and funds were easily obtainable through the "Alianza para el Progreso," as well as the Colombian Government and the private sector. A considerable part of its first populators were refugees who came from the countryside escaping from the political violence, and most of its population belongs to migration from other regions of the country. The entire population is located in the medium and low incomes. The dwellings are composed of multifamily buildings, smaller buildings, and individual dwellings. The construction systems were diverse, such as self-construction, direct administration by I.C.T., dwellings given to the users without being finished, plan for buyer-investor and I.C.T., plan for workers etc.

The communal equipment is sufficiently complete and the supply of all services covers most of the great Ciudad Kennedy.

Because of its magnitude and importance it constitutes the first satellite city of Bogota, and thus Ciudad Kennedy was created as a Minor Jurisdiction of Bogota under a Minor Mayor who controls annexed areas.

BOGOTA, COLOMBIA

URBAN CONTEXT

1. Bogota is located on the eastern part of the fertile and extensive plateau called "Sabana de Bogotá" in the Eastern Mountain chain, one of the three branches of the Andes in the Colombian territory. The geographical situation of the city is considerably central in relation to the rest of the country. Latitude is 4° 35' 56.57" North and longitude, 74° 04' 51.13" West. The average temperature is 14° C, corresponding the equinox to the rain periods and the solstice to dry and warm periods.

2. The city was founded in 1538 by Gonzalo Jimenez de Quesada, in his search for El Dorado, after reducing to submission the Chibcha inhabitants who were the most advanced indigenous civilization in territory of Colombia. From that epoch on, the city began developing with its three main population groups: the Spanish colonist, the native, and the mestee. After going through several stages, among them being the capital of the vast colonial empire that included Colombia, Ecuador, Venezuela and Panama, Bogotá then became the capital of the Republic of Colombia and of the Department of Cundinamarca, and at last the Special District of Bogotá.

3. In 1972 the annual family income was U.S. $ 1,900. The population able to work represents 30.1% of the total; 62.7% of that percentage corresponds to white collar workers and 12.8% are laborers. The manufacturing industry is 25% of the total national gross. The construction of buildings occupied 90% of the construction industry in the period 1960-70. Of the population able to work 16.1% does not have a job; the participation of the city in the internal national gross product fluctuates between 20% and 30%.

BOGOTA, COLOMBIA: The central part of Bogotá is plenty of contrasts and mixture of uses: colonial and new buildings; low income housing by the side of multifamily high-rise for higher incomes; hotels and slums; offices and diversion, all of them sometimes found in the same concentrated area.

4. Bogota is the seat of the National Government, of the Department, and of the city itself. It became Special District in order to control the growth of the city and to acquire domain and jurisdiction over its neighboring municipalities. Bogotá is ruled by a Major Mayor, a Council and 17 Minor Mayors.

5. In 1975 the estimated population was 3,740,000, the average annual increase is 6.8% from which 29% is attributed to natural population growth and the rest to migration. Of the total, 39% are under 15 years of age and 34.5% are between 15 and 34 years of age. The average urban density is 125 persons per hectare.

6. In 1972 in Colombia the ethnic divisions were represented by the following percentages: 20% white population, 70% mestee, 5% natives indigenous, and 5% blacks. In Bogotá the white percentage increases considerably, while the percentage of mestee decreases due to the many European type inhabitants, and because Bogotá was one of the most important cities in Latin America chosen by the Spanish for their colonies. The percentages of incomes reflect the situation of those of the ethnic groups, with the white population having incomes more than U.S. $ 170 and the minorities U.S. $70 per month.

7. The lowest income groups composed in majority of country people are located mainly in the southern part of the city in "tugurios," or squatter settlements, and are pressed together in tenements from the center to the south of the city. Others are located in the western part, and a few of them lean against the foothills of the mountains that border the city on the east. The higher incomes tend to live to the north and very few are located near the center of the city.

8. There are lots without services found in "Barrios Piratas" (clandestine urbanizations) with prices as low as U.S. $4,50 Mt^2. The minimum area allowed for lots according to statute of the council of 1965-1967 was 65 Mts^2, but there are lots of 7 by 7 Mts. found in clandestine urbanizations. The system of increasing amortization has replaced the system of fixed quota in acquiring properties. In 1970 the value of a minimum complete dwelling was calculated in U.S. $1,200 with a minimum required monthly income of U.S. $ 60 for credit. From these figures it is evident that only 35% of urban families can afford a minimum complete dwelling. The accumulative deficit of dwelling units until 1970 was 135,000 units and it has been estimated that there will be an accumulative deficit of 310,000 units before 1980, with a resulting deficit of 70,000 units per year with only 10,000 to 15,000 units being built by Government and Public Organizations. The minimum existing dwelling is estimated at 40 $Mts.^2$ with a cost of U.S. $15 Mt^2.

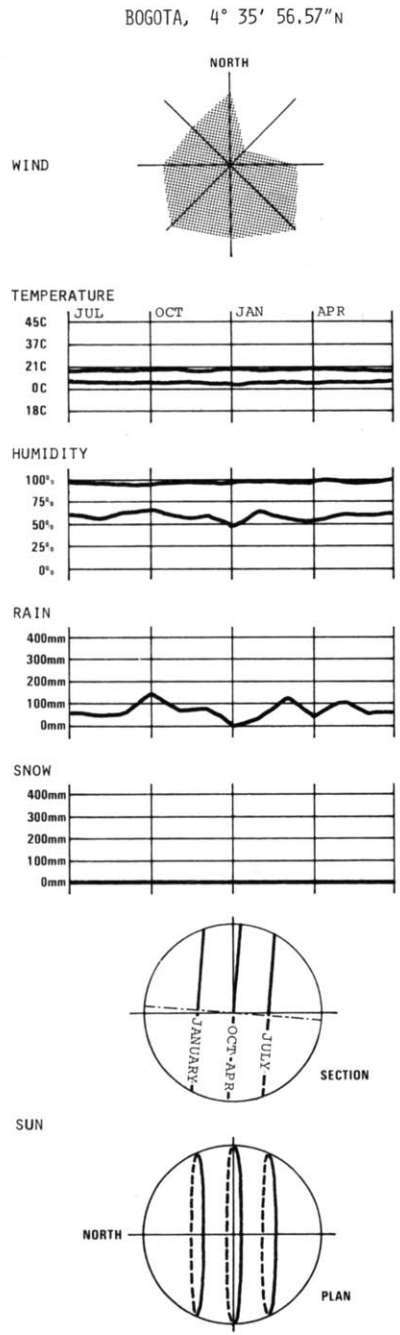
BOGOTA, COLOMBIA: Opposite page (top left) Plaza de Bolivar and Cathedral. The core of the city in which surroundings the National Government along with the Eclesiastic Command are concentrated, in the background the eastern hills.

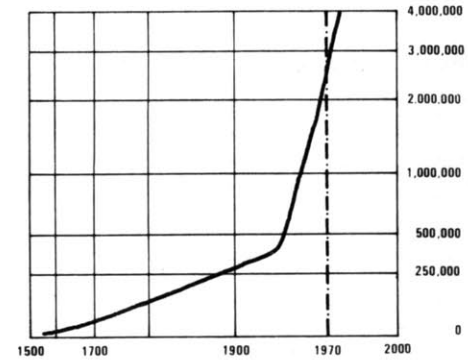
(top right) Public-Built multifamily walk-ups for middle income in the inner city.

(bottom left) "Tugurios" along the foothills in the southern part of the city.

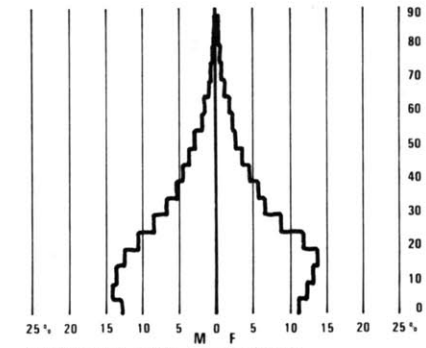
(bottom center) Prefabricated houses for very low incomes in the southern part.

(bottom right) High income houses in large lots in the northern part.

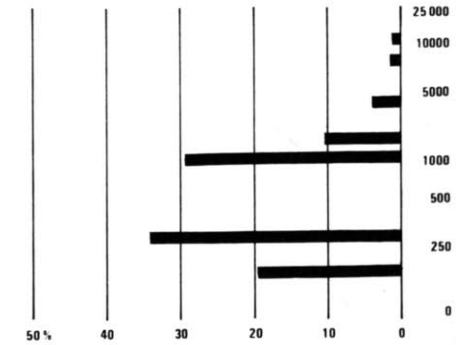




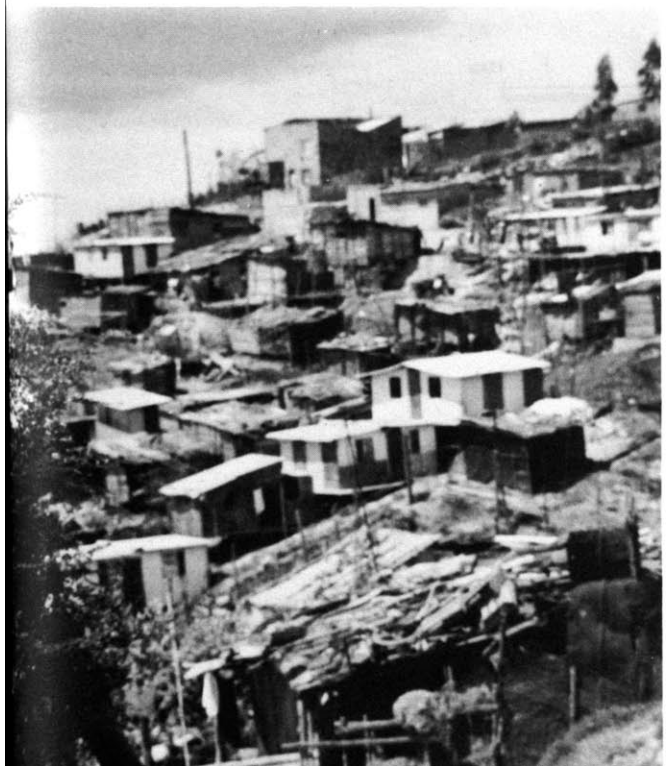
URBAN POPULATION GROWTH
horizontal: dates vertical: population

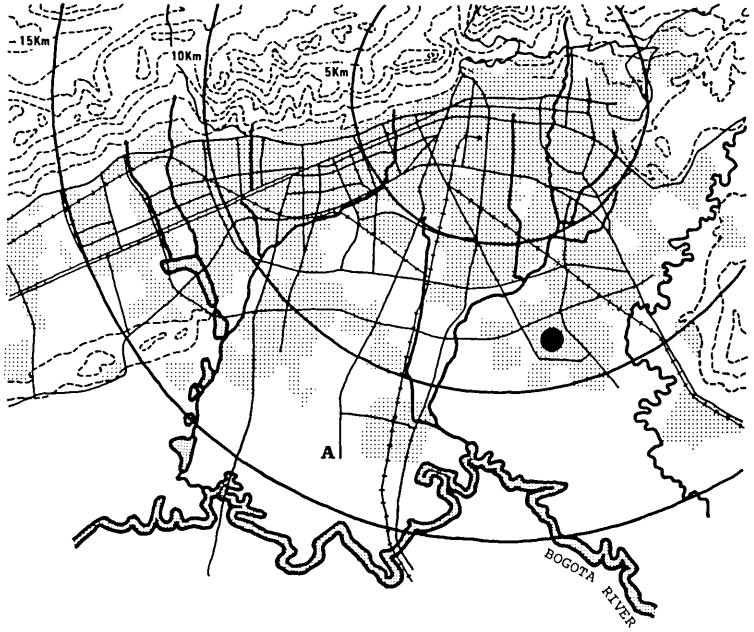


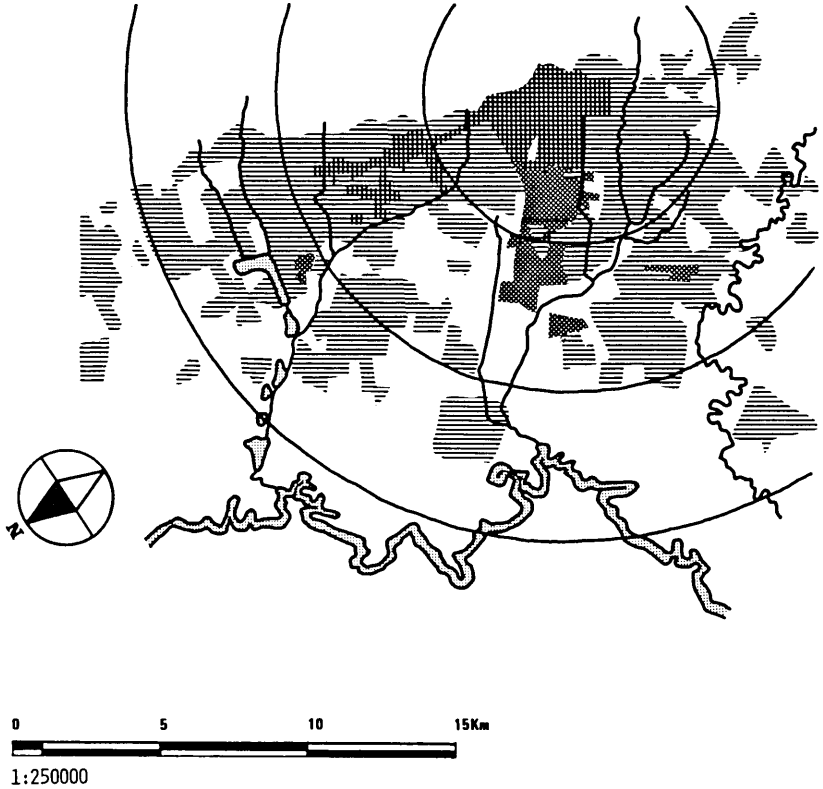
URBAN POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M females: F



URBAN ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars







KEY

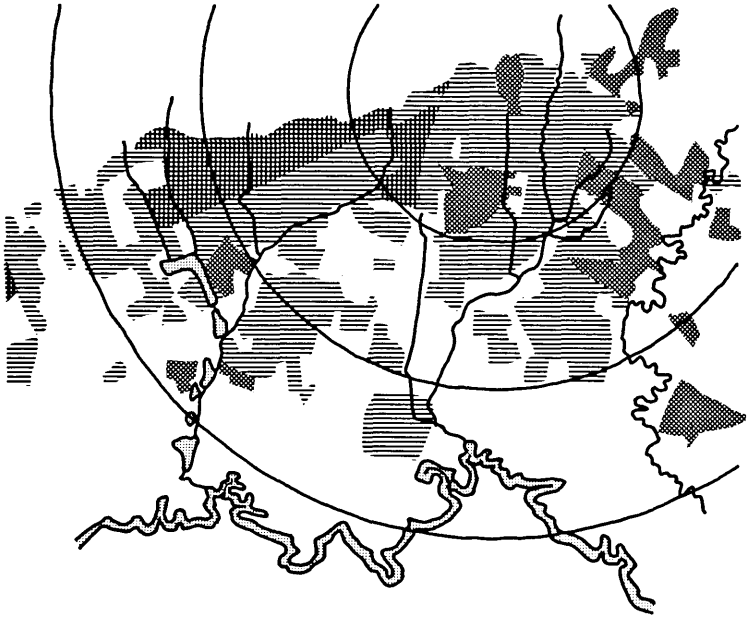
- A — Airport
- Primary Road
- Railroad
- Built-up Area
- CIUDAD KENNEDY

AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL

URBAN TOPOGRAPHY AND CIRCULATION

URBAN LAND USE PATTERN



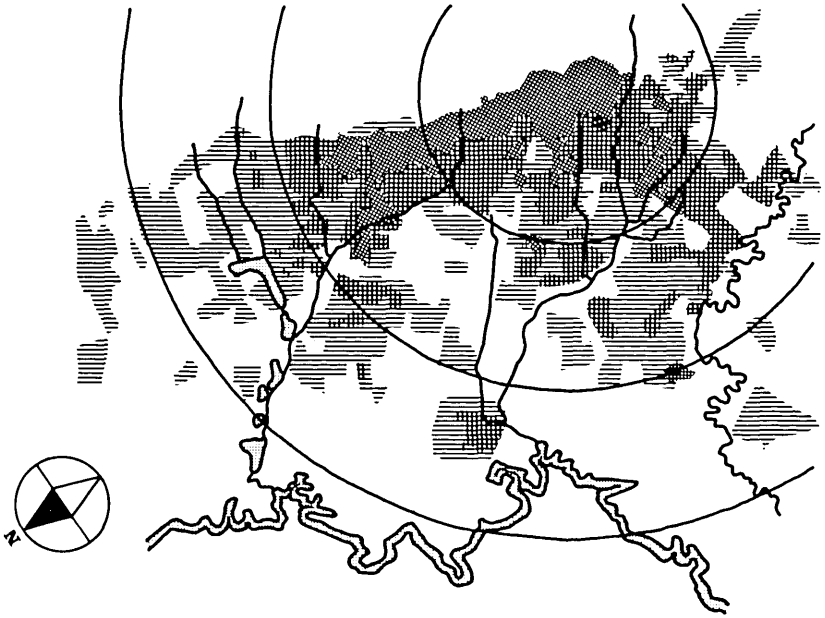
INCOMES

LOW

MEDIUM

HIGH

URBAN INCOME PATTERN



0 5 10 15Km

1:250000

DATES

1938

1958

1972

URBAN GROWTH PATTERN

URBAN CONTEXT SOURCES:

Climate: *(accurate) SERVICIO COLOMBIANO DE METEREOLOGIA, 1975.*

Urban Population Growth: *(accurate) BOGOTA, SU DESARROLLO Y PRESERVACION DEL MEDIO AMBIENTE, 1971. D.A.N.E., 1976.*

Urban Population Distribution: *(accurate) D.A.N.E., 1976.*

Urban Annual Income Distribution: *(accurate) BOGOTA, SU DESARROLLO Y PRESERVACION DEL MEDIO AMBIENTE.*

Photographs: *MOVIFOTO MEDELLIN. ARTURO ROBLEDO OCAMPO, 1976.*

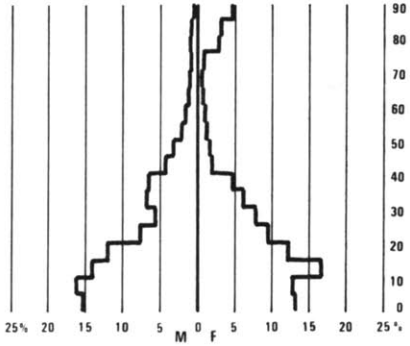
Urban Topography and Circulation: *(accurate) PLANO DE LA CIUDAD DE BOGOTA, INSTITUTO GEOGRAFICO "AGUSTIN CODAZZI", 1971.*

Urban Land Use Pattern: *UNIVERSIDAD NACIONAL, FACULTAD DE ARTES, 1975.*

Urban Income Pattern: *(accurate) PLANO ESTUDIO SOBRE FILTRACION EN BOGOTA, 1975.*

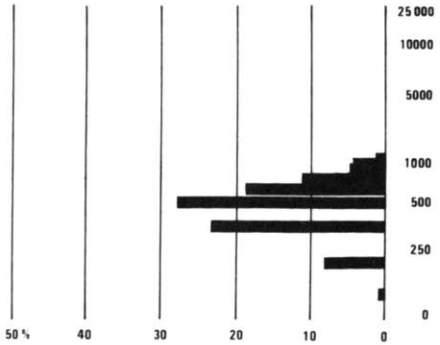
Urban Growth Pattern: *(accurate) BOGOTA, SU DESARROLLO Y PRESERVACION DEL MEDIO AMBIENTE, 1971. CONCEJO DE BOGOTA, 1960. EL FUTURO DE BOGOTA, 1974.*

General Information: *see Bibliography.*



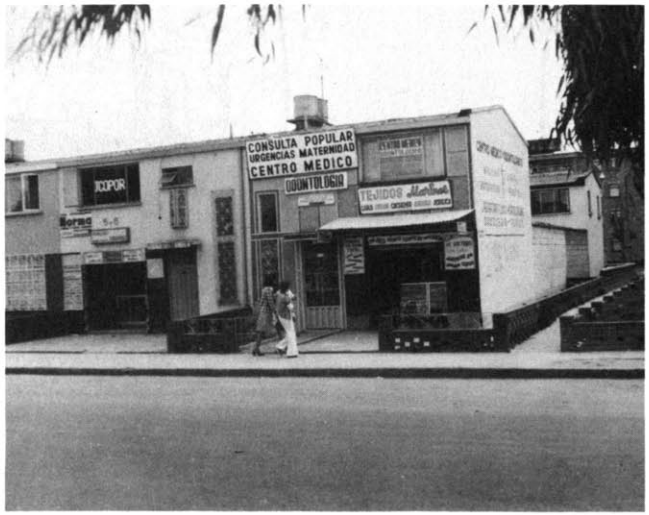
LOCALITY POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M females: F

POPULATION: In 1976, the total population of the great Ciudad Kennedy was estimated 600,000. 98.5% of the families have come from other parts of the city. There are 113 women for every 100 men and the predominance is more evident in the eldest groups.



LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars

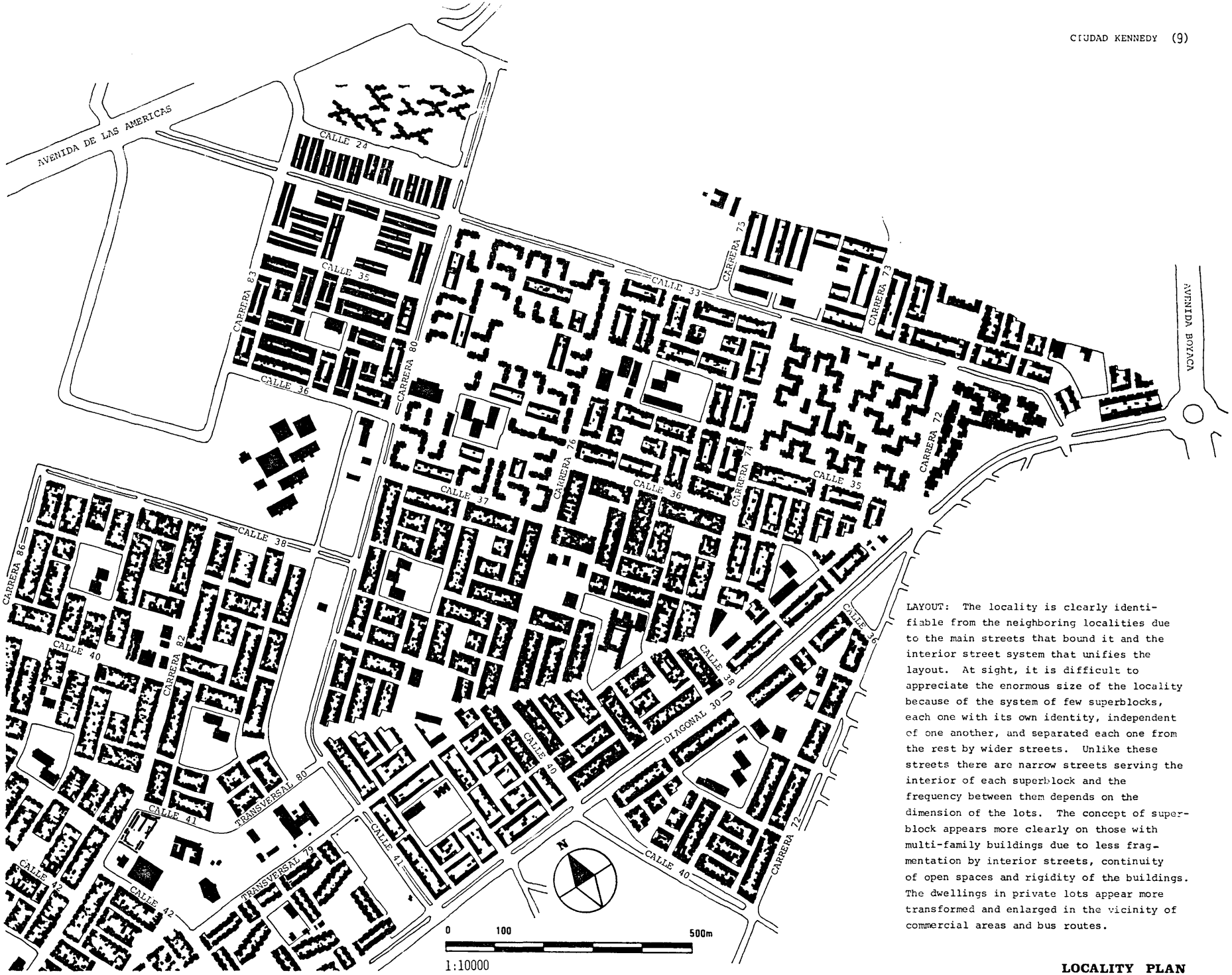
INCOME: The average household income is about U.S. $ 120. 25% of the families have monthly incomes less than U.S. $ 65, and 13% less than U.S. $ 15. 45% of the total population is able to work and 18% does not have a job.



CIUDAD KENNEDY, Bogota: (top left) Commercial street with small dwellings numberless adapted to variety of uses.

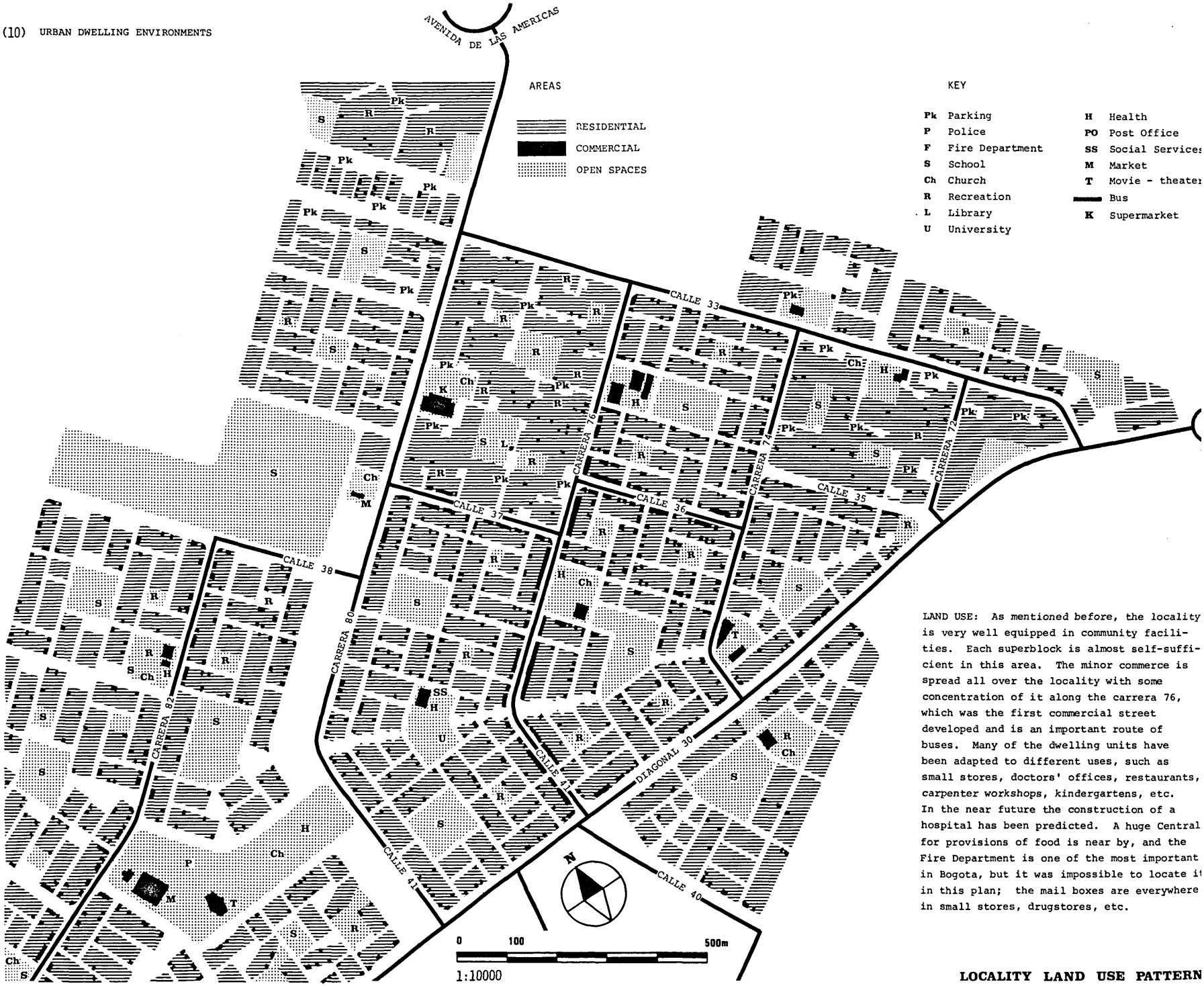
(top right) Commercial Street. The dwellings are transformed according to the economical well-being and private initiative of the people.

(bottom) Air view looking towards the West. In the foregroung the Experimental Plan is under construction. Farther, the Superblock 2.



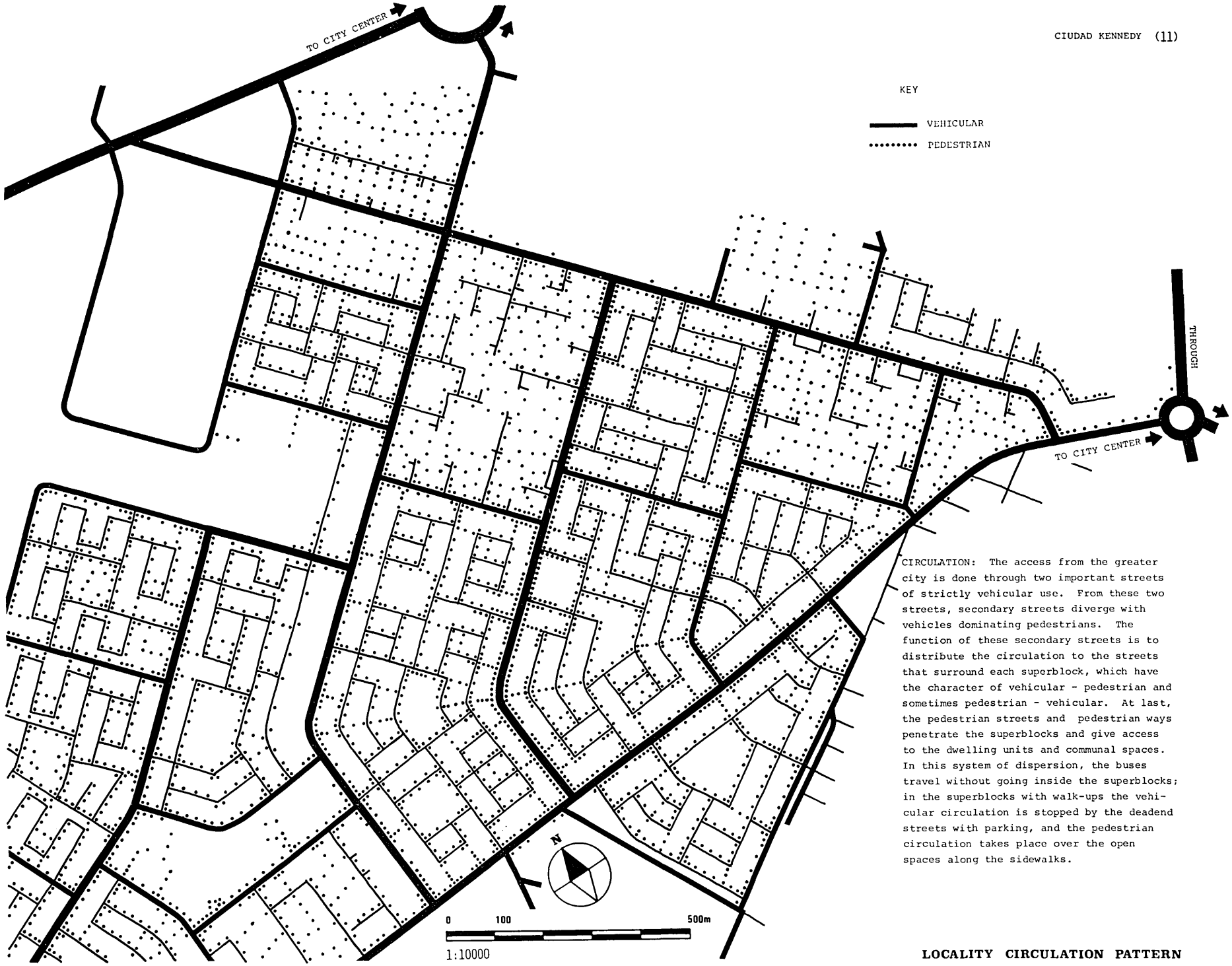
LAYOUT: The locality is clearly identifiable from the neighboring localities due to the main streets that bound it and the interior street system that unifies the layout. At sight, it is difficult to appreciate the enormous size of the locality because of the system of few superblocks, each one with its own identity, independent of one another, and separated each one from the rest by wider streets. Unlike these streets there are narrow streets serving the interior of each superblock and the frequency between them depends on the dimension of the lots. The concept of superblock appears more clearly on those with multi-family buildings due to less fragmentation by interior streets, continuity of open spaces and rigidity of the buildings. The dwellings in private lots appear more transformed and enlarged in the vicinity of commercial areas and bus routes.

LOCALITY PLAN



LAND USE: As mentioned before, the locality is very well equipped in community facilities. Each superblock is almost self-sufficient in this area. The minor commerce is spread all over the locality with some concentration of it along the carrera 76, which was the first commercial street developed and is an important route of buses. Many of the dwelling units have been adapted to different uses, such as small stores, doctors' offices, restaurants, carpenter workshops, kindergartens, etc. In the near future the construction of a hospital has been predicted. A huge Central for provisions of food is near by, and the Fire Department is one of the most important in Bogota, but it was impossible to locate it in this plan; the mail boxes are everywhere in small stores, drugstores, etc.

LOCALITY LAND USE PATTERN

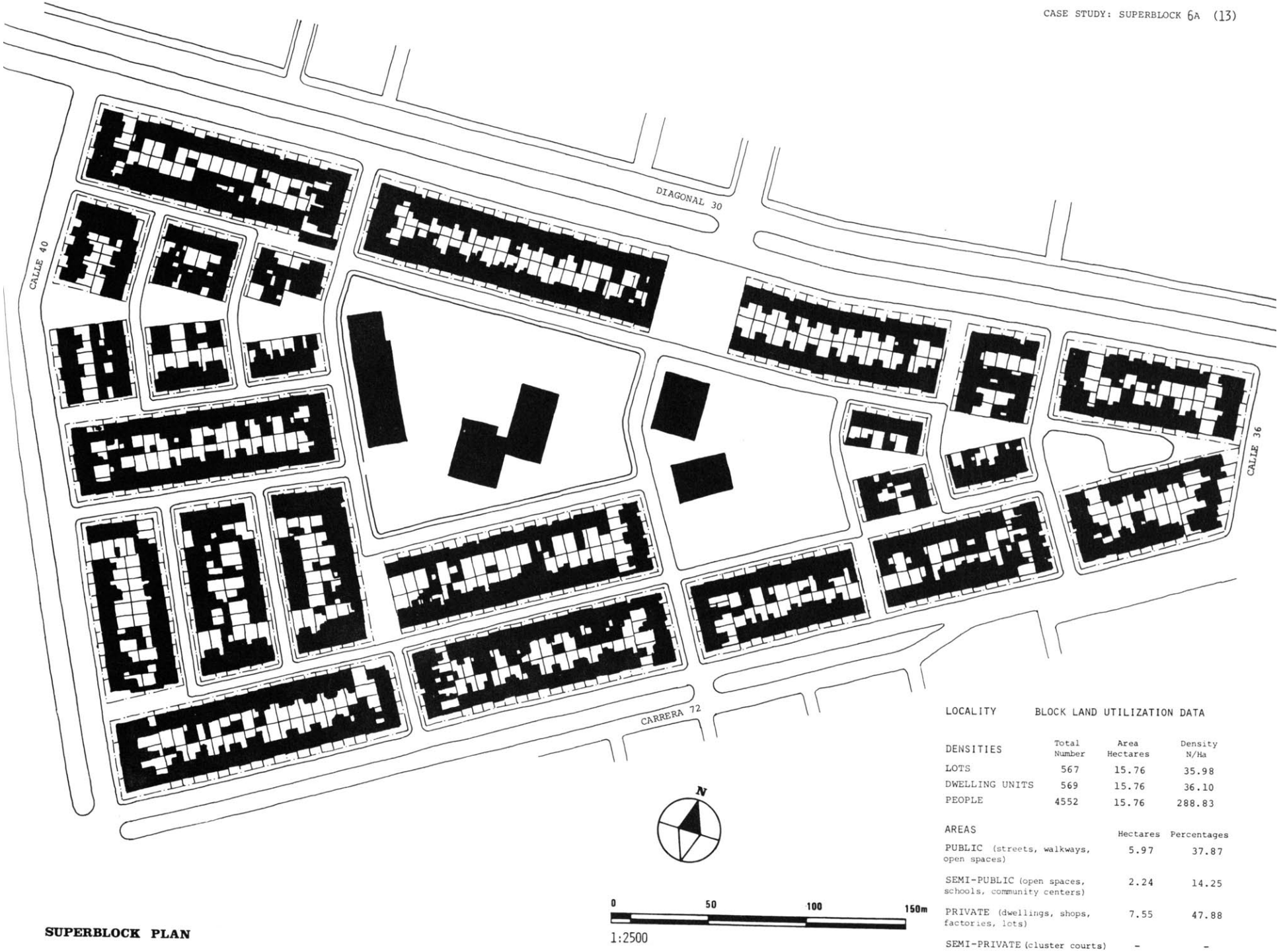


CIRCULATION: The access from the greater city is done through two important streets of strictly vehicular use. From these two streets, secondary streets diverge with vehicles dominating pedestrians. The function of these secondary streets is to distribute the circulation to the streets that surround each superblock, which have the character of vehicular - pedestrian and sometimes pedestrian - vehicular. At last, the pedestrian streets and pedestrian ways penetrate the superblocks and give access to the dwelling units and communal spaces. In this system of dispersion, the buses travel without going inside the superblocks; in the superblocks with walk-ups the vehicular circulation is stopped by the deadend streets with parking, and the pedestrian circulation takes place over the open spaces along the sidewalks.

LOCALITY CIRCULATION PATTERN

1:2500

SUPERBLOCK 6A AIR PHOTOGRAPH

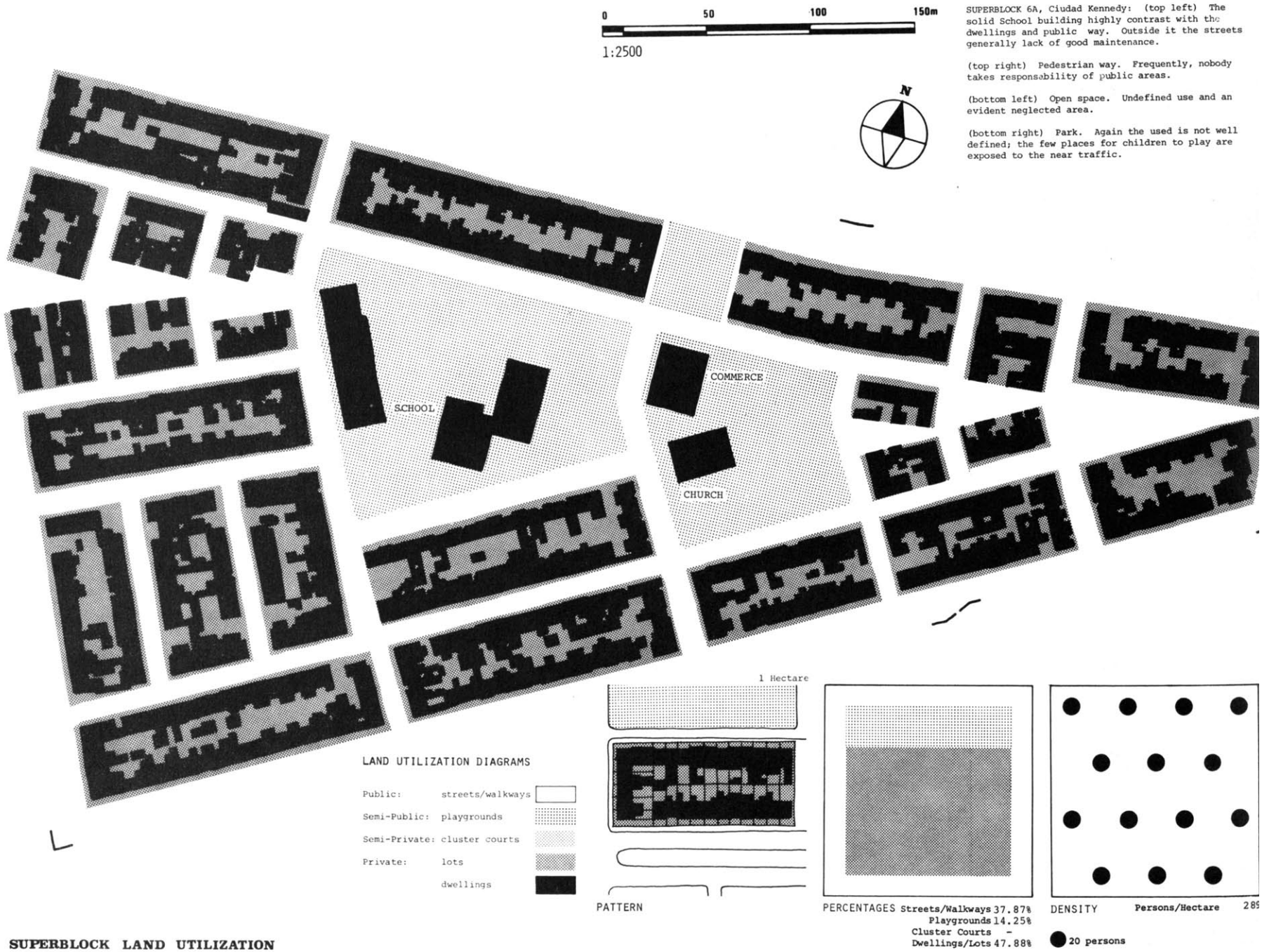


SUPERBLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	567	15.76	35.98
DWELLING UNITS	569	15.76	36.10
PEOPLE	4552	15.76	288.83

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	5.97	37.87
SEMI-PUBLIC (open spaces, schools, community centers)	2.24	14.25
PRIVATE (dwellings, shops, factories, lots)	7.55	47.88
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	15.76	100



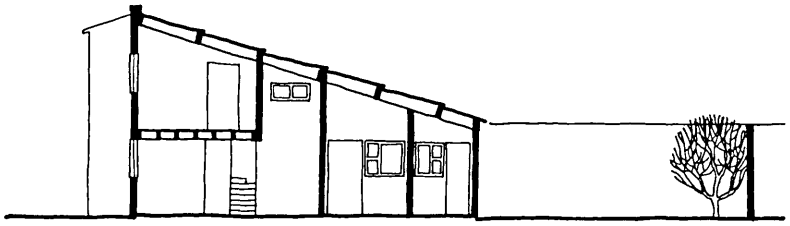
SUPERBLOCK 6A, Ciudad Kennedy: (top left) The solid School building highly contrast with the dwellings and public way. Outside it the streets generally lack of good maintenance.

(top right) Pedestrian way. Frequently, nobody takes responsability of public areas.

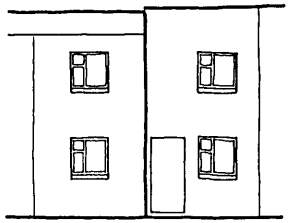
(bottom left) Open space. Undefined use and an evident neglected area.

(bottom right) Park. Again the used is not well defined; the few places for children to play are exposed to the near traffic.

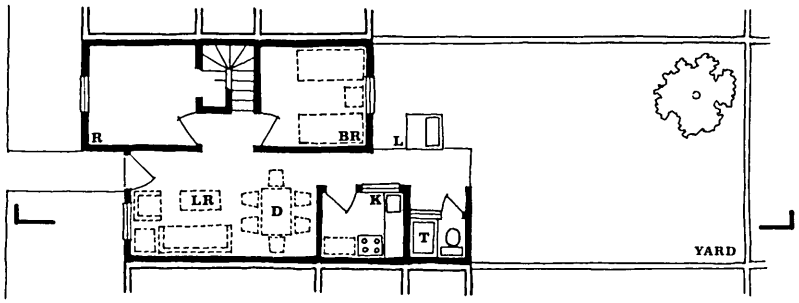
SUPERBLOCK LAND UTILIZATION

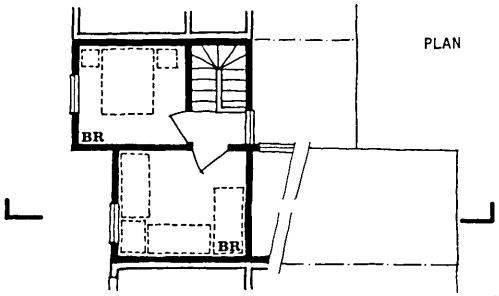


SECTION



ELEVATION





PLAN

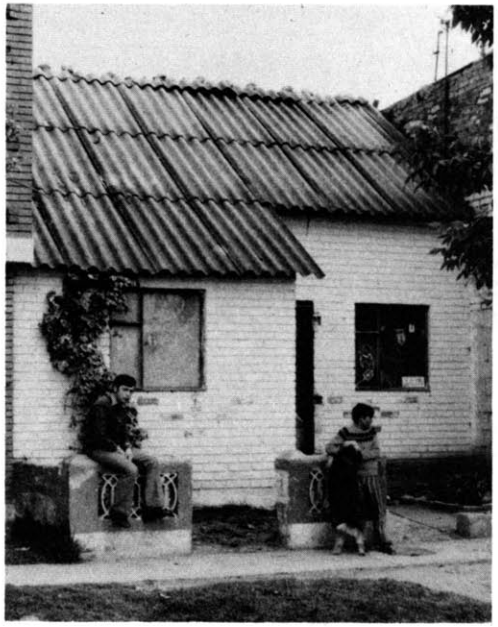
0 1 5 10m

1:200

KEY

LR Living Room
D Dining/Eating Area
BR Bedroom
K Kitchen/Cooking Area
T Toilet/Bathroom
L Laundry
R Room (multi-use)

TYPICAL DWELLING



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: HOUSE
area (sq m): 60.52
tenure: LEGAL OWNERSHIP

LAND/LOT
utilization: PRIVATE
area (sq m): 120
tenure: LEGAL OWNERSHIP

DWELLING
location: PERIPHERY
type: ROW/GROUPED
number of floors: 1 PLUS MEZZANINE
utilization: FAMILY
physical state: BAD

DWELLING DEVELOPMENT
mode: INCREMENTAL
developer: PRIVATE
builder: SELF-HELP
construction type: MASONRY-WOOD
year of construction: 1963

MATERIALS
foundation: STONE- CONCRETE
floors: WOOD
walls: RUBBLE MASONRY
roof: ASBESTOS-CEMENT

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 6
other: BACKYARD

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: CUNDINAMARCA
place of birth: FACATATIVA, CUNDINAMARCA
education level: PRIMARY SCHOOL

NUMBER OF USERS
married: 3
single: 6
children: 4
total: 14

MIGRATION PATTERN
number of moves: NONE
rural - urban: -
urban - urban: -
urban - rural: -
why came to urban area: -

GENERAL: ECONOMIC
user's income group: LOW
employment: CRAFTMANSHIP, MECHANIC
distance to work: 10 KM.
mode of travel: BUS

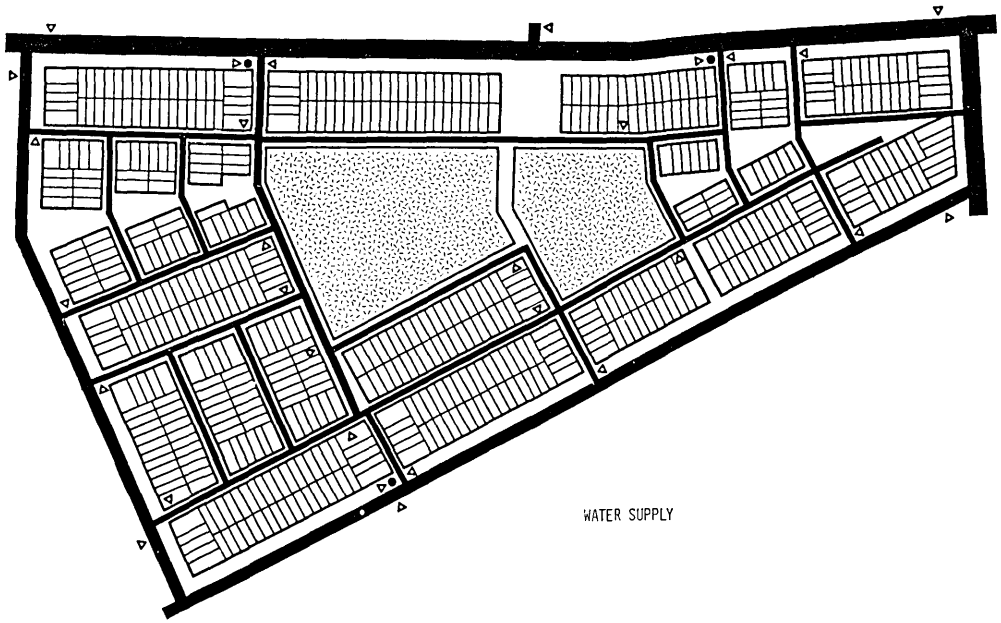
COSTS
dwelling unit: U.S. $ 2,600
land - market value: N.A.

DWELLING UNIT PAYMENTS
financing: PRIVATE/PUBLIC FINANCING
rent/mortgage: U.S. $ 2.5
% income for rent/mortgage: 56%

SUPERBLOCK 6A, Ciudad Kennedy: (left) Typical dwelling of self-help development. It maintains the original condition of construction.

(center) The private property is well defined. The people take the resort of small business to improve their resources.

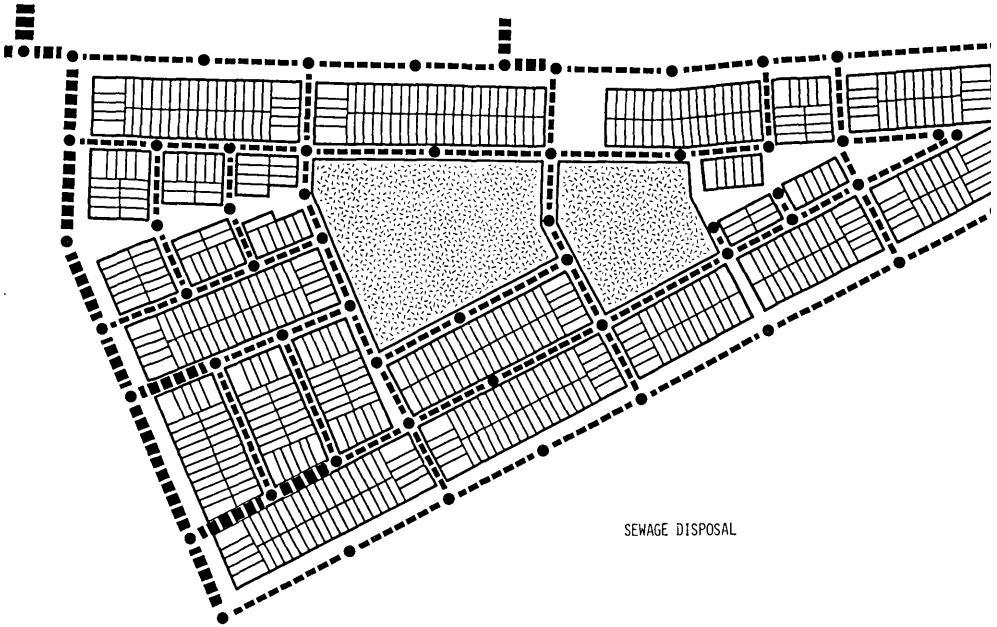
(right) Small houses are subdivided and even tiny spaces are rented to enlarge the incomes of their owners.



WATER SUPPLY

KEY

●	FIRE HYDRANTS	1.5 UNITS
△	VALVES	27 UNITS
▬	3" PIPES	2327 METERS
▬	4" PIPES	311 METERS
▬	6" PIPES	971 METERS
▬	12" PIPES	638 METERS

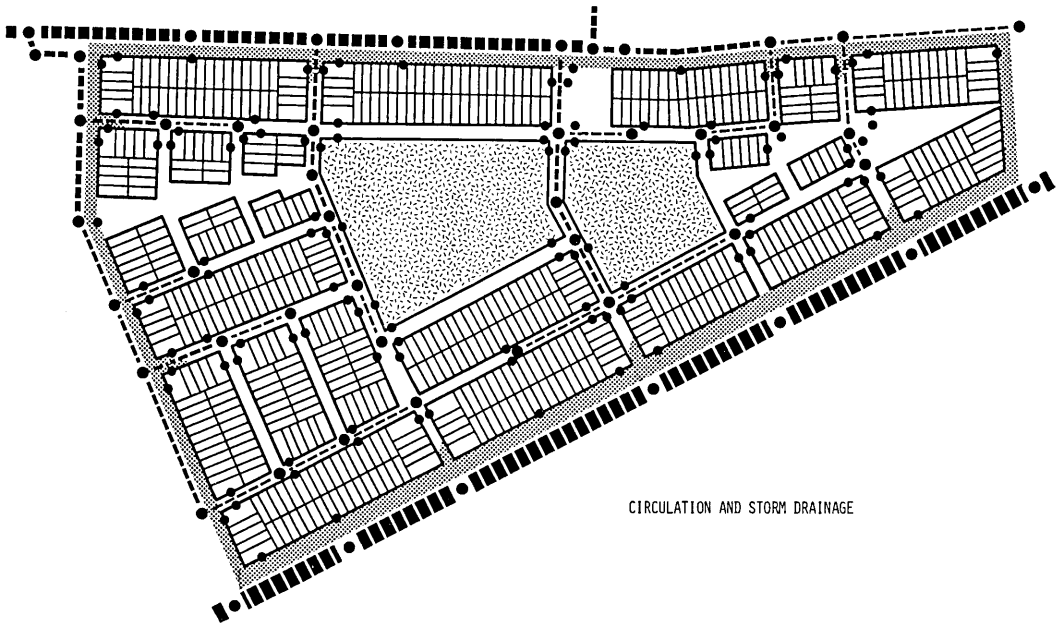


SEWAGE DISPOSAL

KEY

●	MANHOLES	57 UNITS
▬	8" PIPES	3764 METERS
▬	10" PIPES	575 METERS
▬	MAIN PIPE	-----

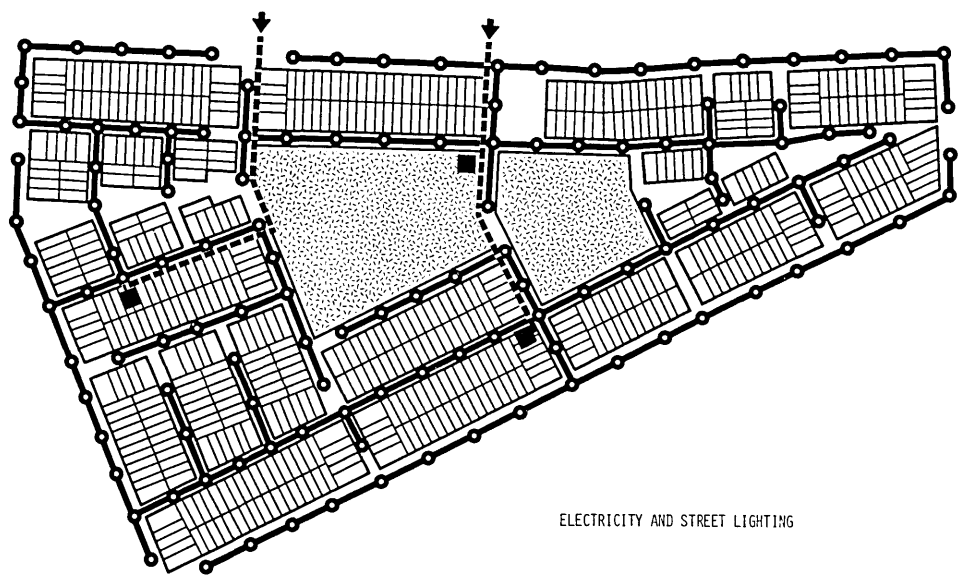
SUPERBLOCK 6A UTILITY SERVICES



CIRCULATION AND STORM DRAINAGE

KEY

MANHOLES	40 UNITS
INLETS	110 UNITS
10"- 14" PIPES	853 METERS
16"- 24" PIPES	752 METERS
27" PIPES	325 METERS
47"- 51" PIPES	195 METERS
MAIN PIPE	----
FINISHED PAVING	



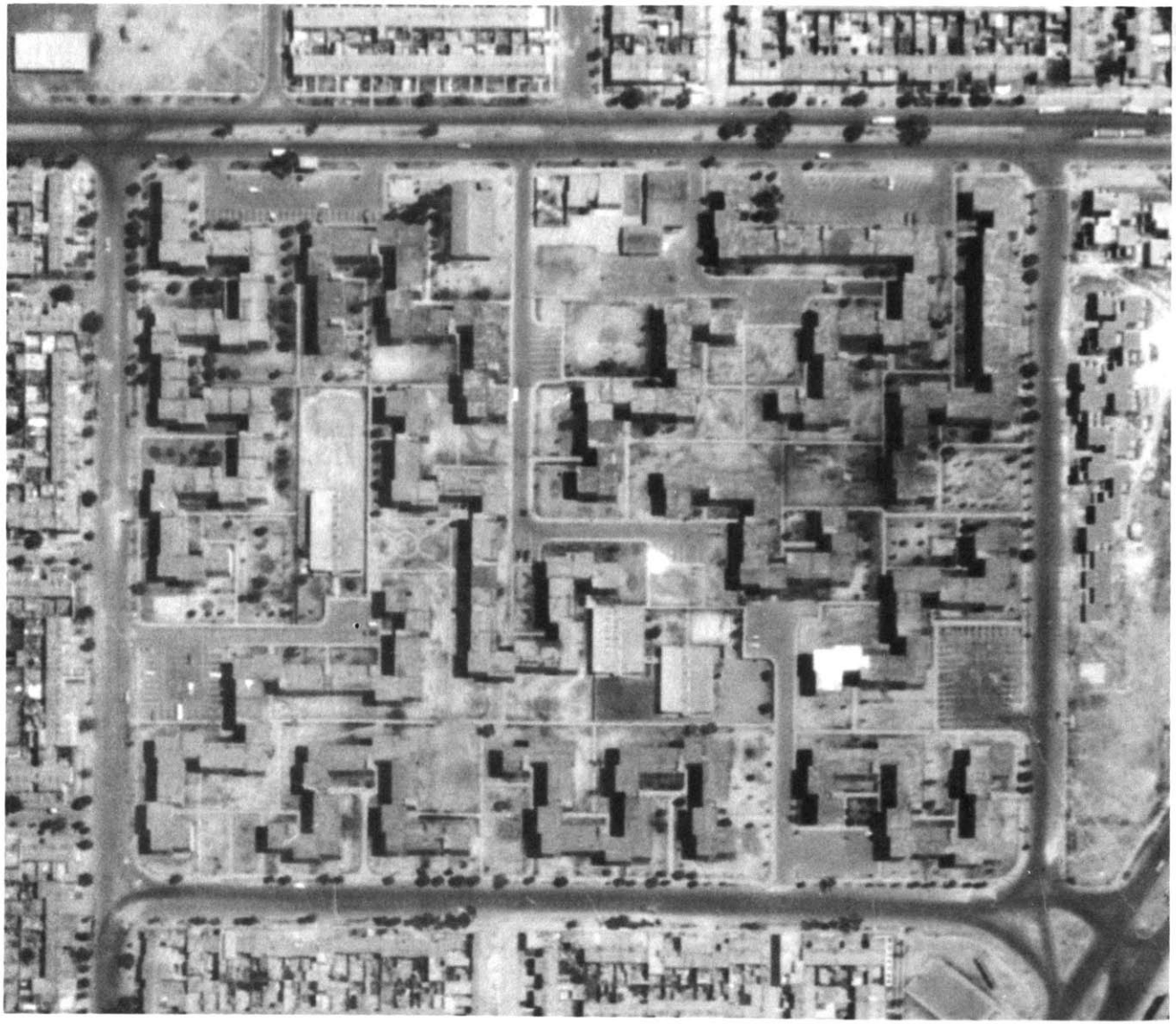
ELECTRICITY AND STREET LIGHTING

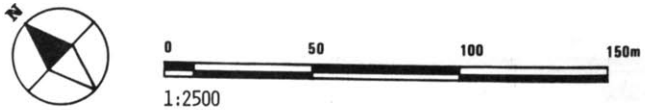
KEY

TRANSFORMERS	3 UNITS
POLES WITH LAMPS	128 UNITS
LOW TENSION CABLES	3789 METERS
HIGH TENSION CABLES	420 METERS
CITY NETWORK CONNECTIONS	

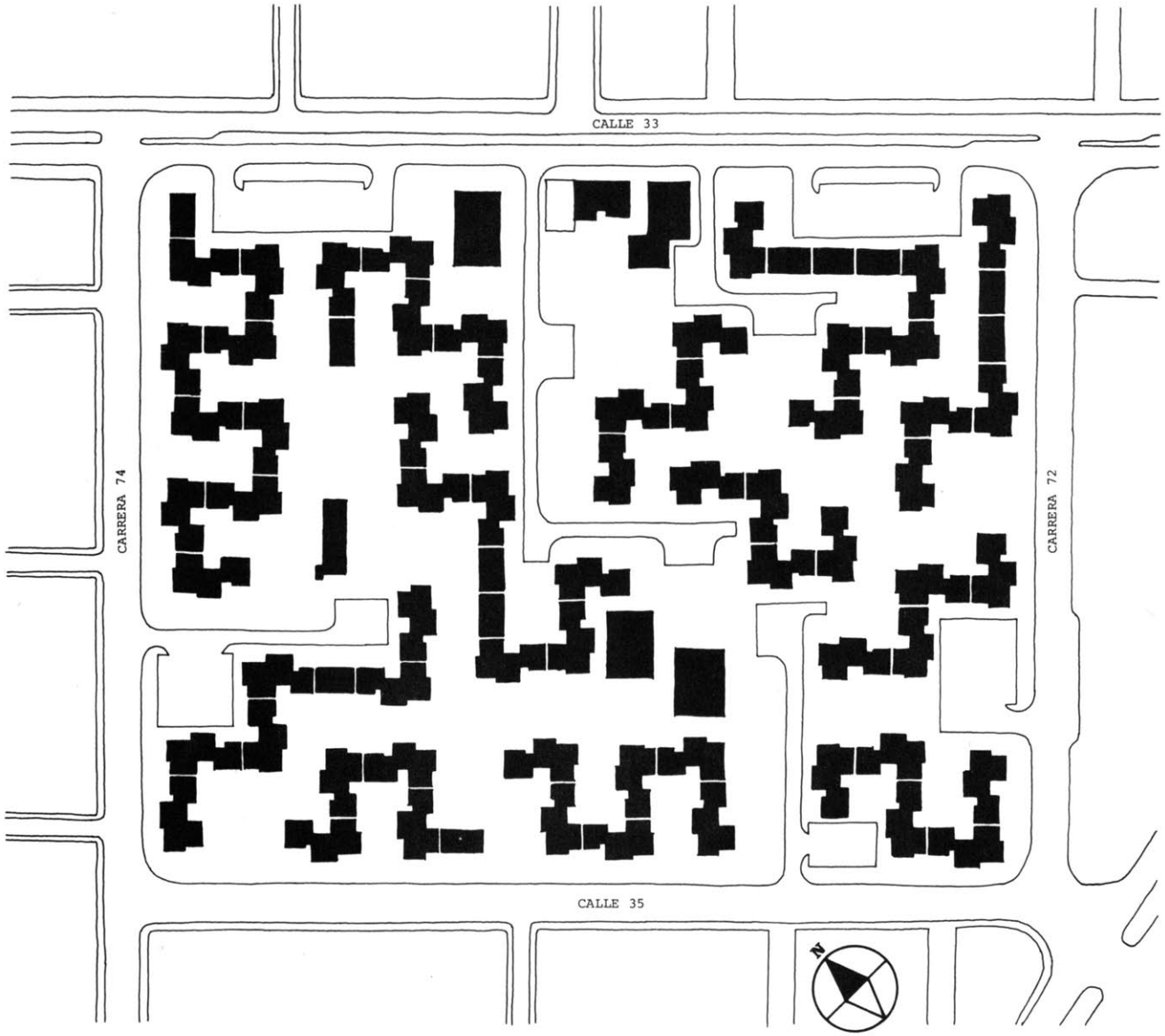
0 50 250m

1:5000





SUPERBLOCK 2 AIR PHOTOGRAPH



0 50 100 150m

1:2500

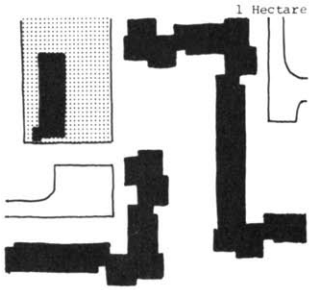
SUPERBLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	73	9.98	7.31
DWELLING UNITS	1069	9.98	107.11
PEOPLE	6900	9.98	691.38

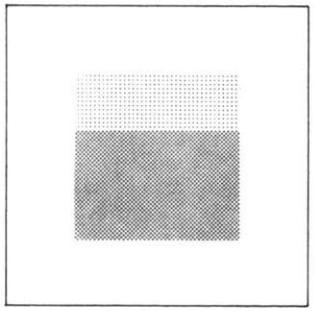
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	6.94	69.54
SEMI-PUBLIC (open spaces, schools, community centers)	0.99	9.94
PRIVATE (dwellings, shops, factories, lots)	7.05	20.52
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	9.98	100

LAND UTILIZATION DIAGRAMS



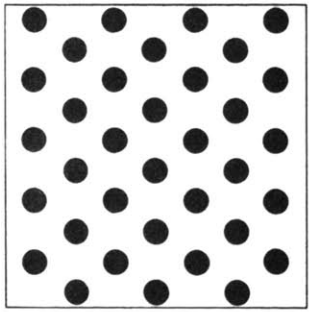
PATTERN

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	



PERCENTAGES

Streets/Walkways	69.54%
Playgrounds	9.94%
Cluster Courts	-
Dwellings/Lots	20.52%



DENSITY Persons/Hectare 692

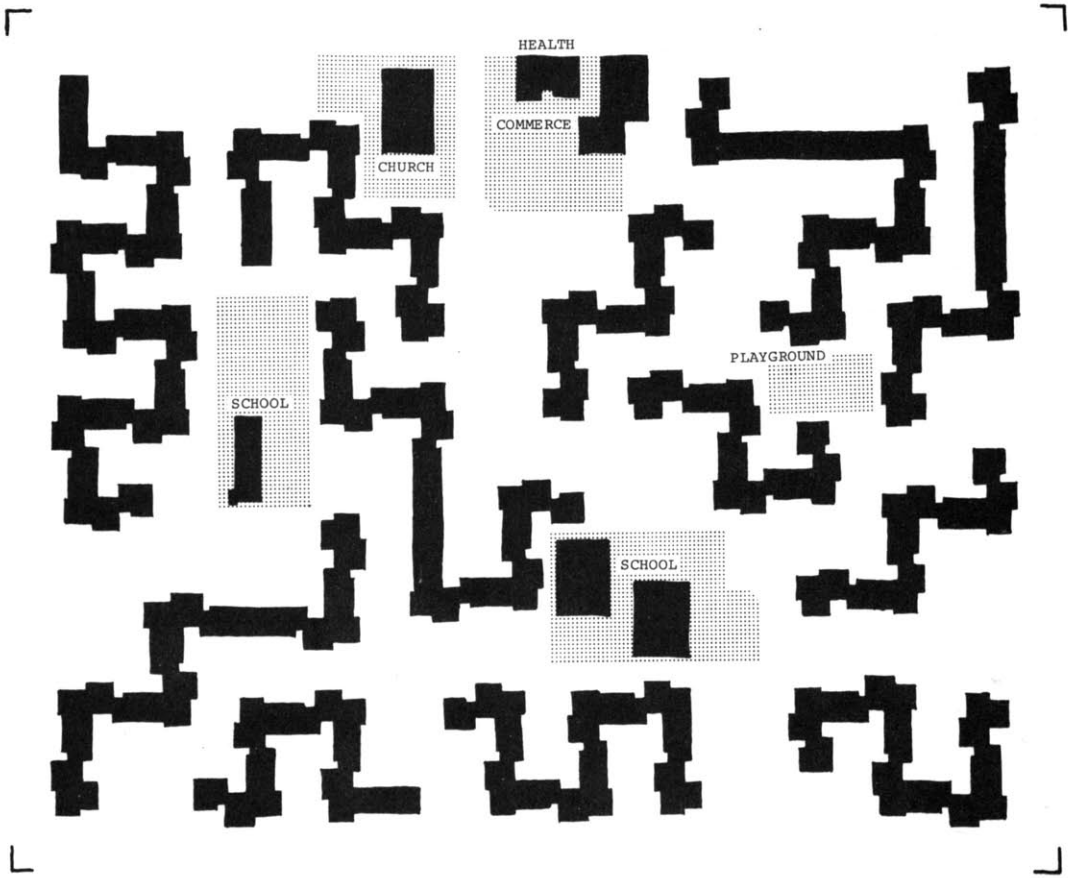
● 20 persons

SUPERBLOCK 2, Ciudad Kennedy: (top left) Playgroun These facilities are not completely utilized althoug the infantile population is considerable.

(top right) Commercial Area. The character of uses is not clear. The users try to define their surrounding yards.

(bottom left) Parking space. The initial destination of spaces is changed according to the spontaneity and necessities of the users.

(bottom right) Collector street. In some places the streets are overdesigned and therefore wasted.



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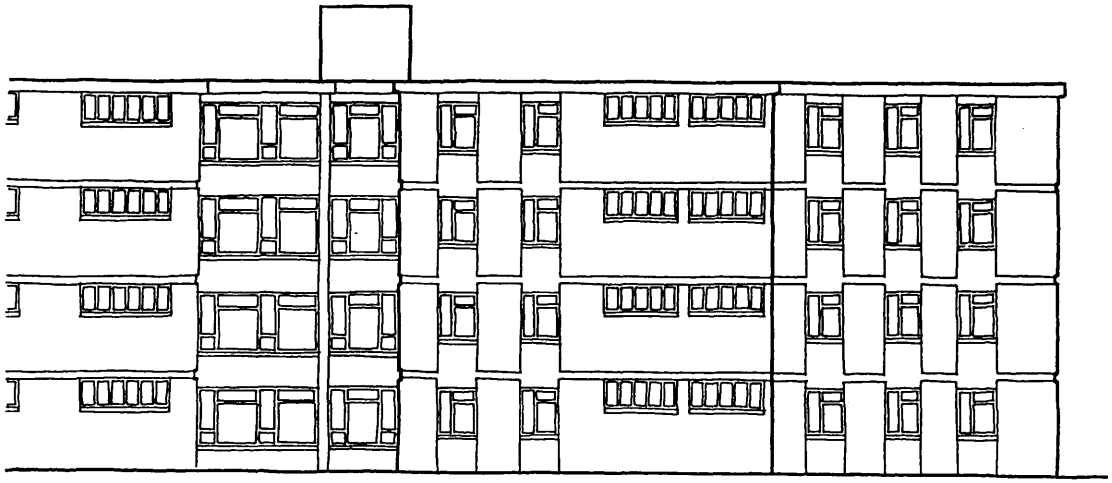
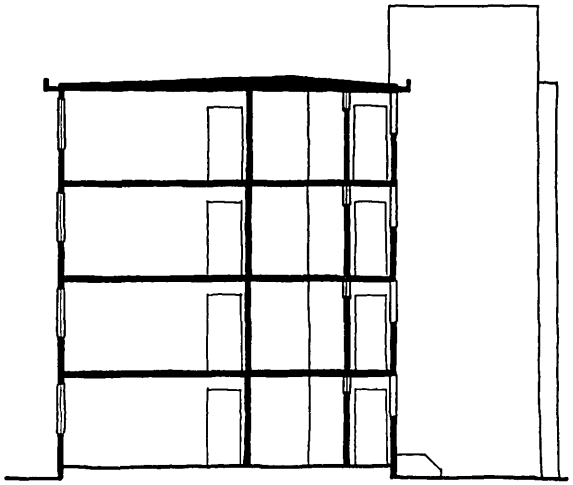
SUPERBLOCK LAND UTILIZATION

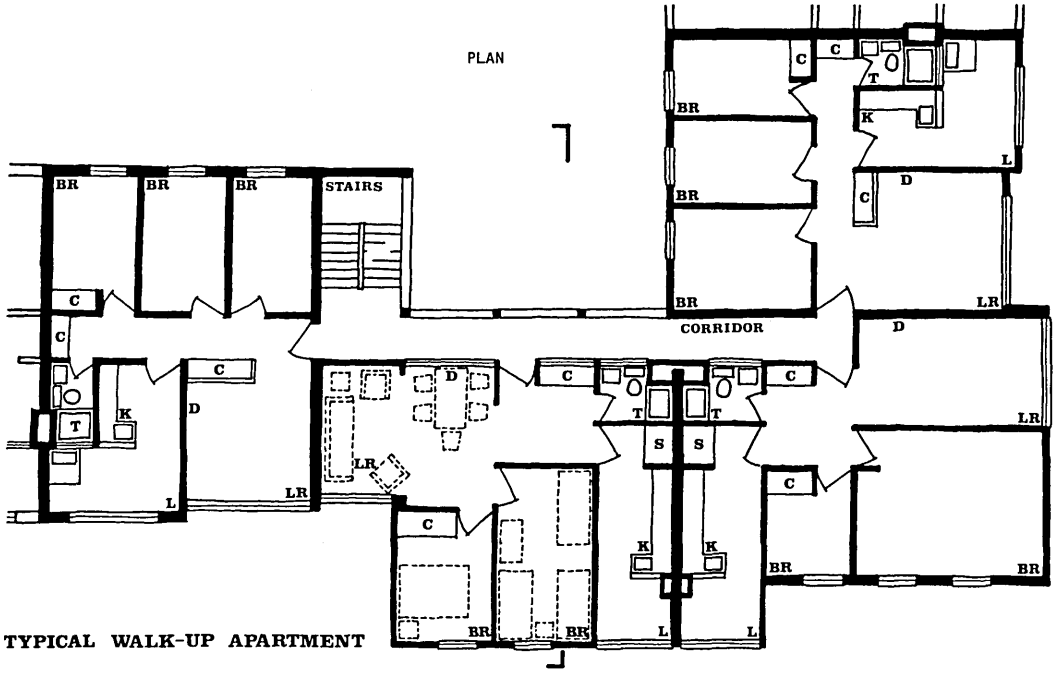


SECTION



ELEVATION

PLAN



TYPICAL WALK-UP APARTMENT

KEY

LR	Living Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Laundry
C	Closet
S	Storage

0 1 5 10m

1:200

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: APARTMENT
area (sq m): 63.51
tenure: LEGAL RENTAL

LAND/LOT
utilization: PRIVATE
area (sq m): 295.6
tenure: LEGAL OWNERSHIP

DWELLING
location: PERIPHERY
type: WALK-UP
number of floors: 4
utilization: MULTIPLE: FAMILY
physical state: GOOD

DWELLING DEVELOPMENT
mode: INSTANT
developer: PUBLIC
builder: LARGER CONTRACTOR
construction type: MASONRY CONCRETE
year of construction: 1966

MATERIALS
foundation: REINFORCED CONCRETE FOR BASE OF COLUMNS
floors: CONCRETE
walls: BRICK
roof: ASPHALT ON POURED CONCRETE

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 3
other: WASHING AND DRYING PLACE

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: BOYACA
place of birth: SATIVA, BOYACA
education level: ACCOUNTANT

NUMBER OF USERS
married: 2
single: 2
children: 3
total: 7

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: 1967
urban - rural: -
why came to urban area: TO EDUCATE CHILDREN

GENERAL: ECONOMIC
user's income group: MODERATE
employment: TRADE
distance to work: 15 KM.
mode of travel: BUS

COSTS
dwelling unit: U.S. $ 4,000
land - market value: N.A.

DWELLING UNIT PAYMENTS
financing: PRIVATE
rent/mortgage: U.S. $ 15.22
% income for rent/mortgage: 20%

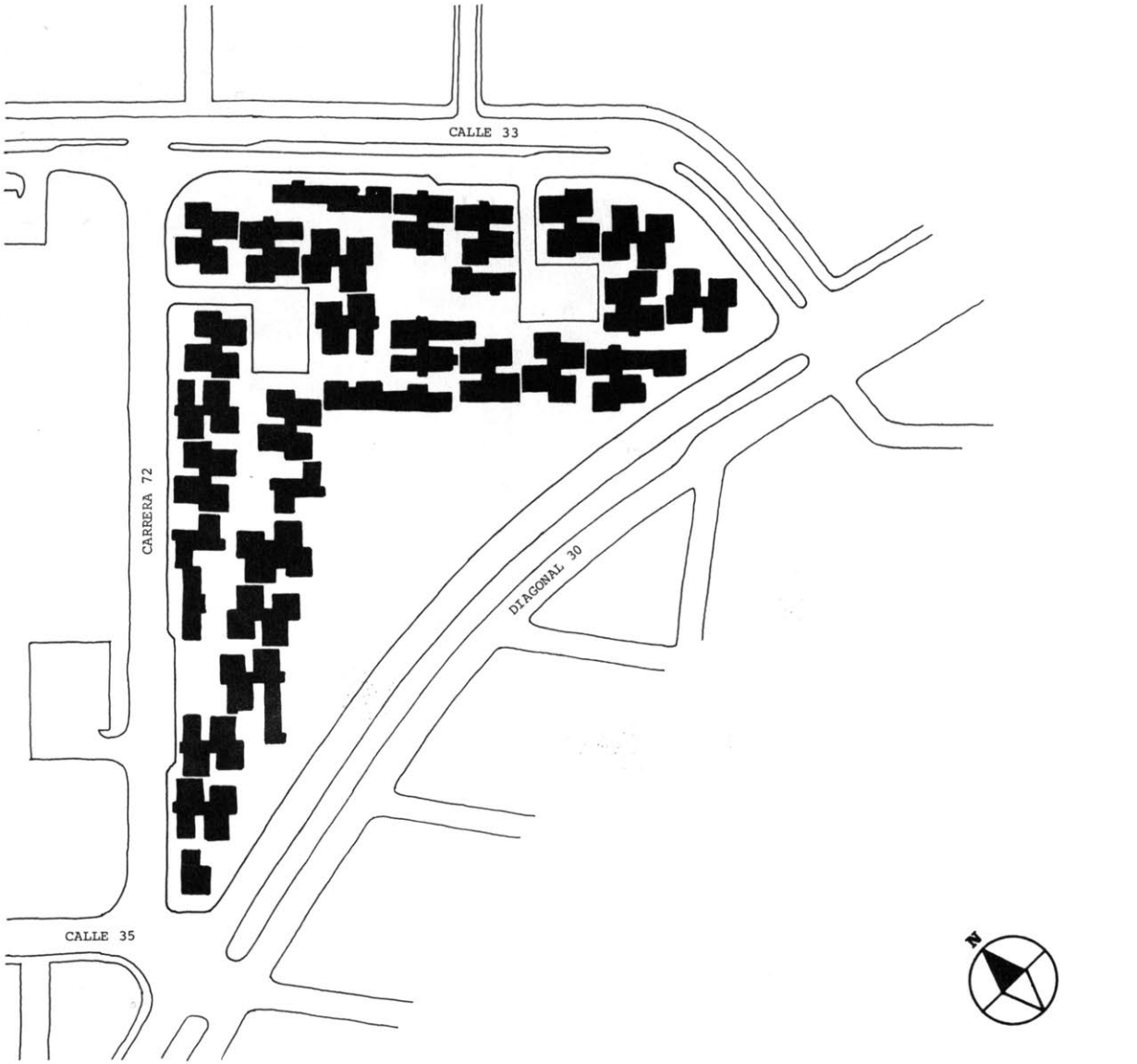
SUPERBLOCK 2, Ciudad Kennedy: (left) Typical walk-up. The type of construction and the inner rigidity of this kind of projects do not allow the people to make visible changes.

(center) Building entrance. There is no physical control for the common property.

(right) Social and service façade. Here is notorious the lack of privacy from the outside to the inside of the apartments on the ground floor.

1:2500

EXPERIMENTAL PLAN SUPERBLOCK AIR PHOTOGRAPH



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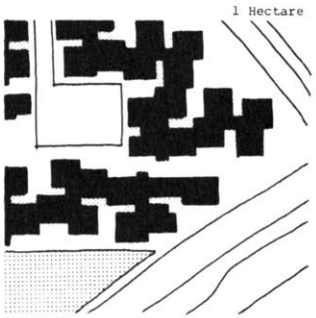
SUPERBLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	28	4.25	6.59
DWELLING UNITS	278	4.25	65.41
PEOPLE	1800	4.25	423.53

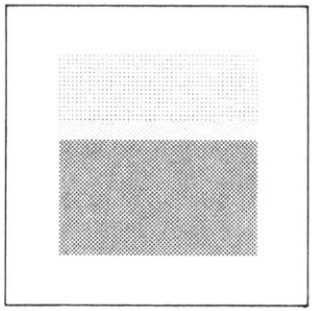
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	2.4	56.45
SEMI-PUBLIC (open spaces, schools, community centers)	0.65	15.26
PRIVATE (dwellings, shops, factories, lots)	0.11	25.72
SEMI-PRIVATE (cluster courts)	1.9	2.57
TOTAL	4.25	100

LAND UTILIZATION DIAGRAMS

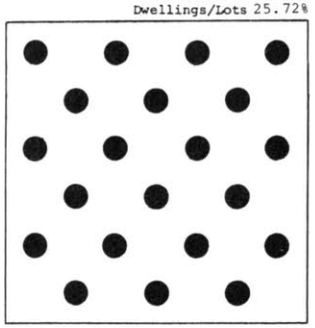


PATTERN

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	



PERCENTAGES Streets/Walkways 56.45%
Playgrounds 15.26%
Cluster Courts 2.57%
Dwellings/Lots 25.72%



DENSITY Persons/Hectare 422

● 20 persons

EXPERIMENTAL PLAN, Ciudad Kennedy: (top left) Minor arterial. Large streets seem to be lonely. The design is directed to a final stage of development.

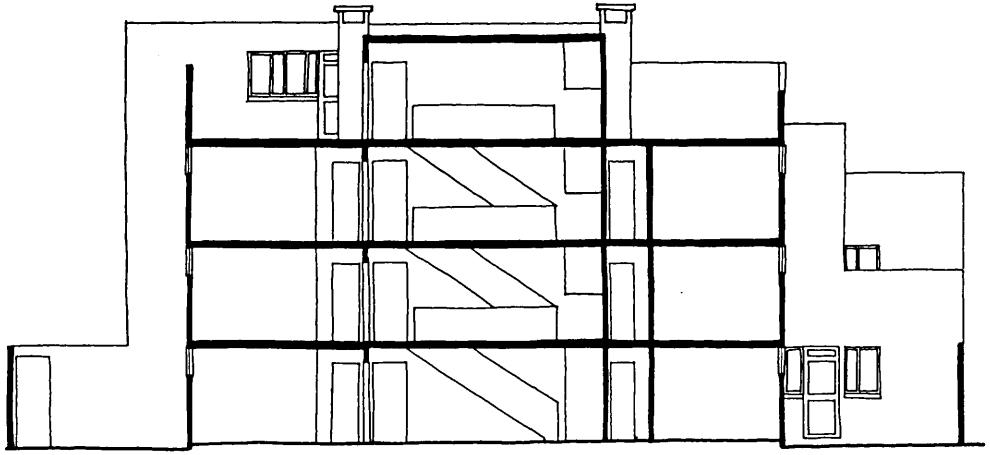
(top right) Collector street. Even though the target income is higher and demands more amplitude the results do not reflect the requirements for public areas.

(bottom left) The public area confusedly penetrates into the more private spaces.

(bottom right) Parking entrance. The magnitude and number of vehicular spaces exceed their final utilization.

1:2500

SUPERBLOCK LAND UTILIZATION



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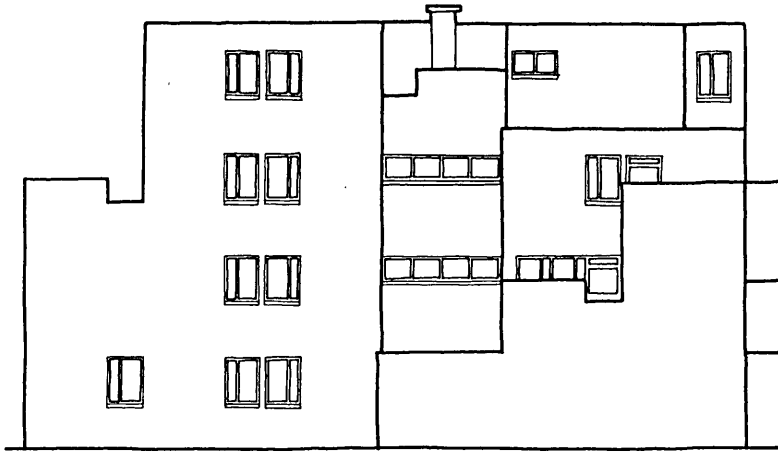
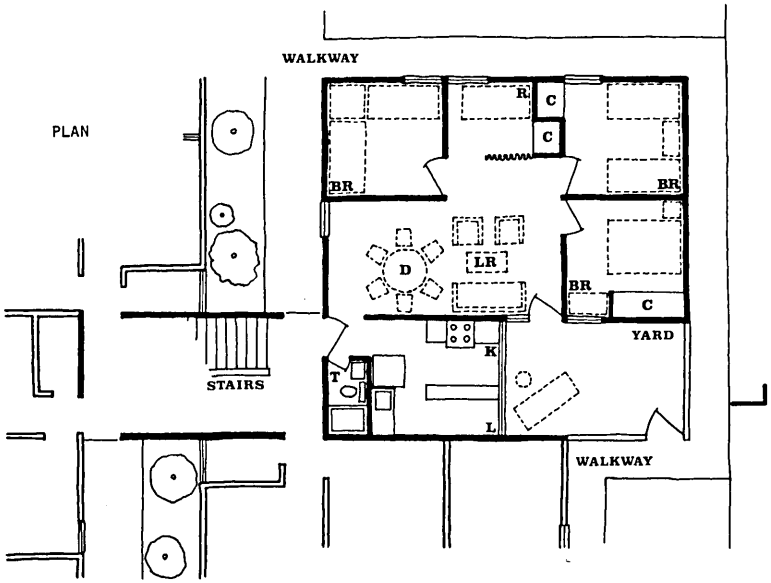
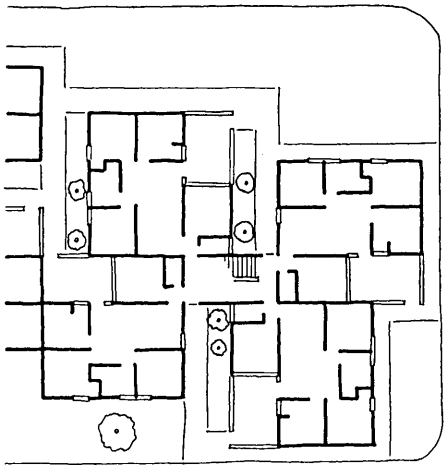


ELEVATION

PLAN



TYPICAL GROUND FLOOR



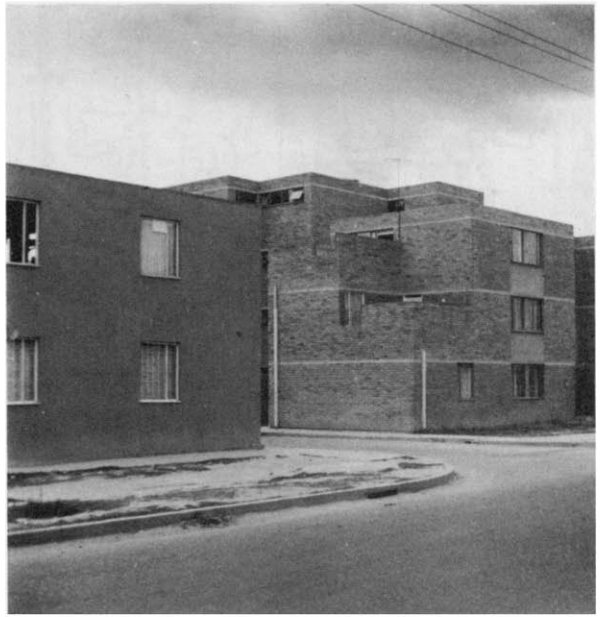
0 1 5 10m

1:200

KEY

- **LR** Living Room
- **D** Dining/Eating Area
- **BR** Bedroom
- **K** Kitchen/Cooking Area
- **T** Toilet/Bathroom
- **L** Laundry
- **C** Closet
- **R** Room (multi-use)

TYPICAL WALK-UP APARTMENT



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: APARTMENT
area (sq m): 92.16
tenure: LEGAL OWNERSHIP

LAND/LOT
utilization: PRIVATE
area (sq m): 368.64
tenure: LEGAL OWNERSHIP

DWELLING
location: PERIPHERY
type: WALK-UP/GROUPED
number of floors: 4
utilization: MULTIPLE: FAMILY
physical state: GOOD

DWELLING DEVELOPMENT
mode: INSTANT
developer: PUBLIC
builder: LARGE CONTRACTOR
construction type: MASONRY CONCRETE
year of construction: 1971

MATERIALS
foundation: REINFORCED CONCRETE FOR BASE OF COLUMNS
floors: PREFABRICATED CONCRETE
walls: RUBBLE MASONRY
roof: ASPHALT ON PREFABRICATED SLAB

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 3
other: WASHING AND DRYING PLACE, YARD

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: WESTERN PLAINS
place of birth: LUCHIA, CASANARE
education level: 3 YEARS UNIVERSITY

NUMBER OF USERS
married: 2
single: -
children: 4
total: 6

MIGRATION PATTERN
number of moves: NONE
rural - urban: -
urban - urban: -
urban - rural: -
why came to urban area: -

GENERAL: ECONOMIC
user's income group: MIDDLE
employment: OFFICIAL
distance to work: 8 KM.
mode of travel: BUS

COSTS
dwelling unit: U.S. $ 5,300
land - market value: N.A.

DWELLING UNIT PAYMENTS
financing: PRIVATE/PUBLIC FINANCED
rent/mortgage: U.S. $ 41
% income for rent/mortgage: 46%

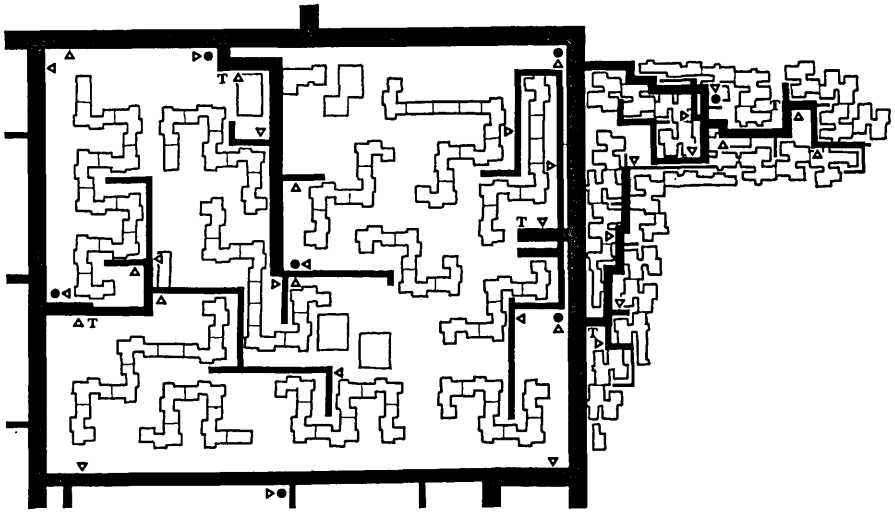
EXPERIMENTAL PLAN, Ciudad Kennedy: (left) The different methods of construction used here are reflected in the exterior finish. The criteria of relationship with the ground level is the same for all the apartments in all the floors.

(center) Typical entrance to the buildings through a physical control constituted by architectural volumes. This area could be finally defined as semiprivate.

(right) Group of buildings. Not all the buildings are the same high. Larger apartments are located on the ground floor and the retrocession of volumes occur through private terraces.

CASE STUDIES SOURCES:

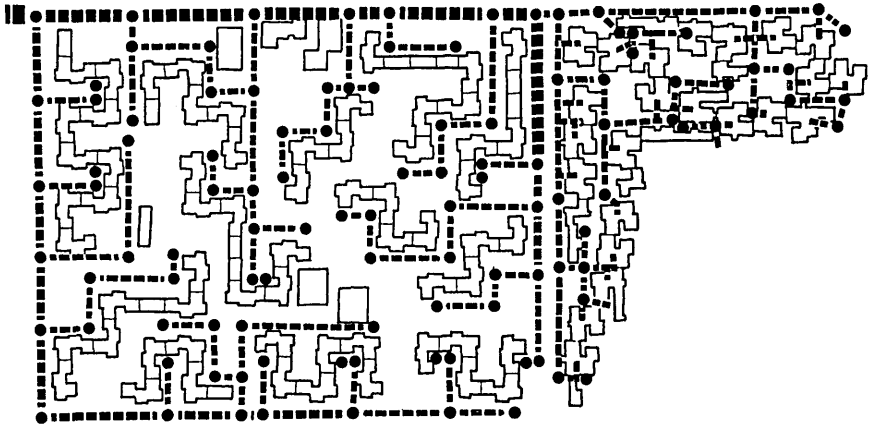
Locality Plan: *(accurate but not actual) INSTITUTO GEOGRAFICO DE COLOMBIA "AGUSTIN CODAZZI", 1971.*
Locality Land Use Pattern: *(accurate) EQUIPAMIENTO COMUNITARIO CIUDAD KENNEDY, 1976.*
Locality Circulation Pattern: *(approximate) FIELD SURVEY, JOSE ENRIQUE ROBLEDO, 1975.*
Locality Superblocks Plans: *(accurate) I.C.T., 1962-1970.*
Locality Superblocks Land Utilization: *(accurate) EQUIPAMIENTO COMUNITARIO CIUDAD KENNEDY, 1976.*
Typical Dwelling: *(accurate) I.C.T., 1962-1970. FIELD SURVEY, JOSE ENRIQUE ROBLEDO, 1976.*
Utility Services Networks: *(accurate) I.C.T., 1962-1970.*
Socio Economic Data: *(approximate) FIELD SURVEYS, ELSA CHAVEZ, JOSE ENRIQUE ROBLEDO, 1975.*
Photographs: *ARTURO ROBLEDO O., 1976. JOSE ENRIQUE ROBLEDO O., 1975.*
General Information: *INFORMES I.C.T., 1965-1976.*



WATER SUPPLY

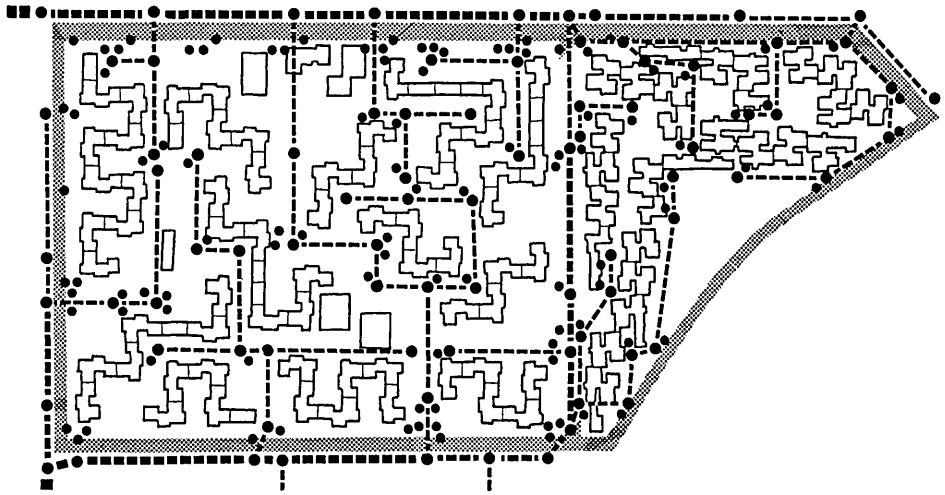
KEY	SUPERBLOCK 2	EXPERIMENTAL PLAN
● FIRE HYDRANTS	3.5 UNITS	1.5 UNITS
T STORAGE TANKS	3 UNITS	2 UNITS
△ VALVES	27.5 UNITS	10.5 UNITS
2" PIPES	----	278 METERS
3" PIPES	917 METERS	238 METERS
4" PIPES	117 METERS	382 METERS
6" PIPES	296 METERS	----
8" PIPES	464 METERS	136 METERS

SEWAGE DISPOSAL



KEY	SUPERBLOCK 2	EXPERIMENTAL PLAN
● MANHOLES	78 UNITS	32 UNITS
8" PIPES	2120 METERS	1284 METERS
10" PIPES	545 METERS	----
16" PIPES	445 METERS	----
18" PIPES	6 METERS	----

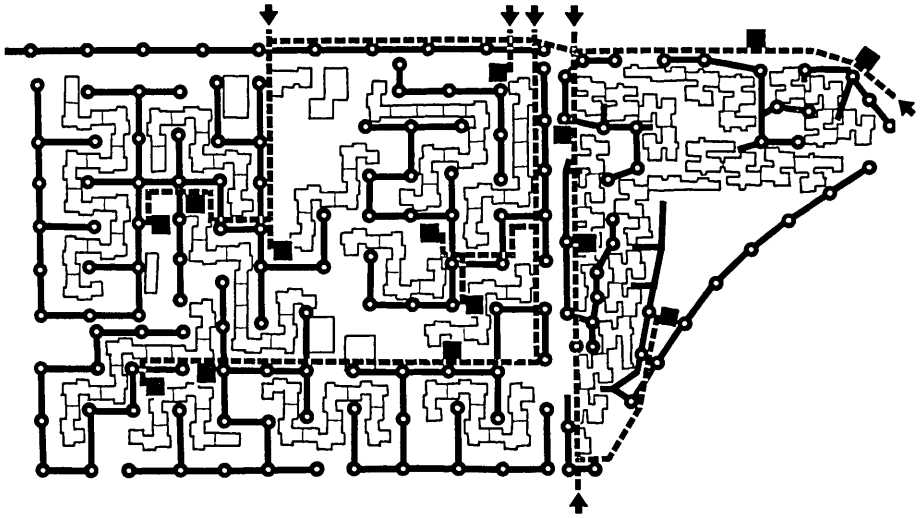
SUPERBLOCK 2 AND EXPERIMENTAL PLAN UTILITY SERVICES



CIRCULATION AND STORM DRAINAGE

KEY	SUPERBLOCK 2	EXPERIMENTAL PLAN
MANHOLES	42 UNITS	28 UNITS
INLETS	54 UNITS	25 UNITS
10"- 21" PIPES	1749 METERS	1051 METERS
24"- 33" PIPES	196 METERS	152 METERS
36"- 42" PIPES	307 METERS	----
MAIN PIPE	----	----
FINISHED PAVING		

ELECTRICITY AND STREET LIGHTING



KEY	SUPERBLOCK 2	EXPERIMENTAL PLAN
TRANSFORMERS	9 UNITS	5 UNITS
POLES WITH LAMPS	86 UNITS	72 UNITS
LOW TENSION CABLES	3073 METERS	1062 METERS
HIGH TENSION CABLES	1071 METERS	650 METERS
CITY NETWORK CONNECTIONS		

0 50 250m

1:5000

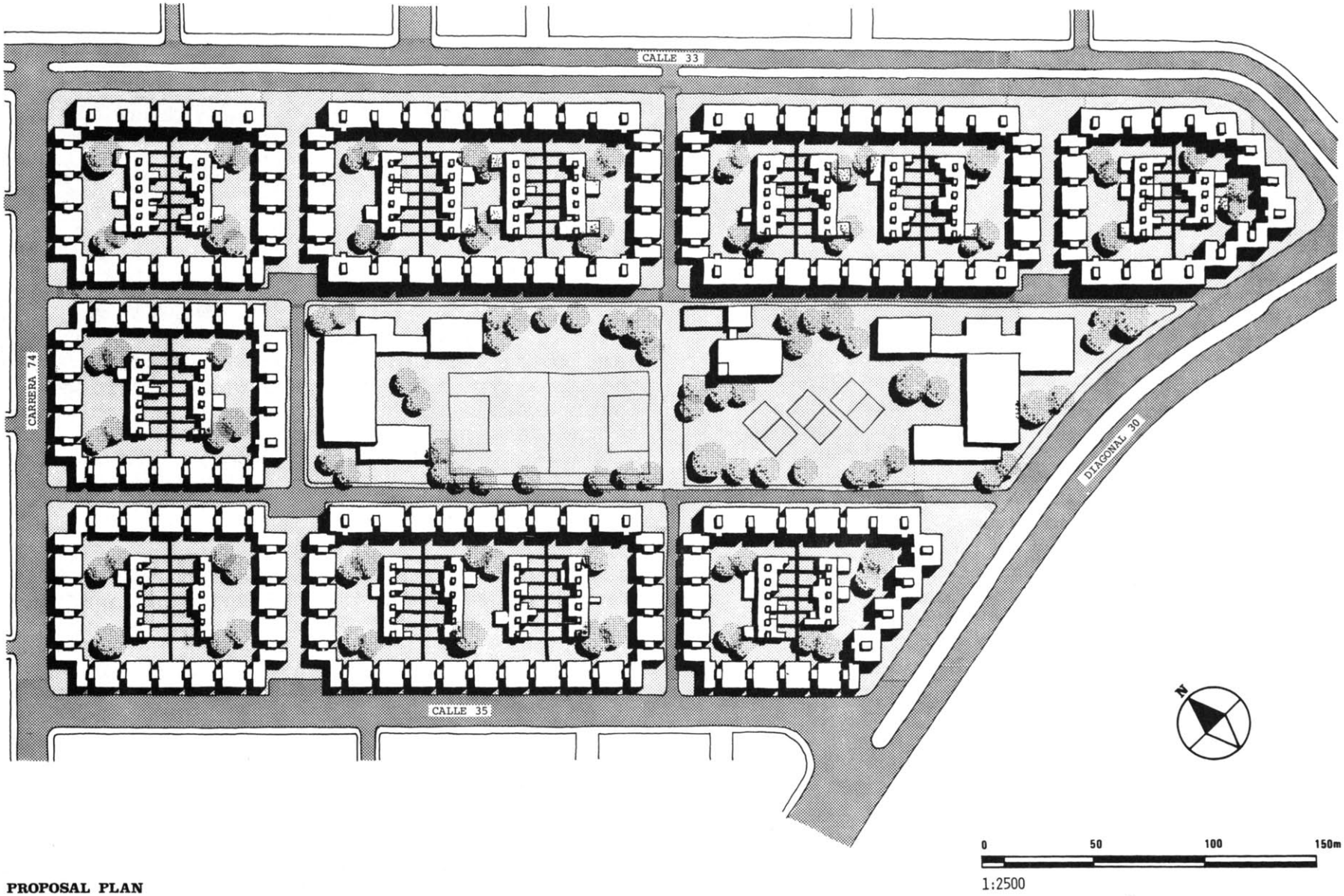
PROPOSAL

DESIGN CRITERIA

The wide criteria for designing was to have an area for private use surrounding the big communal space as a nucleus so that this can serve uniformly the private area and, besides that, to make this space property of the dwellings of this project. The dwelling units are served by the perimetrical and interior streets. The purpose of the interior streets is to disperse to the maximum using the minimum public area without losing the internal pedestrian character. With the solution of big blocks, the public area is reduced at the same time with the increase of interior spaces that are completely utilized, and in that way the number of interior streets is not any more in function of size or depth of the lots but in function of walking distances, frequency of entrances and exits, or simply streets the layout itself requires. It was tried to maintain the less vehicular access penetrating from the more important streets. The purpose of the big communal space is to contain the two schools that serve the project, the chapel, playgrounds, and any other communal use not required close to the dwelling units. The solution of a big communal space was chosen to make it more useful, and because only one space with a determined area is more adaptable than two spaces, the joint areas of which would be larger than the first one to be used for an equivalent use.

The calle 33 was considered the main commercial street and of larger extension boundering the proposal; the diagonal 30 as second in importance. Both have considerable width and for this reason higher constructions were proposed facing these streets; the same happens with the buildings facing the great communal space for reasons of absence of obstacles in front of them. However, in the interior streets low buildings were proposed due to the narrowness of these streets.

Unlike the existing project, dwellings in private lots were proposed grouping them in the interior space constituted by the walk-ups of each block. These dwellings occupy lots with similar area to those used in the rest of the locality. Also, in front of those dwellings there are lower buildings as a result of the criteria assumed initially; a vehicular access, is also possible to the semiprivate courts. The buildings along the two less important peripherical streets are of less height; the apartments with larger area as well as the commercial uses were located preferably on the main corners of the main street.



PROPOSAL PLAN

DESIGN GOALS

It was decided to make the proposal joining the Superblocks 2 and Experimental Plan, because of vicinity reasons between them and to work with a larger area in order to include the minimum communal utilities in a comfortable way, and also to maintain a point of reference with all the other superblocks of Ciudad Kennedy, which areas are equivalent to that of the proposal. This assumed criteria contains the definition of superblock with more important streets surrounding it, to communicate the superblock with the rest of the locality; with interior streets dominated by pedestrians and with enough area so that the superblock can have its own identity.

Yet, to make the comparison more effective it was decided to work with the same number of existing dwelling units in both projects, as well as working with the same area utilized by the existing commerce. Besides that it was also decided to work with the same total existing built-up area and using the same type of apartments with regard to their areas and, thus, including approximately the same number of people in the comparison. The existing communal facilities were included plus those that were considered necessary.

For the distribution of areas, table of established values for population and land uses were used as point of departure and, following the negotiation system between areas, the final result presented here was achieved without going out considerably from the point of departure.

Regarding the design of services networks and because of the same reason of reference for comparison, the criteria utilized to design the existing networks was sought and applied in the same way to the proposal, working with the same elements as far as it was possible.

PROPOSAL PLAN: LAND SUBDIVISION

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	311	14.23	21.86
DWELLING UNITS	1347	14.23	94.66
PEOPLE	8700	14.23	611.38

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	4.08	28.68
SEMI-PUBLIC (open spaces, schools, community centers)	2.67	18.79
PRIVATE (dwellings, shops, factories, lots)	3.93	27.64
SEMI-PRIVATE (cluster courts)	3.55	24.89
TOTAL	14.23	100

LAND USE

From the last chart is illustrated the minimization of public areas for circulations in benefit of semi-public and private areas.

To begin with, it is necessary to explain the type of areas, and the use and responsibility assigned each one of them individually.

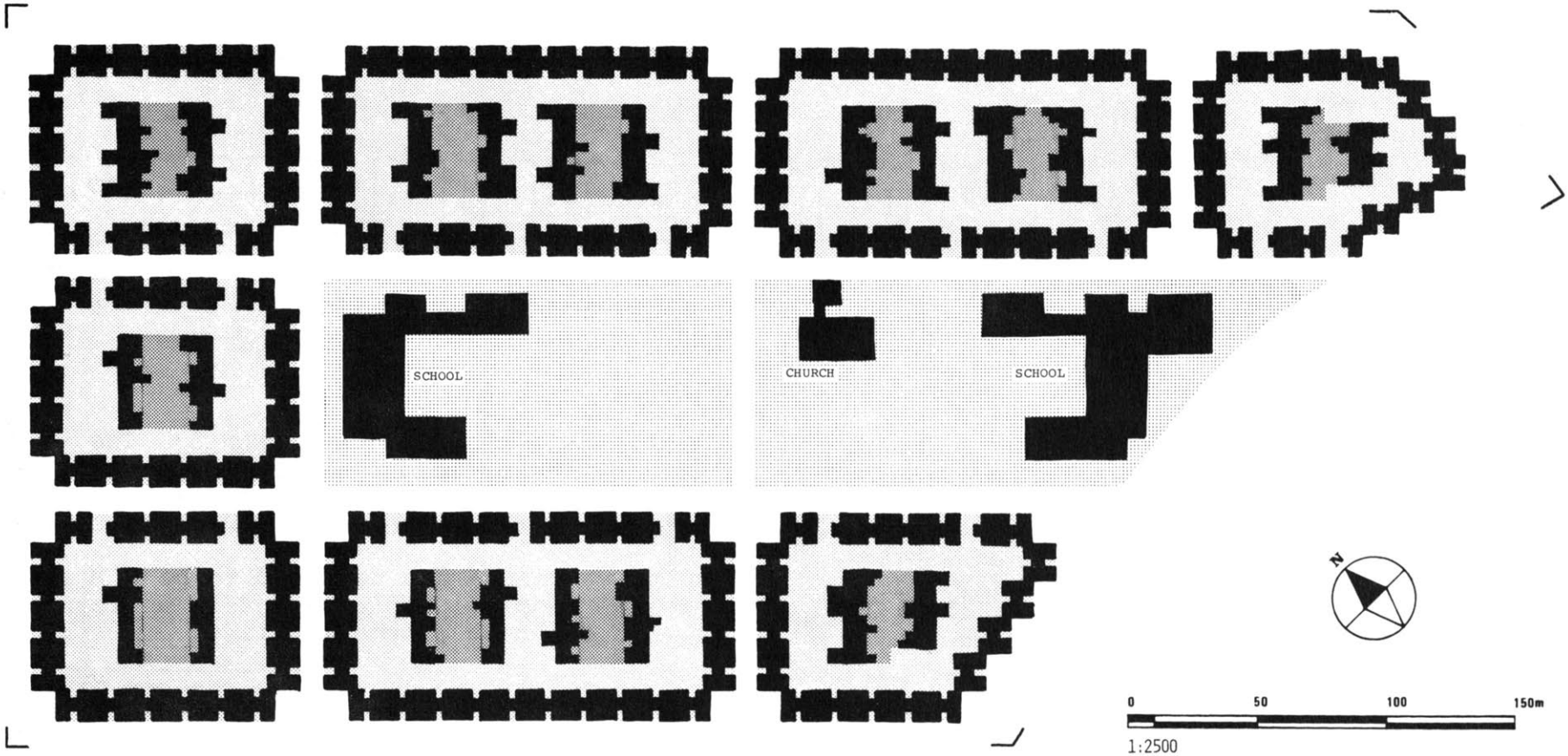
PUBLIC AREA: Urban area for circulation of vehicles and pedestrians; including streets, pedestrian ways and open spaces; under responsibility of the public sector with no control.

SEMI-PUBLIC AREAS: Urban area for utilization of the community; including open spaces, playgrounds, schools, etc.; under responsibility of users and public sector with partial or complete control, legal or physical.

SEMI-PRIVATE AREA: Urban area of shared utilization maintenance of condominium by a group; under responsibility of users and partial or complete control, social, legal or physical.

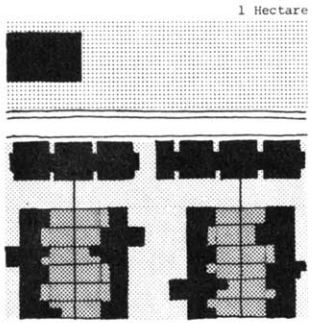
PRIVATE AREA: Urban area for utilization as residential, commercial or light industry; includes lots and dwellings; under direct responsibility of individual users and with complete control, legal or physical.

By similar definitions and to simplify calculations of areas, the semi-private area is considered as private area. It is also deducted from these definitions that the function of the public area is to serve the private area, and the public area has costs of construction or capital costs and costs of operation (administration and maintenance). This means that public ways require paving, maintenance, cleaning, light and signals, public control, safety administration, etc. All these functions represent costs that have to be paid by the users of the served private land. Therefore, the larger the relationship between public and private area the higher will be the price paid by the users.

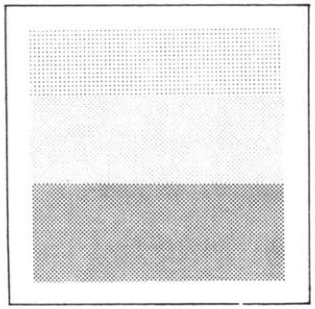


LAND UTILIZATION DIAGRAMS

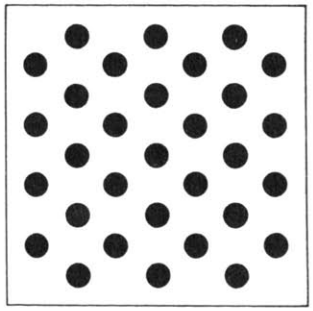
Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	



PATTERN



PERCENTAGES Streets/Walkways 28.68%
Playgrounds 18.79%
Cluster Courts 24.89%
Dwellings/Lots 27.64%



DENSITY Persons/Hectare 611

20 persons

PROPOSAL LAND USE

DWELLING UNITS

The nine different existing areas of apartments were grouped in three basic areas and from those areas the three target areas of apartments for the new project were taken. Each one of the three target areas represents the basic group with the original number of apartments belonging to them; the number of dwellings in private lots was substracted from the total number of apartments and this total was distributed equally among the three selected groups. The result was finally:

	Number	Area
Apartment A	68	91 Mts.
Apartment B	110	79 Mts.
Apartment C	1040	66 Mts.
Dwellings in Private Lots	129	–
Total	1347	

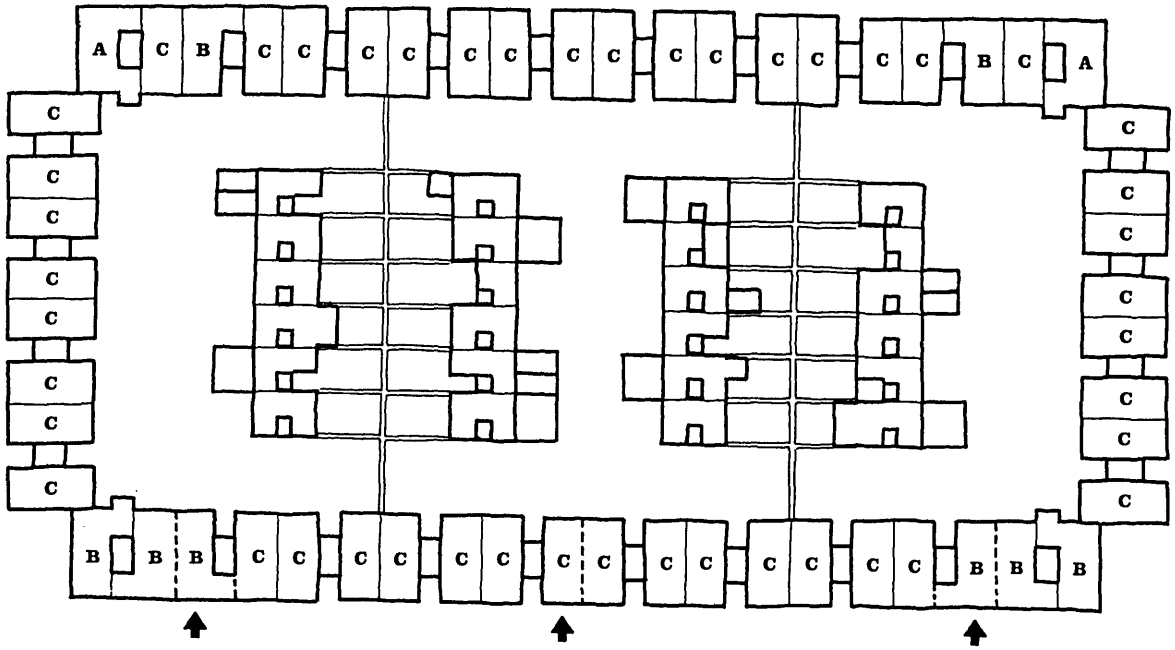
These areas do not include circulation for each apartment. It is important to comment that the difference between the areas of apartments is the area of a possible bedroom.

CRITERIA FOR DESIGNING APARTMENTS: The front of the buildings was intended to be the minimum in order to have a larger number of them sharing the use of the streets

The private lots are designed to be 6 Mts. wide and 18 Mts. deep to maintain uniformity with the rest of the locality.

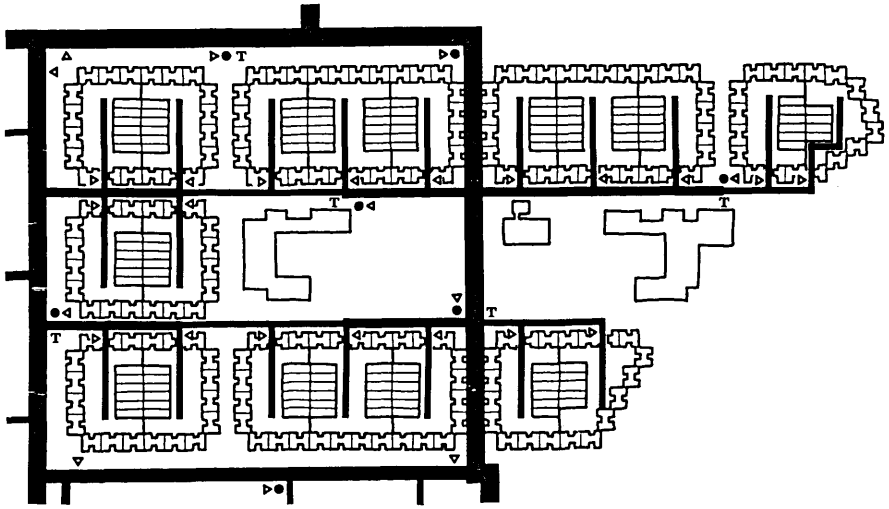
All the apartments as well as the commerce located on the ground floor occupy the area designated for the smallest apartment so that a connecting system can exist from the street to the semiprivate space through the stairway.

It was decided to go deeper into the interior of the apartment areas rather than doing so with the dwellings in private lots, because the latter does not affect the general layout and the dimension of the lots permit more freedom of choices. However, it has been taken into consideration that those dwellings can be first given as a basic shell, and the users will transform and extend them according to their financial situation.



PROPOSAL BLOCK PLAN: DWELLING UNITS

Type	Unit Area + Circulation. Square Meters	Block Number Units	Proposal Number Units	Block Building Areas. Square Meters	Proposal Building Areas. Square Meters
APARTMENT A	98	6	68	588	6664
APARTMENT B	86	28	110	2408	9460
APARTMENT C	73	164	1040	11972	75920
DWELLING	60 (Basic Shell)	24	129	1440	7740
SHOP	73	7	42	511	3066
		Total 229	1389	16.919	102.850

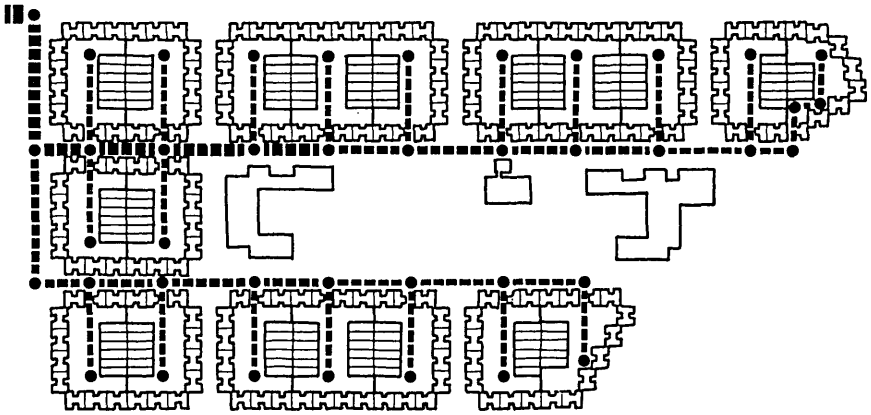


WATER SUPPLY

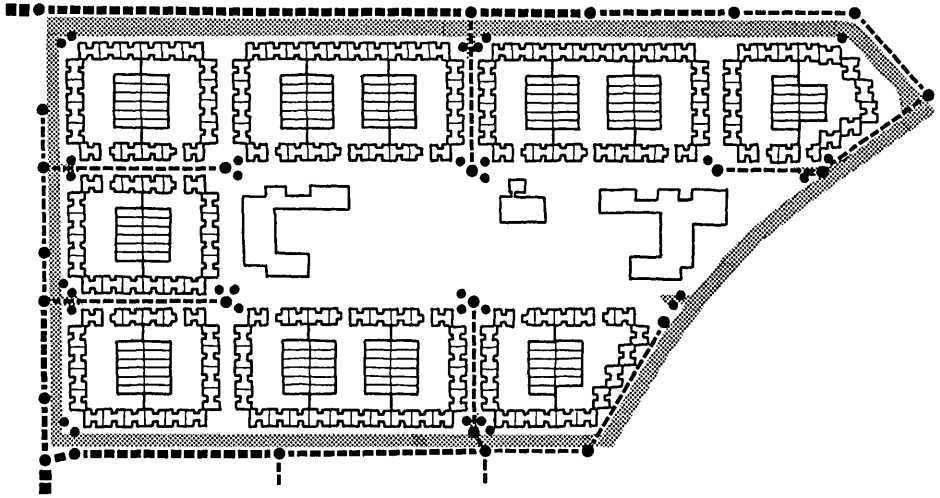
KEY	PROPOSAL	S.BLOCK 2 & EXP. PLAN
● FIRE HYDRANTS	5 UNITS	5 UNITS
T STORAGE TANKS	5 UNITS	5 UNITS
△ VALVES	27 UNITS	38 UNITS
2" PIPES	----	278 METERS
3" PIPES	1581 METERS	1155 METERS
4" PIPES	497 METERS	499 METERS
6" PIPES	152 METERS	296 METERS
8" PIPES	476 METERS	600 METERS

SEWAGE DISPOSAL

KEY	PROPOSAL	S.BLOCK 2 & EXP. PLAN
● MANHOLES	41 UNITS	110 UNITS
8" PIPES	1473 METERS	3404 METERS
10" PIPES	504 METERS	545 METERS
16" PIPES	290 METERS	445 METERS
18" PIPES	6 METERS	6 METERS



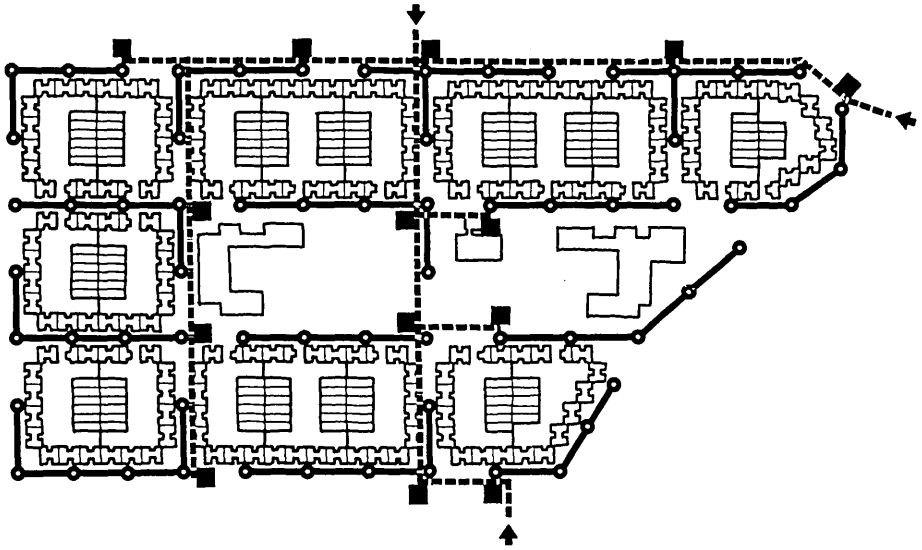
PROPOSAL UTILITY SERVICES



CIRCULATION AND STORM DRAINAGE

KEY	PROPOSAL	S. BLOCK 2 & EXP. PLAN
MANHOLES	16 UNITS	70 UNITS
INLETS	32 UNITS	79 UNITS
10"- 21" PIPES	890 METERS	2800 METERS
24"- 33" PIPES	179 METERS	348 METERS
36"- 42" PIPES	267 METERS	307 METERS
MAIN PIPE	----	----
FINISHED PAVING		

ELECTRICITY AND STREET LIGHTING



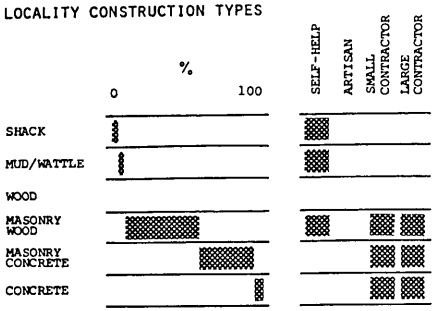
KEY	PROPOSAL	S. BLOCK 2 & EXP. PLAN
TRANSFORMERS	14 UNITS	14 UNITS
POLES WITH LAMPS	65 UNITS	158 UNITS
LOW TENSION CABLES	2128 METERS	4135 METERS
HIGH TENSION CABLES	1091 METERS	1721 METERS
CITY NETWORK CONNECTIONS		

0 50 250m

1:5000

EVALUATIONS

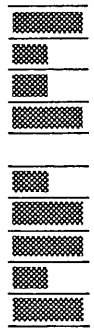
LOCALITY CONSTRUCTION TYPES



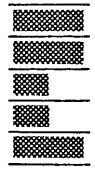
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

LAND UTILIZATION: PATTERNS, PERCENTAGES, DENSITIES

The purpose is to illustrate the relationship of patterns, percentages, densities within each case study, and by using the same format to make the comparison among all the cases in an easy manner to visualize.

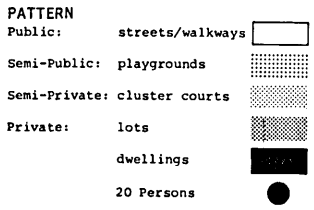
This comparison is done by taking one square in each special case; this represents one hectare that is considered very representative of the respective case. The meaning of each one of the diagrams is as follows:

PATTERN DIAGRAMS: These represent the type of layout, the dwellings, lots configuration, the subdivision of land, and the uses.

PERCENTAGE DIAGRAMS: These represent the relationships between areas. Although these diagrams cannot reflect exactly the situation of the pattern diagram, they show the existing situation of the whole case.

DENSITY DIAGRAMS: Like the percentage diagrams these reflect the situation of the whole case. The number of people is equally distributed by groups of the same number of persons all over the diagram to show the degree of human ocupation.

LAND UTILIZATION DIAGRAMS



SUPERBLOCK 6A

Public row houses:

Moderate percentage of land for streets and walkways; although the percentage of semipublic land is moderate, it is not conveniently utilized nor well maintained. A large area of private land accomodates a low population density.
Similar cases: none.

SUPERBLOCK 2

Public walk-up apartments

A very high percentage of land for public use is constituted by streets, and large open spaces with no control. The percentage of semipublic land is minimum. All the private land is occupied by the buildings. A high number of population does not have enough communal spaces.
Similar cases: 3,4.

EXPERIMENTAL PLAN

Public walk-up apartments

High percentage of land for streets and interior walkways. Moderate percentage for semipublic area does not reflect a defined use. The semiprivate land constitutes a minimum and is not properly used. The population density is not too high due to the few number of apartments in the upper floors.
Similar cases: 2,4.

S.BLOCK 2 & EXP. PLAN

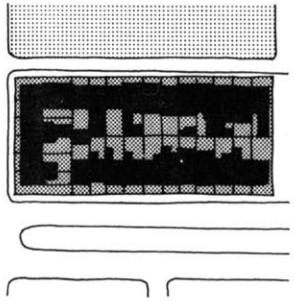
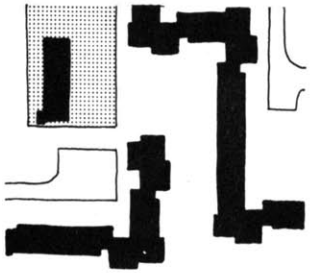
Public walk-up apartments

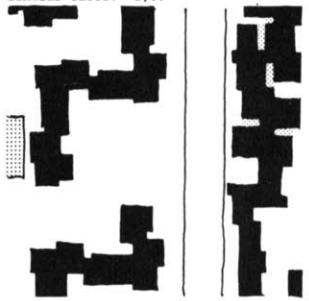
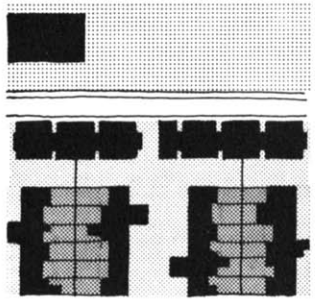
The combination of these two projects joins the disadvantages of both of them without taking any of the advantages. Percentage of public land slightly decreases compared with case 2. Semipublic percentage continues low. Semiprivate areas are even smaller, and private percentage is very low. In addition, the population density is now lower.
Similar cases: 2,3.

PROPOSAL

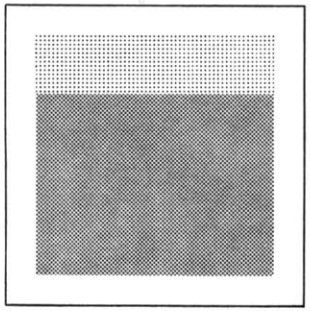
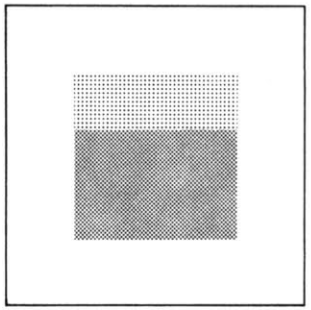
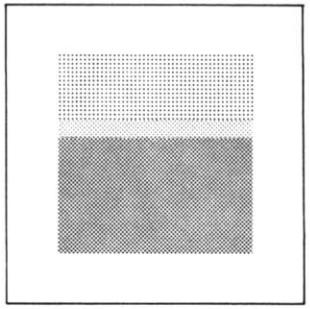
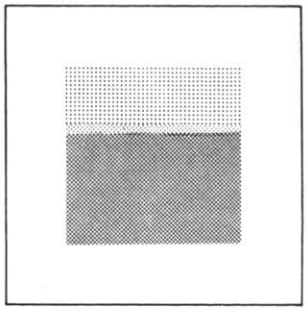
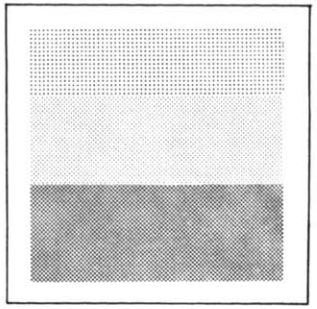
Walk-up apartments and row houses

Low percentage of land for streets and walk-ways. Comfortable areas for communal spaces. Controlled and useful semipublic spaces. Land with private utilization is sheltered and also used for private yards. In addition a high population density.
Similar cases: none.

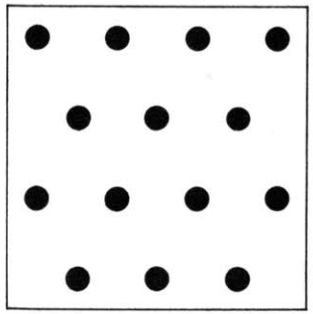
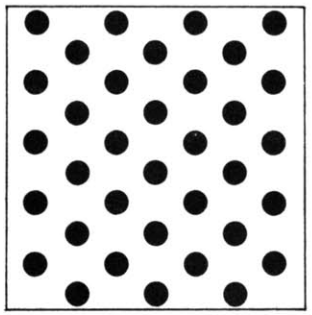
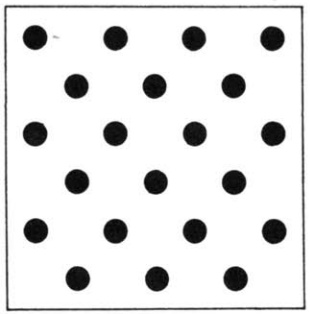
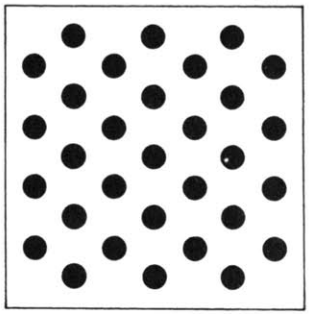
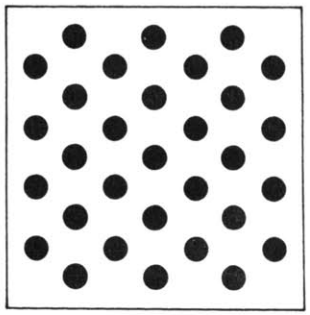



PATTERNS

PERCENTAGES

Streets/Walkways	37.87%	69.54%	56.45%	65.62%	28.68%
Playgrounds	14.25%	9.94%	15.26%	11.53%	18.79%
Cluster Courts	-	-	2.57%	0.77%	24.89%
Dwellings/Lots	47.88%	20.52%	25.72%	22.08%	27.64%

DENSITY Persons/Hectare 289 | 692 P/Ha | 422 P/Ha | 611 P/Ha | 611 P/Ha

GLOSSARY

The criteria for the preparation of the definitions have been as follows:
-FIRST PREFERENCE: definitions from "Webster's Third New International Dictionary", Merriam-Webster, 1971.
-SECOND PREFERENCE: definitions from technical dictionaries, text books, or reference manuals.
-THIRD PREFERENCE: definitions from the Urban Settlement Design Program (U.S.D.P.) Files. They are used when existing sources were not quite appropriate/satisfactory.

Words included for specificity and to focus on a particular context are indicated in parenthesis.

Sources of definitions are indicated in parenthesis.

ACCESSES. The pedestrian/vehicular linkages from/to the site to/from existing or planned approaches (urban streets, limited access highways, public transportation systems, and other systems such as: waterways, airlines, etc.) (U.S.D.P.)

ACTUAL LAND COST. "(The cost of land is)...set solely by the level of demand. The price of land is not a function of any cost conditions; it is set by the users themselves in competition."(Turner, 1971)

AD VALOREM (TAX). A tax based on a property's value; the value taxed by local governments is not always or even usually the market value, but only a valuation for tax purposes. (U.S.D.P.)

AIRPORT DISTURBANCE. The act or process of destroying the rest, tranquility, or settled state of (the site by the annoyance of airport noise, vibration, hazards, etc.) (Merriam-Webster, 1971)

AIRPORT ZONING RESTRICTIONS. The regulation of the height or type of structures in the path of moving aircraft. (Abrams, 1971)

ALTERNATINC CURRENT (A.C.) (an electric) current that reverses its direction of flow at regular intervals. (ROTC ST 45-7, 1953)

AMENITY. Something that conduces to physical or material comfort or convenience, or which contributes satisfaction rather than money income to its owner. (Merriam-Webster, 1971)

AMPERES. Amperes (amp) are a measure of the rate of flow of electricity. It is somewhat comparable to the rate of flow of water (quantity/time). A steady current produced by one volt applied across a resistance of one ohm. (ROTC ST 45-7, 1953)

APPRAISAL. An estimate and opinion of value, especially by one fitted to judge. (Merriam-Webster, 1971)

APPROACHES. The main routes external to the site (pedestrian/vehicular) by which the site can be reached from other parts of the urban context. (U.S.D.P.)

ASSESSED VALUE. A valuation placed upon property by a public officer or board as a basis for taxation. (Keyes, 1971)

ASSESSMENT. The valuation of property for the purpose of levying a tax or the amount of the tax levied. (Keyes, 1971)

BACKFILL. Earth or other material used to replace material removed during construction, such as in culvert, sewer, and pipeline trenches and behind bridge abutments and retaining walls or between an old structure and a new lining. (DePina, 1972)

BARRIER. (A boundary) as a topographic feature or a physical or psychological quality that tends to separate or restrict the free movement (to and from the site). (Merriam-Webster, 1971)

BETTERMENT (TAX). A tax on the increment in value accruing to an owner because of development and improvement work carried out by local authorities. (U.S.D.P.)

BINDER COURSE. A transitional layer of bituminous paving between the crushed stone base and the surface course (to increase bond between base and surface course). (DePina, 1972)

BITUMINOUS. A coating of or containing bitumin; as asphalt or tar. (DePina, 1972)

BLOCK. A block is a portion of land bounded and served by lines of public streets. (U.S.D.P.)

BOUNDARY. Something (a line or area) that fixes or indicates a limit or extent (of the site). (Merriam-Webster, 1971)

BUILDING CODE. "A body of legislative regulations or by-laws that provide minimum standards to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures within the city, and certain equipment specifically regulated therein." (BOCA, 1967)

BUILDING DRAIN. Lowest horizontal piping of the building drainage system receiving discharge from soil, waste, and other drainage pipes. It is connected to the building sewer. (ROTC ST 45-7, 1953)

BUILDING MAIN. Water-supply pipe and fittings from the water main or other source of supply to the first branch of the water-distribution system of a building. (ROTC ST 45-7, 1953)

CESS POOL. An underground catch basin that is used where there is no sewer and into which household sewage or other liquid waste is drained to permit leaching of the liquid into the surrounding soil. (Merriam-Webster, 1971)

CIRCULATION. System(s) of movement/passage of people, goods from place to place; streets, walkways, parking areas. (U.S.D.P.)

CLAY. A lusterless colloidal substance, plastic when moist (crystalline grains less than 0.002mm in diameter). (U.S.D.P.)

CLEANOUT. A plug or similar fitting to permit access to traps or sewer lines. Cleanouts are usually used at turns and other points of collection. (ROTC ST 45-7, 1953)

CLIMATE. The average condition of the weather at a particular place over a period of years as exhibited by temperature, wind, precipitation, sun energy, humidity, etc. (Merriam-Webster, 1971)

COLLECTION SYSTEM. The system of pipes in a sewage network, comprised of house service, collection lines, manholes, laterals, mains. (U.S.D.P.)

COMBINED SEWER. A sewer that carries both storm water and sanitary or industrial wastes. (DePina, 1972)

COMMUNITY. The people living in a particular place or region and usually linked by common interests: the region itself; any population cluster. (U.S.D.P.)

COMMUNITY FACILITIES/SERVICES. Facilities/services used in common by a number of people. It may include: schools, health, recreation, police, fire, public transportation, community center, etc. (U.S.D.P.)

COMMUNITY RECREATION FACILITIES. Facilities for activities voluntarily undertaken for pleasure, fun, relaxation, exercise, self-expression, or release from boredom, worry, or tension. (U.S.D.P.)

COMPONENT. A constituent part of the utility network. (U.S.D.P.)

CONDOMINIUM. Condominium is a system of direct ownership of a single unit in a multi-unit whole. The individual owns the unit in much the same manner as if it were a single family dwelling: he holds direct legal title to the unit and a proportionate interest in the common land and areas. Two types of condominiums are recognized: *HORIZONTAL:* detached, semi-detached, row/grouped dwelling types; *VERTICAL:* walk-up, high-use dwelling types. (U.S.D.P.)

CONDUCTORS. Materials which allow current to flow such as aluminum, copper, iron. (ROTC ST 45-7, 1953)

CONDUIT. A pipe or other opening, buried or above ground, for conveying hydraulic traffic, pipelines, cables, or other utilities. (DePina, 1972)

CONSERVATION EASEMENT. An easement acquired by the public and designed to open privately owned lands for recreational purposes or to restrict the use of private land in order to preserve open space and protect certain natural resources. (U.S.D.P.)

CONSTRUCTION BORING. A subsurface boring done at the planned location of all infrastructure and building footings and roadway sub-bases for design of foundation systems. (U.S.D.P.)

CONVEYANCE. The transfer of ownership (of land). (Merriam-Webster, 1971)

CORPORATION COCK/CORPORATION STOP. A water or gas cock by means of which utility-company employees connect or disconnect service lines to a consumer. (Merriam-Webster, 1971)

COSTS OF URBANIZATION. Include the following: *CAPITAL:* cost of land and infrastructure; *OPERATING:* cost of administration, maintenance, etc.; *DIRECT:* include capital and operating costs; *INDIRECT:* include environmental and personal effects. (U.S.D.P.)

CURRENT (See: ALTERNATING CURRENT, DIRECT CURRENT). An electric current is a movement of positive or negative electric particles (as electrons) accompanied by such observable effects as the production of heat, of a magnetic field, or of chemical transformation. (Merriam-Webster, 1971)

CYCLE. One complete performance of a vibration, electric oscillation, current alternation, or other periodic process. (Merriam-Webster, 1971)

DAM. A barrier preventing the flow of water; a barrier built across a water course to confine and keep back flowing water. (Merriam-Webster, 1971)

DEPRECIATION ACCELERATION (TAX). A tax incentive designed to encourage new construction by allowing a faster write-off during the early life of a building. (U.S.D.P.)

DESIGN. 1) The arrangement of elements that make up a work of art, a machine or other man-made object. 2) The process of selecting the means and contriving the elements, steps, and procedures for producing what will adequately satisfy some need. (Merriam-Webster, 1971)

DETACHED DWELLING. Individual dwelling unit, sepa rated from others. (U.S.D.P.)

DEVELOPMENT. Gradual advance or growth through pr gressive changes; a developed tract of land (U.S.D

DEVELOPMENT SIZE. There are two general ranges of size: *LARGE:* may be independent communities requi their own utilities, services, and community facil ties; *SMALL:* generally are part of an adjacent ur ization and can use its supporting utilities, ser- vices, and community facilities. (U.S.D.P.)

DIRECT CURRENT (D.C.) (An electric current that) flows continuously in one direction. (ROTC ST 45-7 1953)

DISCHARGE (Q). Flow from a culvert, sewer, channe etc. (DePina, 1972)

DISTANCE. The degree or amount of separation betw two points (the site and each other element of the urban context) measured along the shortest path ad joining them (paths of travel). (Merriam-Webster, 1971)

DISTRIBUTION (STATION). The part of an electric s ply system between bulk power sources (as generati stations or transformation station tapped from tra mission lines) and the consumers' service switches (Merriam-Webster, 1971)

DISTURBED SOIL. Soils that have been disturbed by artificial process, such as excavation, transporta- tion, and compaction in fill. (U.S.D.P.)

DRAINAGE. Interception and removal of ground wate or surface water, by artificial or natural means. (De Pina, 1972)

DUST/DIRT. Fine dry pulverized particles of earth, grit, refuse, waste, litter, etc. (Merriam-Webster, 1971)

DWELLING. The general, global designation of a bu ing/shelter in which people live. A dwelling cont one or more dwelling units. (U.S.D.P.)

DWELLING BUILDER. Four groups are considered: *SE HELP BUILT:* where the dwelling unit is directly bu by the user or occupant; *ARTISAN BUILT:* where the dwelling unit is totally or partially built by a skilled craftsman hired by the user or occupant; p ments can be monetary or an exchange of services; *SMALL CONTRACTOR BUILT:* where the dwelling unit is totally built by a small organization hired by the user, occupant, or developer; 'small' contractor i defined by the scale of operations, financially an materially; the scale being limited to the constru tion of single dwelling units or single complexes; *LARGE CONTRACTOR BUILT:* where the dwelling unit is totally built by a large organization hired by a developer; 'large' contractor is defined by the sc of operations, financially and materially; the sca reflects a more comprehensive and larger size of o ations encompassing the building of large quantiti of similar units, or a singularly large complex. (U.S.D.P.)

DWELLING DENSITY. The number of dwellings, dwelli units, people or families per unit hectare. Gross density is the density of an overall area (ex. including lots, streets). Net density is the densit of selected, discrete portions of an area (ex. including only lots). (U.S.D.P.)

DWELLING DEVELOPER. Three sectors are considered the supply of dwellings: *POPULAR SECTOR:* the marg sector with limited or no access to the formal fin cial, administrative, legal, technical institution involved in the provision of dwellings. The housi process (promotion, financing, construction, opera- tion) is carried out by the Popular Sector general for 'self use' and sometimes for profit. *PUBLIC S*

TOR: the government or non-profit organizations involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Public Sector for service (non-profit or subsidized housing). *PRIVATE SECTOR:* the individuals, groups or societies, who have access to the formal financial, administrative, legal, technical institutions in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Private Sector for profit. (U.S.D.P.)

DWELLING DEVELOPMENT MODE. Two modes are considered: *PROGRESSIVE:* the construction of the dwelling and the development of the local infrastructure to modern standards by stages, often starting with provisional structures and underdeveloped land. This essentially traditional procedure is generally practiced by squatters with de facto security of tenure and an adequate building site. *INSTANT:* the formal development procedure in which all structures and services are completed before occupation. (U.S.D.P.)

DWELLING FLOORS. The following numbers are considered: *ONE:* single story; generally associated with detached, semi-detached and row/group dwelling types. *TWO:* double story; generally associated with detached, semi-detached and row/group dwelling types. *THREE OR MORE:* generally associated with walk-up and high-rise dwelling types. (U.S.D.P.)

DWELLING GROUP. The context of the dwelling in its immediate surroundings. (U.S.D.P.)

DWELLING/LAND SYSTEM. A distinct dwelling environment/housing situation characterized by its users as well as by its physical environment. (U.S.D.P.)

DWELLING LOCATION. Three sectors are considered in single or multi-center urban areas. Sectors are identified by position as well as by the density of buildings as follows: *CENTER:* the area recognized as the business center of the city, generally the most densely built-up sector; *INNER RING:* the area located between the city center and the urban periphery, generally a densely built-up sector; *PERIPHERY:* the area located between the inner ring and the rural areas, generally a scatteredly built-up sector. (U.S.D.P.)

DWELLING PHYSICAL STATE. A qualitative evaluation of the physical condition of the dwelling types: room, apartment, house; the shanty unit is not evaluated. *BAD:* generally poor state of structural stability, weather protection, and maintenance. *FAIR:* generally acceptable state of structural stability, weather protection, and maintenance with some deviation. *GOOD:* generally acceptable state of structural stability, weather protection, and maintenance without deviation. (U.S.D.P.)

DWELLING TYPE. The physical arrangement of the dwelling unit: *DETACHED:* individual dwelling unit, separated from others. *SEMI-DETACHED:* two dwelling units sharing a common wall (duplex). *ROW/GROUPED:* dwelling units grouped together linearly or in clusters. *WALK-UP:* dwelling units grouped in two to five stories with stairs for vertical circulation. *HIGH-RISE:* dwelling units grouped in five or more stories with stairs and lifts for vertical circulation. (U.S.D.P.)

DWELLING UNIT. A self-contained unit in a dwelling for an individual, a family, or a group. (U.S.D.P.)

DWELLING UNIT AREA. The dwelling unit area (m^2) is the built-up, covered area of a dwelling unit. (U.S.D.P.)

DWELLING UNIT COST. The initial amount of money paid for the dwelling unit or the present monetary equivalent for replacing the dwelling unit. (U.S.D.P.)

DWELLING UNIT TYPE. Four types of dwelling units are considered: *ROOM:* A SINGLE SPACE usually bounded by partitions and specifically used for living; for example, a living room, a dining room, a bedroom, but not a bath/toilet, kitchen, laundry, or storage room. SEVERAL ROOM UNITS are contained in a building/shelter and share the use of the parcel of land on which they are built (open spaces) as well as common facilities (circulation, toilets, kitchens). *APARTMENT:* A MULTIPLE SPACE (room/set of rooms with bath, kitchen, etc.) SEVERAL APARTMENT UNITS are contained in a building and share the use of the parcel of land on which they are built (open spaces) as well as some common facilities (circulation). *HOUSE:* A MULTIPLE SPACE (room/set of rooms with or without bath, kitchen, etc.) ONE HOUSE UNIT is contained in a building/shelter and has the private use of the parcel of land on which it is built (open spaces) as well as the facilities available. *SHANTY:* A SINGLE OR MULTIPLE SPACE (small, crudely built). ONE SHANTY UNIT is contained in a shelter and shares with other shanties the use of the parcel of land on which they are built (open spaces). (U.S.D.P.)

DWELLING UTILIZATION. The utilization indicates the type of use with respect to the number of inhabitants/families. *SINGLE:* an individual or family inhabiting a dwelling. *MULTIPLE:* a group of individuals or families inhabiting a dwelling. (U.S.D.P.)

EASEMENT. Servitude: a right in respect of an object (as land owned by one person) in virtue of which the object (land) is subject to a specified use or enjoyment by another person or for the benefit of another thing. (Merriam-Webster, 1971)

EFFICIENCY. Capacity to produce desired results with a minimum expenditure of energy, time, money or materials. (Merriam-Webster, 1971)

EFFLUENT. Outflow or discharge from a sewer or sewage treatment equipment. (DePina, 1972)

ELECTRIC FEEDER. That part of the electric distribution system between the transformer and the service drop or drops. (HUD, Mobile Court Guide, 1970)

ELECTRIC SERVICE DROP. That part of the electric distribution system from a feeder to the user's service equipment serving one or more lots. (HUD, Mobile Court Guide, 1970)

ELECTRIC TRANSFORMER. A device which changes the magnitude of alternating voltages and currents; generally from distribution voltages to user voltages; a distribution component that converts power to usable voltage. (TM 5 765 US Army, 1970; U.S.D.P.)

ELECTRICAL CIRCUIT. A closed, complete electrical path with various connected loads. Circuits may either be 'parallel' (voltage constant for all connected loads) or 'series' (voltage divided among connected loads). Parallel circuits are fixtures wired independent of each other, which are used in nearly all building wiring. (U.S.D.P.; ROTC ST 45-7, 1953)

ELECTRICAL FREQUENCY. The number of times an alternating electric current changes direction in a given period of time. Measured in cycles per second: hertz. (ROTC ST 45-7, 1953)

ELECTRIC GROUND. The electrical connection with the earth or other ground. (Merriam-Webster, 1971)

ELECTRICAL NETWORK COMPONENTS. It is composed of the following: *GENERATION:* produces electricity; *TRANSMISSION:* transports energy to user groups; *DISTRIBUTION STATION:* divides power among main user groups; *SUBSTATION:* manipulates power into useful energy levels for consumption; *DISTRIBUTION NETWORKS:* provides electric service to user. (U.S.D.P.)

ELECTRIC PHASE. May be either a single-phase circuit (for small electrical devices) or a three-phase circuit (for heavy equipment, large electrical devices). In single-phase only one current is flowing through the circuit with the voltage dropping to zero twice in each cycle. In three-phase currents flow through the circuit with the power never dropping to zero. (U.S.D.P.)

ELECTRICAL POWER. The source or means of supplying energy for use; measured in watts. (U.S.D.P.)

ELECTRICAL WIRING SYSTEMS. May either be single-phase or three-phase. *SINGLE-PHASE:* 2 hot wires with 1 neutral wire; *THREE-PHASE:* 3 hot wires with 1 neutral wire. (ROTC ST 45-7, 1953)

ELECTRICITY. Electrification: the process (network) for supplying (the site) with electric power. (Merriam-Webster, 1971)

EMBANKMENT (or FILL). A bank of earth, rock, or other material constructed above the natural ground surface. (DePina, 1972)

EROSION. The general process whereby materials of the earth's crust are worn away and removed by natural agencies including weathering, solution, corrosion, and transportation; (specific) land destruction and simultaneous removal of particles (as of soil) by running water, waves and currents, moving ice, or wind. (Merriam-Webster, 1971)

EXCRETA. Waste matter eliminated from the body. (U.S.D.P.)

EXISTING STRUCTURE. Something constructed or built (on the site). (U.S.D.P.)

EXPLORATORY BORING. Initial subsurface investigations (borings) are done on a grid superimposed on the areas of interest and on areas indicated as limited/restricted/hazard in the initial survey. (U.S.D.P.)

EXTERIOR CIRCULATION/ACCESSES (SITE PLANNING). The existing and proposed circulation system/accesses outside but affecting the site. These include limited access highways as well as meshing access to the surrounding area. Exterior circulation/accesses are generally given conditions. (U.S.D.P.)

FAUCET (also TAP). A fixture for drawing liquid from a pipe, cask, or other vessel. (Merriam-Webster, 1971)

FINANCING. The process of raising or providing funds. *SELF FINANCED:* provided by own funds; *PRIVATE/PUBLIC FINANCED:* provided by loan; *PUBLIC SUBSIDIZED:* provided by grant or aid. (U.S.D.P.)

FIRE/EXPLOSION HAZARDS. Danger: the state of being exposed to harm; liable to injury, pain, or loss from fire/explosion (at or near the site). (Merriam-Webster, 1971)

FIRE FLOW. The quantity (in time) of water available for fire-protection purposes in excess of that required for other purposes. (Merriam-Webster, 1971)

FIRE HYDRANT. A water tap to which fire hoses are connected in order to smother fires. (U.S.D.P.)

FIRE PROTECTION. Measures and practices for preventing or reducing injury and loss of life or property by fire. (Merriam-Webster, 1971)

FLEXIBLE PAVEMENT. A pavement structure which maintains intimate contact with and distributes loads to the subgrade and depends upon aggregate interlock, particle friction, and cohesion for stability. (DePina, 1972)

FLOODING. A rising and overflowing of a body of water that covers land not usually under water. (U.S.D.P.)

FLOODWAY FRINGE. The floodplain area landward of the natural floodway which would be inundated by low velocity flood waters. (U.S.D.P.)

FLOW METER. A device to measure flow of water. (U.S.D.P.)

FLUSH TANK TOILET. Toilet with storage tank of water used for flushing bowl. (U.S.D.P.)

FLUSH VALVE TOILET. Toilet with self-closing valve which supplies water directly from pipe. It requires adequate pressure for proper functioning. (U.S.D.P.)

FOOT CANDLE. A unit of illuminance on a surface that is everywhere one foot from a uniform point source of light of one candle and equal to one lumen per square foot. (Merriam-Webster, 1971)

FUMES. Gaseous emissions that are usually odorous and sometimes noxious. (Merriam-Webster, 1971)

GAS. A system for supplying natural gas, manufactured gas, or liquefied petroleum gas to the site and individual users. (U.S.D.P.)

GRADE. Profile of the center of a roadway, or the invert of a culvert or sewer. (DePina, 1972)

GRID BLOCKS. The block determined by a convenient public circulation and not by dimensions of lots. In grid blocks some lots have indirect access to public streets. (U.S.D.P.)

GRIDIRON BLOCKS. The blocks determined by the dimensions of the lots. In gridiron blocks all the lots have direct access to public streets. (U.S.D.P.)

GRID LAYOUTS. The urban layouts with grid blocks. (U.S.D.P.)

GRIDIRON LAYOUTS. The urban layouts with gridiron blocks. (U.S.D.P.)

GOVERNMENT/MUNICIPAL REGULATIONS. In urban areas, the development of the physical environment is a process usually controlled by a government/municipality through all or some of the following regulations: Master Plan, Zoning Ordinance, Subdivision Regulations, Building Code. (U.S.D.P.)

HEAD. (Static). The height of water above any plane or point of reference. Head in feet = (lb/sq. in. x 144)/(Density in lb/cu. ft.) For water at 68°F. (DePina, 1972)

HIGH-RISE. Dwelling units grouped in five or more stories with stairs and lifts for vertical circulation. (U.S.D.P.)

HOT WIRE. Wire carrying voltage between itself and a ground. (ROTC ST 45-7, 1953)

HYDRAULICS. That branch of science or engineering that deals with water or other fluid in motion. (DePina, 1972)

ILLEGAL. That which is contrary to or violating a rule or regulation or something having the force of law. (Merriam-Webster, 1971)

INCOME. The amount (measured in money) of gains from capital or labor. The amount of such gain received by a family per year may be used as an indicator of income groups. (U.S.D.P.)

INCOME GROUPS. A group of people or families within the same range of incomes. (U.S.D.P.)

INCREMENT (TAX). A special tax on the increased value of land, which is due to no labor/expenditure by the owner, but rather to natural causes such as the increase of population, general progress of society, etc. (U.S.D.P.)

INFRASTRUCTURE. The underlying foundation or basic framework for utilities and services: streets; sewage, water network; storm drainage, electrical network;

gas network; telephone network, public transportation; police and fire protection; refuse collection, health, schools, playgrounds, parks, open spaces. (U.S.D.P.)

INSULATOR. A material or body that is a poor conductor of electricity, heat, or sound. (Merriam-Webster, 1971)

INTERIOR CIRCULATION NETWORK (SITE PLANNING). The pedestrian/vehicular circulation system inside the site. It should be designed based upon the exterior circulation/accesses and land development requirements. (U.S.D.P.)

INTERVAL. A space of time (or distance) between the recurrences of similar conditions or states. (Merriam-Webster, 1971)

KILOWATT (kw). (1000 watts) A convenient manner of expressing large wattages. Kilowatt hours (kwh) measure the total quantity of energy consumed in a given time. One kwh represents the use of an average of 1 kilowatt of electrical energy for a period of 1 hour. (ROTC ST 45-7, 1953)

LAMPHOLE. A vertical pipe or shaft leading from the surface of the ground to a sewer, for admitting light for purposes of inspection. (U.S.D.P.)

LAND COST. Price: the amount of money given or set as the amount to be given as a consideration for the sale of a specific thing (the site). (Merriam-Webster, 1971)

LAND DEVELOPMENT COSTS. The costs of making raw land ready for development through the provision of utilities, services, accesses, etc. (U.S.D.P.)

LAND LEASE. The renting of land for a term of years for an agreed sum; leases of land may run as long as 99 years. (U.S.D.P.)

LAND-MARKET VALUE. Refers to: 1) the present monetary equivalent to replace the land; 2) the present tax based value of the land; or 3) the present commercial market value of the land. (U.S.D.P.)

LAND OWNERSHIP. The exclusive right of control and possession of a parcel of land. (U.S.D.P.)

LAND SUBDIVISION. The division of the land in blocks, lots and laying out streets. (U.S.D.P.)

LAND TENANCY. The temporary holding or mode of holding a parcel of land of another. (U.S.D.P.)

LAND UTILIZATION. A qualification of the land around a dwelling in relation to user, physical controls and responsiblity. *PUBLIC* (streets, walkways, open spaces): user -anyone/unlimited; physical controls -minimum; responsibility -public sector. *SEMIPUBLIC* (open spaces, playgrounds, schools): user -limited group of people; physical controls -partial or complete; responsibility -public sector and user. *PRIVATE* (dwellings, lots): user -owner or tenant or squatter; physical controls -complete; responsibility -user. *SEMI-PRIVATE* (cluster courts): user -group of owners and/or tenants; physical controls -partial or complete; responsibility -user. (U.S.D.P.)

LAND UTILIZATION: PHYSICAL CONTROLS. The physical/legal means or methods of directing, regulating, and coordinating the use and maintenance of land by the owners/users. (U.S.D.P.)

LAND UTILIZATION: RESPONSIBILITY. The quality/state of being morally/legally responsible for the use and maintenance of land by the owners/users. (U.S.D.P.)

LATERAL SEWER. A collector pipe receiving sewage from building connection only. (U.S.D.P.)

LATRINE. A receptacle (as a pit in the earth or a water closet) for use in defecation and urination, or a room (as in a barracks or hospital) or enclosure (as in a camp) containing such a receptacle. (Merriam-Webster, 1971)

LAYOUT. The plan or design or arrangement of something that is laid out. (Merriam-Webster, 1971)

LEVELS OF SERVICES. Two levels are considered: *MINIMUM*, are admissible or possible levels below the standard; *STANDARD*, are levels set up and established by authority, custom of general consent, as a model, example or rule for the measure of quantity, weight extent, value or quality. (U.S.D.P.)

LIFT PUMP. A collection system component that forces sewage to a higher elevation to avoid deep pipe networks. (U.S.D.P.)

LOCALITY. A relatively self-contained residential area/community/neighborhood/settlement within an urban area which may contain one or more dwelling/land systems. (U.S.D.P.)

LOCALITY SEGMENT. A 400m x 400m area taken from and representing the residential character and layout of a locality. (U.S.D.P.)

LOCATION. Situation: the way in which something (the site) is placed in relation to its surroundings (the urban context). (Merriam-Webster, 1971)

LOT. A measured parcel of land having fixed boundaries and access to public circulation. (U.S.D.P.)

LOT CLUSTER. A group of lots (owned individually) around a semipublic common court (owned in condominium). (U.S.D.P.)

LOT COVERAGE. The ratio of building area to the total lot area. (U.S.D.P.)

LOT PROPORTION. The ratio of lot width to lot depth. (U.S.D.P.)

LUMINAIRE. In highway lighting, a complete lighting device consisting of a light source, plus a globe, reflector, refractor, housing and such support as is integral with the housing. (DePina, 1972)

MANHOLE. An access hole sized for a man to enter, particularly in sewer and storm drainage pipe systems for cleaning, maintenance and inspection. (U.S.D.P.)

MATRIX (OF BASIC REFERENCE MODELS). A set of models of urban layouts arranged in rows and columns. (U.S.D.P.)

MASTER PLAN. A comprehensive, long range plan intended to guide the growth and development of a city, town or region, expressing official contemplations on the course its transportation, housing and community facilities should take, and making proposals for industrial settlement, commerce, population distribution and other aspects of growth and development. (Abrams, 1972).

MEDIAN BARRIER. A double-faced guard rail in the median or island dividing two adjacent roadways. (DePina, 1972)

MESHING BOUNDARIES. Characterized by continuing, homogeneous land uses or topography, expressed as: *LINES:* property lines, political or municipal divisions, main streets, etc.; *AREAS:* similar residential uses, compatible uses (as parks with residential). (U.S.D.P.)

MICROCLIMATE. The local climate of a given site or habitat varying in size from a tiny crevice to a large land area, but being usually characterized by considerable uniformity of climate. (Merriam-Webster, 1971)

MODE OF TRAVEL. Manner of moving from one place (the site) to another (other parts of the urban context). (U.S.D.P.)

MODEL (OF URBAN LAYOUT). A representation of an urban residential area illustrating circulation, land utilization, land subdivision, and utility network of a specific layout and lot. (U.S.D.P.)

MUTUAL OWNERSHIP. Private land ownership shared by two or more persons and their heir under mutual agreement. (U.S.D.P.)

NATURAL FEATURES. Prominent objects in or produced by nature. (U.S.D.P.)

NATURAL UNDISTURBED SOIL. Soils that have not been disturbed by artificial process. Although natural, they depend greatly on local conditions, environment, and past geological history of the formations. (U.S.D.P.)

NEIGHBORHOOD. A section lived in by neighbors and having distinguishing characteristics. (U.S.D.P.)

NETWORK EFFICIENCY (LAYOUT EFFICIENCY). The ratio of the length of the network to the area(s) contained within; or tangent to it. (U.S.D.P.)

NEUTRAL WIRE. Wire carrying no voltage between itself and a ground. (ROTC ST 45-7, 1953)

NOISE. Any sound (affecting the site) that is undesired (such as that produced by: traffic, airports, industry, etc.) (Merriam-Webster, 1971)

ODOR. A quality of something that affects the sense of smell. (Merriam-Webster, 1971)

OHMS (electrical). The unit of resistance to the flow electricity. The higher the number of ohms, the greater the resistance. When resistance is constant, amperage (and wattage) are in direct proportion to voltage. Resistance varies inversely with the cross-sectional area of the wire. Ohms = volts/amperes. R = E/I. The practical mks unit of electrical resistance that is equal to the resistance of a circuit in which a potential difference of one volt produces a current of one ampere or to the resistance in which one watt of power is dissipated when one ampere flows through it and that is taken as standard in the U.S. (U.S.D.P.; ROTC ST 45-7, 1953; Merriam-Webster, 1971)

OPTIMIZE/OPTIMALIZE. To bring to a peak of economic efficiency, specially by the use of precise analytical methods. (Merriam-Webster, 1971)

ORGANIC SOILS. Soils composed mostly of plant material. (U.S.D.P.)

OXIDATION POND (LAGOON). A method of sewage treatment using action of bacteria and algae to digest/decompose wastes. (U.S.D.P.)

PERCENT RENT/MORTGAGE. The fraction of income allocated for dwelling rental or dwelling mortgage payments; expressed as a percentage of total family income. (U.S.D.P.)

PIT PRIVY/LATRINE. A simple hole in the ground, usually hand dug, covered with slab and protective superstructure; for disposal of human excreta. (U.S.D.P.)

PLANNING. The establishment of goals, policies, and procedures for a social or economic unit, i.e. city. (U.S.D.P.)

PLOT/LOT. A measured parcel of land having fixed boundaries and access to public circulation. (U.S.D.P.)

POLICE PROTECTION. Police force: a body of trained men and women entrusted by a government with the maintenance of public peace and order, enforcement of laws, prevention and detection of crime. (Merriam-Webster, 1971)

POPULATION DENSITY. It is the ratio between the population of a given area and the area. It is expressed in people per hectare. It can be: *GROSS DENSITY:* includes any kind of land utilization, residential, circulation, public facilities, etc. *NET DENSITY:* includes only the residential land and does not include land for other uses. (U.S.D.P.)

POSITION. The point or area in space actually occupied by a physical object (the site). (Merriam-Webster, 1971)

PRIMER. A small introductory book on a specific subject. (U.S.D.P.)

PRIVATE LAND OWNERSHIP. The absolute tenure of land to a person and his heirs without restriction of time (U.S.D.P.)

PRIVY. A small, often detached building having a bench with one or more round or oval holes through which the user may defecate or urinate (as into a pit or tub) and ordinarily lacking any means of automatic discharge of the matter deposited. (Merriam-Webster, 1971)

PROJECT. A plan undertaken; a specific plan or design. (U.S.D.P.)

PUBLIC CIRCULATION. The circulation network which is owned, controlled, and maintained by public agencies and is accessible to all members of a community. (U.S.D.P.)

PUBLIC FACILITIES. Facilities such as schools, playgrounds, parks, other facilities accessible to all members of a community which are owned, controlled, and maintained by public agencies. (U.S.D.P.)

PUBLIC SERVICES AND COMMUNITY FACILITES. Includes: public transportation, police protection, fire protection, refuse collection, health, schools, and playgrounds, recreation and open spaces, other community facilities, business, commercial, small industries, markets. (U.S.D.P.)

PUBLIC SYSTEM (general). A system which is owned and operated by a local governmental authority or by an established public utility company which is controlled and regulated by a governmental authority. (HUD/AID, Minimum Standards, 1966)

PUBLIC UTILITIES. Includes: water supply, sanitary sewerage, storm drainage, electricity, street lighting, telephone, circulation networks. (U.S.D.P.)

PUMP. A device or machine that raises, transfers, or compresses fluids or that attenuates gases especially by suction or pressure or both. (Merriam-Webster, 1971)

REFUSE COLLECTION. The service for collection and disposal of all the solid wastes from a community. (U.S.D.P.)

RESERVOIR. Large-scale storage of water; also functions to control fluctuations in supply and pressure. (U.S.D.P.)

RESIDENTIAL AREA. An area containing the basic needs/requirements for daily life activities: housing, education, recreation, shopping, work. (U.S.D.P.)

RESISTANCE. The opposition to electrical flow. (Resistance increases as the length of wires is increased and decreases as the cross-sectional area of wires is increased). (ROTC ST 45-7, 1953)

RIGHT-OF-WAY. A legal right of passage over another person's ground (land), the area or way over which a right-of-way exists such as: a path or thorough-fare which one may lawfully use, the strip of land devoted to or over which is built a public road, the land

occupied by a railroad, the land used by a public utility. Rights-of-way may be shared (as streets; pedestrians and automobiles) or exclusive (as rapid transit routes; subways, railroads, etc.) (Merriam-Webster, 1971; U.S.D.P.)

ROADWAY (HIGHWAY). Portion of the highway included between the outside lines of gutter or side ditches, including all slopes, ditches, channels, and appurtenances necessary to proper drainage, protection, and use. (DePina, 1972)

ROW/GROUPED HOUSING. Dwelling units grouped together linearly or in clusters. (U.S.D.P.)

RUNOFF. That part of precipitation carried off from the area upon which it falls. (DePina, 1972)

RUNOFF-RAINFALL RATIO. The percentage (ratio) of stormwater runoff that is not reduced by evaporation, depression storage, surface wetting, and percolation; with increased rainfall duration, runoff-rainfall ratios rise increasing runoff flow. (U.S.D.P.)

SAND. Loose, distinguishable grains of quartz/feldspar, mica (ranging from 2mm to 0.02mm in diameter). (U.S.D.P.)

SANITARY SEWERAGE. The system of artificial usually subterranean conduits to carry off sewage composed of: *excreta:* waste matter eliminated from the human body; *domestic wastes:* used water from a home/community containing 0.1% total solids; and some *industrial wastes*, but not water from ground, surface, or storm. (U.S.D.P.)

SEMI-DETACHED DWELLING. Two dwelling units sharing a common wall (duplex). (U.S.D.P.)

SEPTIC TANK. A tank in which the organic solid matter of continuously flowing sewage is deposited and retained until it has been disintegrated by anaerobic bacteria. (Merriam-Webster, 1971)

SERIES CIRCUIT. Fixtures connected in a circuit by a single wire. When one fixture is out, the circuit is broken. Fixtures with different amperages cannot be used efficiently in the same circuit. (ROTC ST 45-7, 1953)

SETTLEMENT. Occupation by settlers to establish a residence or colony. (U.S.D.P.)

SEWAGE. The effluent in a sewer network. (U.S.D.P.)

SEWER. The conduit in a subterranean network used to carry off water and waste matter. (U.S.D.P.)

SEWER BUILDING CONNECTION. The pipe connecting the dwelling with the sewer network. (U.S.D.P.)

SEWERAGE. Sewerage system: the system of sewers in a city, town or locality. (Merriam-Webster, 1971)

SHAPE. Form/configuration of the site surface as defined by its perimeter/boundaries. (U.S.D.P.)

SHOPPING. (Facilities for) searching for, inspecting, or buying available goods or services. (U.S.D.P.)

SILT. Loose, unconsolidated sedimentary rock particles (ranging from 0.02mm to 0.002mm in diameter). (U.S.D.P.)

SITE. Land (that could be) made suitable for building purposes by dividing into lots, laying out streets and providing facilities. (Merriam-Webster, 1971)

SITE AREAS. Two types are considered: *GROSS AREA:* includes the whole site or the bounded piece of ground. *USABLE AREA:* includes only the portion of the site that can be fully utilized for buildings, streets, playgrounds, recreation facilities, gardens, or other structures. (U.S.D.P.)

SITE AND SERVICES. The subdivision of urban land and the provision of services for residential use and complementary commercial use. Site and services projects are aimed to improve the housing conditions for the low income groups of the population by providing: *a) SITE:* the access to a piece of land where people can build their own dwellings; *b) SERVICES:* the opportunity of access to employment, utilities, services and community facilities, financing and communications. (U.S.D.P.)

SIZE. Physical magnitude or extent (of the site), relative or proportionate dimensions (of the site). (Merriam-Webster, 1971)

SLOPE. Degree or extent of deviation (of the land surface) from the horizontal. (Merriam-Webster, 1971)

SMOKE. The gaseous products of burning carbonaceous materials made visible by the presence of carbon particles. (Merriam-Webster, 1971)

SOIL. Soil structure: the arrangement of soil particles in various aggregates differring in shape, size, stability, and degree of adhesion to one another. (Merriam-Webster, 1971)

SOIL INVESTIGATION. It is the process to find the soil structure and other characteristics. It may include the following stages: initial soil survey, exploratory boring, construction boring. (U.S.D.P.)

SOIL PIPE. The pipe in a dwelling which carries the pipe discharge from water closets. (U.S.D.P.)

SOIL SURVEY (INITIAL). An on-site examination of surface soil conditions and reference to a GENERAL SOIL MAP. It is used to reveal obvious limitations/restrictions/hazards for early planning consideration. (U.S.D.P.)

STACK. The vertical pipe in a dwelling of the soil-, waste-, or vent-pipe systems. (ROTC ST 45-7, 1953)

STANDARD. 1) Something that is established by authority, custom or general consent as a model or example to be followed. 2) Something that is set up and established by authority as a rule for the measure of quantity, weight, extent, value or quality. (Merriam-Webster, 1971)

STANDPIPE. A pipe riser with tap used as a source of water for domestic purposes. (HUD/AID, Minimum Standards, 1966)

STORM DRAINAGE. Storm sewer: a sewer (system) designed to carry water wastes except sewage (exclusively storm water, surface runoff, or street wash). (Merriam-Webster, 1971)

STREET LIGHTING. Illumination to improve vision at night for security and for the extension of activities. (U.S.D.P.)

SUBDIVISION REGULATIONS. Regulations governing the development of raw land for residential or other purposes. (Abrams, 1972)

SUBGRADE. The layer of natural soil or fill (compacted soil) upon which the pavement structure including curbs is constructed. (DePina, 1972)

SUBMAIN or BRANCH SEWER. A collector pipe receiving sewage from lateral sewer only. (U.S.D.P.)

SUBSISTENCE INCOME. The minimum amount of money required for the purchase of food and fuel for an average family to survive. (U.S.D.P.)

SULLAGE. Drainage or refuse especially from a house, farmyard, or street. (Merriam-Webster, 1971)

TAP (also FAUCET). A fixture for drawing a liquid from a pipe, cask, or other vessel. (Merriam-Webster, 1971)

TAX EXEMPTION. A grant by a government of immunity from taxes; (a ten-year tax exemption on new housing in New York stimulated new construction in the 1920's; to ease its housing shortage, Turkey granted a ten-year tax exemption on new buildings). (Abrams, 1966)

TAX INCENTIVE. Favorable tax treatment to induce the beneficiary to do something he would not otherwise be likely to do. (U.S.D.P.)

TAX STRUCTURE - TAXATION. The method by which a nation (state, municipality) implements decisions to transfer resources from the private sector to the public sector. (U.S.D.P.)

TELEPHONE. An electrical voice communication network interconnecting all subscribing individuals and transmitting over wires. (U.S.D.P.)

TENURE. Two situations of tenure of the dwelling units and/or the lot/land are considered: *LEGAL:* having formal status derived from law; *EXTRALEGAL:* not regulated or sanctioned by law. Four types of tenure are considered: *RENTAL:* where the users pay a fee (daily, weekly, monthly) for the use of the dwelling unit and/or the lot/land; *LEASE:* where the users pay a fee for long-term use (generally for a year) for a dwelling unit and/or the lot/land from the owner (an individual, a public agency, or a private organization); *OWNERSHIP:* where the users hold in freehold the dwelling unit and/or the lot/land which the unit occupies; *EMPLOYER-PROVIDED:* where the users are provided a dwelling unit by an employer in exchange for services, i.e. domestic live-in servant. (U.S.D.P.)

TITLE. The instrument (as a deed) that constitutes a legally just cause of exclusive possession (of land, dwellings, or both). (Merriam-Webster, 1971)

TOILET. A fixture for defecation and urination, esp. water closet. (7th Collegiate Webster, 1963)

TOPOGRAPHY. The configuration of a (land) surface including its relief and the position of its natural and man-made features. (Merriam-Webster, 1971)

TRANSPORTATION. Means of conveyance or travel from one place (the site) to another (other parts of the urban context). (Merriam-Webster, 1971)

TRAP. A fitting that provides a water seal to prevent sewer gases and odors being discharged through fixtures. (ROTC ST 45-7, 1953)

TREATMENT WORKS. Filtration plant, reservoirs, and all other construction required for the treatment of a water supply. (ROTC ST 45-7, 1953)

UNIT. A determinate quantity adopted as a standard of measurement for other quantities of the same kind. (Merriam-Webster, 1971)

URBAN TRANSPORTATION. Means of conveyance of passengers or goods from one place to another along ways, routes of circulation in a metropolitan context. (U.S.D.P.)

URBANIZATION. The quality or state of being or becoming urbanized; to cause to take on urban characteristics. (U.S.D.P.)

USE TAX. The tax on land aimed primarily at enforcing its use or improvement. (U.S.D.P.)

USER INCOME GROUPS. Based upon the subsistence (minimum wage) income per year, five income groups are distinguished: *VERY LOW (below subsistence level):* the income group with no household income available for housing, services, or transportation; *LOW (1 x subsistence level):* the income group that can afford no or very limited subsidized housing; *MODERATE (3 x subsistence level):* the income group that can afford limited housing and rent only with government assistance; *HIGH (5 x subsistence level):* the income group that can afford housing without subsidy, by cash purchase, through mortgage payments, or by rent; *VERY HIGH (10 x subsistence level):* the income group that represents the most economically mobile sector of the population. (U.S.D.P.)

USUFRUCT. The right to profit from a parcel of land or control of a parcel of land without becoming the owner or formal leasee; legal possession by decree without charge. (U.S.D.P.)

UTILITIES. Include: water supply, sanitary sewerage, storm drainage, electricity, street lighting, gas, telephone. (U.S.D.P.)

UTILITY/SERVICE. The organization and/or infrastructure for meeting the general need (as for water supply, wastewater removal, electricity, etc.) in the public interest. (U.S.D.P.)

VALVE. A water supply distribution component which interrupts the supply for maintenance purposes. (U.S.D.P.)

VENT. A pipe opening to the atmosphere, which provides ventilation for a drainage system and prevents trap siphonage or back pressure. (ROTC ST 45-7, 1953)

VIBRATION. A quivering or trembling motion (such as that produced by: heavy traffic, industry, aircraft, etc. (Merriam-Webster, 1971)

VIEWS. That which is revealed to the vision or can be seen (from the site). (Merriam-Webster, 1971)

WALK-UP. Dwelling units grouped in two to five stories with stairs for vertical circulation. (U.S.D.P.)

WASTE PIPE. A pipe (in a dwelling) which carries water from wash basins, sinks, and similar fixtures. (ROTC ST 45-7, 1953)

WATER SUPPLY. Source, means, or process of supplying water, (as for a community) usually involving reservoirs, pipelines, and often the watershed from which the water is ultimately drawn. (Merriam-Webster, 1971)

WATERSHED. The catchment area or drainage basin from which the waters of a stream or stream system are drawn. (Merriam-Webster, 1971)

WATERWORKS. The whole system of reservoirs, channels, mains, and pumping and purifying equipment by which a water supply is obtained and distributed to consumers. (Merriam-Webster, 1971)

WATT. Watts (w) measure the power of the flow of energy through a circuit. Wattage is the product of volts times amperes. Both watts and hosepower denote the rate of work being done. 746w = 1hp. (ROTC ST 45-7, 1953)

ZONING ORDINANCE. The demarcation of a city by ordinance into zones (areas/districts) and the establishment of regulations to govern the use of land and the location, bulk, height, shape, use, population density, and coverage of structures within each zone. (U.S.D.P.)

EXPLANATORY NOTES

ABBREVIATIONS:

D.A.N.E.	Departamento Administrativo Nacional de Estadística
EXP. PLAN	Experimental Plan
ICETEX	Instituto Colombiano de Credito Educativo y Estudios Tecnicos en el Exterior
I.C.T.	Instituto de Credito Territorial
KM.	Kilometers
N.A.	Not Available
S. BLOCK	Superblock

QUALITY OF SERVICES, FACILITIES AND UTILITIES

None:	when the existence of services, facilities and utilities are unavailable to a locality.
Limited:	when the existence of services, facilities and utilities are available to a locality in a limited manner due to proximity.
Adequate:	when the existence of services, facilities and utilities are available in/to a locality.

QUALITY OF INFORMATION

The quality of information given in the drawings have been qualified in the following manner:

Tentative:	when based upon rough estimations of limited sources.
Approximate:	when deducted from different and/or not completely reliable sources.
Accurate:	when taken from reliable or actual sources.

URBAN CONTEXT (Pag. 3)

The numbering of paragraphs correspond to the following aspects of the urban area:

1. Primary Information
2. History
3. Economy
4. Government
5. Demography
6. Socio - Cultural
7. Socio - Economic
8. Housing

METRIC SYSTEM EQUIVALENTS

Linear Measures

1 centimeter	= 0.3937 inches
1 meter = 100 centimeters	= 39.37 inches or 3.28 feet
1 kilometer = 1,000 meters	= 3,280.83 feet or 0,62137 miles
1 inch	= 2.54 centimeters
1 foot	= 0.3048 meters
1 mile	= 1.60935 kilometers

Square Measures

1 square meter	= 1,550 square inches or 10.7639 square feet
1 hectare = 10,000 sq meters	= 2.4711 acres
1 square foot	= 0.0929 square meters
1 acre	= 0.4087

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