

PUBLIC HOUSING ENVIRONMENTS: CARACAS, VENEZUELA

BY

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May, 1979

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Department of Architecture, May, 1979

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Submitted to the Department of Architecture
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ABSTRACT

This study presents a comparison of different typical public housing systems in the city of Caracas, Venezuela. It provides data to formulate, evaluate and implement housing policies especially in the physical planning aspects. At the end, a proposed outline for a renewal project is also presented.

Thesis Supervisor:^t

Title: Horacio Caminos
Professor of Architecture

CONTENTS

PREFACE	6
INTRODUCTION	7
NATIONAL CONTEXT	10
URBAN CONTEXT	12
CASE STUDIES	18
1. Propatria	20
2. El Silencio	26
3. Pedro Camejo	32
4. Simon Rodriguez	38
5. Moran	44
EVALUATION	52
Land Utilization Summary	54
Time Process Perspective	56
Income Groups Benefited By Public Housing Policies Matrix	58
PROPOSED PROJECT	61
Existing Situation	62
Problems	63
Government Proposal	64
Proposal	65
GLOSSARY	66
REFERENCES/EXPLANATORY NOTE	70

PREFACE

CONTENT: This research on public housing environments intends to describe and evaluate the existing public housing types and their urban environments found within the city of Caracas, Venezuela.

The analysis is based on surveys, evaluations and comparisons of four public housing environments and a squatter environment. All the physical environments are described in terms of the layout design, land subdivision, land utilization and provision of the utilities.

The dwelling systems are analyzed at three different levels: Segment of the locality, a segment block within the segment, and a typical dwelling unit. Based upon the case studies, an urban model is proposed.

APPLICATION: The comparative framework for analyzing and evaluation of public housing systems used in this work can be utilized to help those involved in present and future residential developments for low income groups in decision making concerning the issue of efficient layout design.

DATA: The study is derived from field surveys carried out by the author from 1976 to 1978 and particularly during the summer of 1978. Supplemented by maps and reports from public and private agencies, the case study analysis is based on a methodology developed in the Urban Settlement Design program under the direction of Professor Horacio Caminos.

INTRODUCTION

Venezuela, Like the majority of the developing countries in the world and especially in this continent, has experienced a rapid and massive urbanization process.

According to the Mercavi surveys in 1970, 72 percent of the total population live and work in urban areas with only 28 percent of the population living in rural areas. The migratory process from rural to urban areas is consistent with several factors, but in particular follows the most opportunities for education, employment, health, etc.

These factors are found in the urban areas and lack of opportunities is the force that pushes the inhabitants from the rural environment.

In general, the majority of the migrants coming to the urban areas are from lowest economical level. When the cities do not offer adequate resources for the migrant groups with a scarce income, the immediate solution for their living problems becomes spontaneous settlements which grow up around the major cities.

Caracas is the capital and largest city in Venezuela. It is here that the main economical, administrative and social activities are transacted. It is also here that the impact of the urban crisis is particularly pronounced. The government housing solutions offered to the low and medium income sector whose capacity of payment for housing is minimal fail to provide a viable alternative. In consequence, this sector has no remedy than that of invading private and public plots with precarious dwellings.

The goal of this study is to emphasize and evaluate the relationship between the public housing settlement and its physical layout, to define and recognize the characteristic and potentials of the existing public housing patterns primarily in terms of physical structures and its relationship with different socio-economic levels, and finally, to suggest guidelines for more effective and adequate public housing policies.

In accordance with this the following public housing systems are identified:

1. ROW HOUSES: Located in the inner ring and representing only one solution in the early 1940's. These projects were intended to serve lower income groups but never reached such levels. The majority are utilized by moderate low and medium income levels. This type of project was an instant development, including all the utilities, services and complete dwelling units. In the early 1950's construction of this type was discontinued due to the rise in cost and lack of land in Caracas.
2. WALK UP APARTMENTS: Located in the inner ring and on the periphery, this solution is perhaps the most used and best designed as it generates a good community sense. Originally, this proposal was for very low and low income levels, but due to the cost of the apartments, it could only be applied for moderate and medium levels. all of these projects, too, were instant developments.

3. HIGH RISE APARTMENTS: Located in the inner ring and on the periphery, this kind of project is the most common today, because of the high cost and lack of land.

Due to its high rise nature, this type of project is constructed as an instant development and is utilized only for moderate low and medium income levels.

This type of project has been criticized because in many cases a sense of community relationship is non-existent and there is a lack of a sense of ownership by the people. This situation is reflected in many social aspects.

4. SQUATTER: The majority of the squatter areas are located on the periphery. These areas reflect the low income level of the people whereby the majority of the land is in illegal tenure and represent a high percent of the total housing in the city.

In general, the development is incremental until consolidation of the houses occurs. There is an almost total lack of the majority of services and facilities.

5. TENEMENTS: Predominantly located in the city center and the inner ring, this type of project, due to its cost and location, was generally the first solution when the very low and low migrants came to the city.

Primarily, tenements are traditional houses adapted for the new use.

CONTENTS

This study has been divided into four sections:

1. National and Urban context: This is a general overview of the national situation and urban areas where the case studies are located.
2. Case Studies: This section contains the four cases studied of public housing and one case studied of a squatter settlement which have been analyzed in relation to the land and dwelling systems.
3. Evaluation: This section contains the evaluation of several cases studied and compared in relation to specific aspects such as:
 - Land utilization summary
 - Time process perspective
 - Public housing evaluation
4. Proposal Project: This proposal is presented with the idea of suggesting policies for consideration in the planning of renewal projects within Caracas City.

NATIONAL CONTEXT

Venezuela

PEOPLE:

Population: 12,300,000. (Estimates)
 Urban Population: 75.5% (1975 Estimates)
 Rural Population: 24.5% (1975 Estimates)
 Population Growth: 3.1 per annum
 (1975 Estimates)
 Population Density: 91 inhabitants/sq. km.
 (1975 Estimates)

Ethnic Groups: Spanish
 Italian
 Portuguese
 Arab
 German
 American Indian

Religion: Roman Catholic 96%
 Language: Spanish 98%
 Literacy: 80%
 Life Expectancy: 66 years

GEOGRAPHY:

Area: 912,050 sq. kms.
 Major Cities: Caracas City (capital)
 2,400,000
 Maracaibo 900,000
 Barquisimeto 300,000
 Ciudad Guayana 200,000

ECONOMIC:

Gross National Product (GNP):
 U.S.\$ 27.6 billion

GNP per Capita : U.S.\$ 2,240

GNP per Capita Growth Rate : 6.8%

Currency : Bolivar
 (4.28= U.S.\$ 1)

AGRICULTURE:

Land under cultivation 2%; Labor force 20%
 Products: rice, coffee, corn, sugar, bananas.

INDUSTRY:

Labor:
 Products: refined petroleum products, paper,
 metal products, textiles.

NATURAL RESOURCES:

Petroleum, natural gas, iron, gold, ore,
 other minerals, hydroelectric power

TRADE:

Exports: 11.2 billion (1975)
 petroleum, iron, coffee, cocoa.

Imports: 5.4 billion (1975)
 Machinery and transport equipment,
 manufactured goods, chemicals, food-
 stuffs.

Partners: U.S., Japan, European communities.

GOVERNMENT:

Type: federal republic
 Established: 1821
 Constitution: 1961
 Branches: Executive-President, Chief of State
 Head of Government.
 Legislative- Bicameral
 Judicial- Supreme Court, local and
 federal system.

Political Parties:
 Democratic Action (A.D.)
 Social Christian (COPEI)
 Communist (PCV)

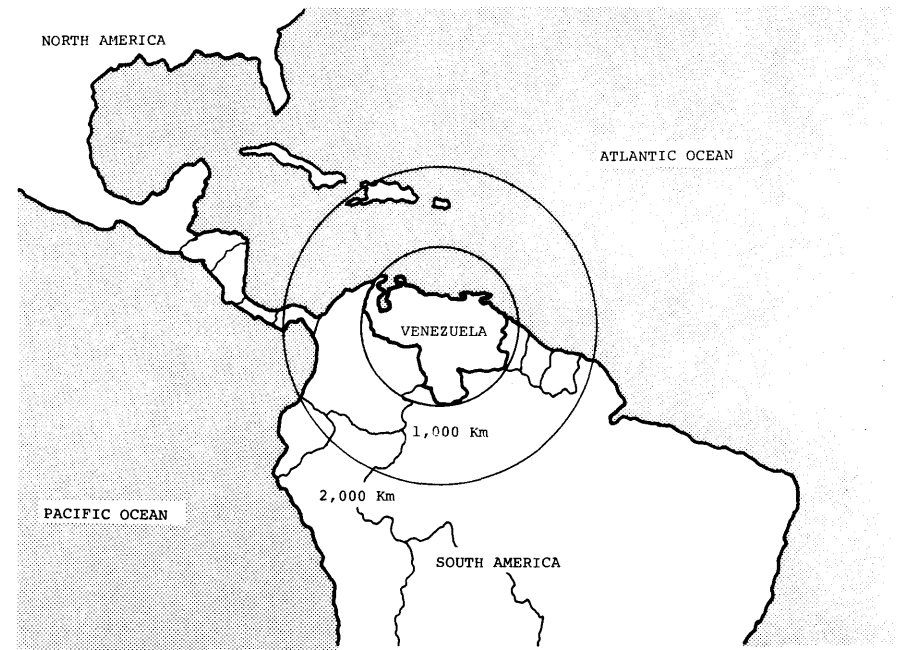
Suffrage: Universal and compulsory over 18
 Political Subdivisions: 20 states, 2 federal
 territories, 1 Federal District,
 and numerous islands.

HISTORY: Three distinct periods can be identified in the history of Venezuela: colonial period; independence period; and the republic period.

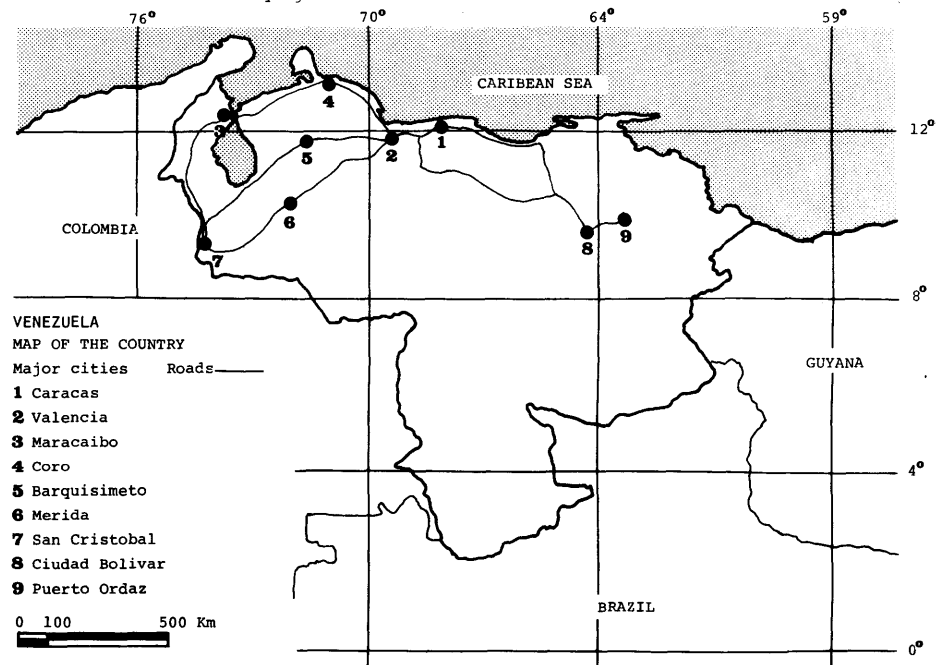
The colonial period begins when Columbus discovered Venezuela on his third voyage in 1498. A subsequent Spanish explorer gave the country its name, meaning "Little Venice." This period has been characterized by four major changes in the socio-cultural structure, introduced by the ruling Spanish: the introduction of Roman Catholicism; the founding of many new towns; the exploitation of Indian labor; and the extraction of natural resources, mainly precious metals.

"Criollos," Venezuelan born Spanish, were responsible for the independence obtained in 1810. This marks the end of the colonial period and the beginning of the independence period. It was not until 1821, however, that independence was won under the leadership of Simon Bolivar, Venezuela's national hero.

In the 19th century, the republic period



LOCATION MAP: Circles represent approximately one hour flying time



of Venezuela was characterized by frequent stages of political instability, dictatorship and in general, revolutionary turbulence. The 20th century has been identified by long periods of authoritarianism that were represented by the dictatorships of General Juan Vicente Gomez, who was head of the government for almost 27 years from 1908 to 1935. Thereafter, there was a struggle between democratic forces and those advocating a return to strong-man rule.

In 1946, a well-known writer, Romulo Gallegos, candidate of the democratic party, Accion Democratica, easily won the presidential election. But in 1948, the army ousted Gallegos and instituted a military junta. In 1952, this junta named Marco Perez Jimenez provisional president, but he soon became a dictator. In 1958 the army ousted Perez Jimenez and called the political parties for a system of representative government which has been in effect until now.

There were four consecutive democratic elections in 1959, 1963, 1968, and in 1973. From 1959 to 1963, the head of the government was Romulo Betancourt. He was the first popularly elected president in Venezuela's history to complete his term in office. President Betancourt had many problems with the rightist military and civilians and with leftist subversives supported by Fidel Castro. During Betancourt's term in office, many changes took place in the government and social areas.

Betancourt's successor, Raul Leoni, was head of the government between 1964 and 1968. He continued and consolidated many of the actions of his predecessor. President Leoni was succeeded by Doctor Rafael Caldera (1969-1973), of the opposition party.

Under Caldera, Venezuela joined the Andean Pact, and began a major program of public housing. His A. D. successor, Carlos Andres Perez (1974 to 1978) is the present president of Venezuela. During Perez's term many large programs of industrial expansion have been initiated, as well as government ownership of extractive industries, basically petroleum and iron.

PEOPLE: Venezuela is one of the least densely populated countries of the Western hemisphere. The population is concentrated in the north-east, basically in the Andes Mountains and along the coast line. Only 4% of the total population lives in the south-west portion. The annual population increase has been approximately 3.4%, one of the highest in the world. The population is rapidly changing from rural to urban areas. For example, in 1934 only 34% of the population lived in cities and towns of more than 1,000 inhabitants, but now almost 75.5% of the population lives in cities while rural areas are rapidly being abandoned.

The governmental system is of a central form with federal and public power located in Caracas City. For this reason one out of every five Venezuelans lives in the capital city.

In general, most of the people are of European, Indian, and Negro extraction and according to the 1970 census, 94% of the total population was native-born. Most of the foreign-born were from Spain, Portugal, Italy, and Colombia. The indigenous Indian population is very small with approximately 40,000.

GEOGRAPHY: Venezuela is located in northern South America and has a boundary with Colombia, Brazil, Guyana, and the Caribbean Sea. Venezuela has a coastline of 2,816 kilometers on the Atlantic Ocean and the Caribbean, and additionally, it claims the territory east of the present boundary with Guyana which would give additional coastline on the Atlantic.

Four distinct geographic regions can be defined in Venezuela, and are the following: the Andes Mountains in the northwest; the coastal zone which includes the Orinoco River Delta on the north; the plains or Llanos which extend from the mountains to the Orinoco River; and the Guyana Highlands, a vast area of high plateau on the south and east of the Orinoco River. (Found in the Guyana Highlands is the world's highest waterfall, the Angel Falls, which is more than one mile high.)

Venezuela is situated in the Torrid zone where the temperature varies with the altitude. For most of the country the rainy season is from May through November, leaving the rest of the year dry.

ECONOMY: The economics of Venezuela can be divided into two large areas: natural resources and agriculture-industry. Natural resources: Venezuela is one of the world's leading oil-producing and exporting countries. It is one of the founding members of the Organization of Petroleum Exporting Countries (OPEC).

Oil accounts for over 90% of Venezuela's foreign exchange earnings, over two-thirds of the government revenue and for more than 30% of its GNP. In January, 1976, the government nationalized the petroleum industry, which originally produced 3.7 million barrels per day (1970), but now produces 2.3 million barrels. The basic reasons for this reduction in production have been a lack of investment in exploration and development and a reduction program initiated by the government for the conservation of this basic product.

Venezuela exports about one-half of its oil production to the United States. As a major producer of iron ore, the government has instigated programs to expand domestic steel production from one million metric tons in 1976 to 10 million metric tons by 1990. Aluminum production is also scheduled to increase from 70,000 metric tons in 1976 to about 400,000 metric tons by 1980.

The second area of economics of Venezuela is agriculture and industries. Agriculture accounts for approximately 6% of the GNP and employs 20% of the total labor force. However, food production has failed to increase, resulting in increased food imports to maintain an adequate food supply. The government has given this area a high priority and has implemented policies which emphasize credit for irrigation and storage.

There has been a 12% increase per year in the manufacturing area which represents almost 24% of the GNP manufacturing accounts for 19% of the labor force.

GNP and Budget: In 1976, the GNP was 27.6 billion, with an increase of 6% over 1975. The GNP is the third highest in Latin America and in 1975, the per capita GNP was over \$2,200. The government income in 1976 was \$9.8 billion and expenditures were \$10.3 billion. Estimates for 1977 run approximately \$8.3 for income and about \$8.2 billion for expenditure. In 1975, about one-third of Venezuela's exports went to the United States.

GOVERNMENT: The system of government in Venezuela is of a federal and centralized form that guarantees freedom of religion, speech, business, etc. National elections are held every five years for President, members of Congress and the state legislatures. There are no midterm or by-elections and the President can be elected to only one term, but may be re-elected ten years after the end of that term. The ex-Presidents are members of the Senate for life.

The executive, legislative, and judicial branches are separate. The President and his Ministers (Cabinet) make up the executive branch and basically hold the most important decision-making power in the country. However the legislative branch is very important, too. The legislative responsibility is vested in the bicameral Congress. Judicial power is exercised by a Supreme Court of Justice and by the other courts.

URBAN CONTEXT

Caracas, Venezuela

1. PRIMARY INFORMATION: Caracas, the capital city of Venezuela, is located in the north-central section of the country in a narrow valley between two mountain ranges. It has a latitude of 10 degrees north and a longitude of 64 degrees west.

The climate in Caracas is mild with a temperature range of 16 degrees C to 28 degrees C, resulting from an elevation of 950 meters from sea level.

2. HISTORY: Caracas was founded by the Spanish Captain Diego de Lozada and a small group of Spanish soldiers and civilians in 1567.

During the years 1567 to 1718, the living conditions in Caracas City were very poor as Venezuela lacked the wealth of Mexico or Peru and was given little attention by the Spanish Crown. But in 1777, Caracas was elevated to the category of "Capitania General" directly under the Crown. However, it was not until 1786 that the Spanish Crown gave the "Royal Audiencia" to Caracas enabling a majority of decisions to be made in Venezuela.

In 1810, many Criollos (Venezuelan born Spanish) decided to depose the Spanish Captain General of Caracas and declare independence. The urban growth of the city until the declaration of independence was almost nothing as compared to when the city was founded. The population was hindered from growth by diseases and earthquakes and in 1812, an earthquake almost destroyed the whole city. During the presidency of Guzman Blanco in 1870, the city changed as the government invested large amounts of money in public facilities and community services. But with the economic situation unstable, urban growth was still small. In 1920, when petroleum and commercial activities increased to a considerable extent, urban growth increased as a result of a

strong migration of national and foreign peoples to Caracas. Because of this, the population almost doubled between 1930 and 1950 and has continued to grow. Today, this growth has resulted in a demographic explosion and land speculation which has created a chaotic situation.

3. ECONOMY: Caracas has emerged as an urbanized, wealthy and powerful city. When the economic system changed in 1920, the demographic structure was altered. The traditional agriculture-based economy was transformed into an urban and modern industrial system. This changeover was accompanied by an intense rural to urban migration, with the greater percentage moving to the capital city. At the same time, accelerating opportunities brought large numbers of migrants to Caracas.

Economically, Caracas is probably the most important city of Venezuela in that it is the capital city in a centralized governmental system. All economic decisions are made in Caracas and the major trade companies are located in the city. Caracas has more than 19.3% of the total labor force of the country.

4. GOVERNMENT: The city of Caracas is located in the unique Federal District of Venezuela.

This area has a Governor who is appointed by the President. He is the authority for almost the same time as the president, who is the only person that can remove him. The delegates from the different district departments are appointed by the Governor and in some cases elected by the people. Their authority is limited by law, primarily in reference to taxation, public works, health, education, etc.

In general, the Governor has authority only in relation to small areas of the city and in investment and control of district money.

5. DEMOGRAPHY: The city's population grew from less than 95,000 inhabitants in 1941 to 2.4 million inhabitants in 1971. In 1976, the population was estimated at over 3

million and is projected to reach over 4.5 million by 1990.

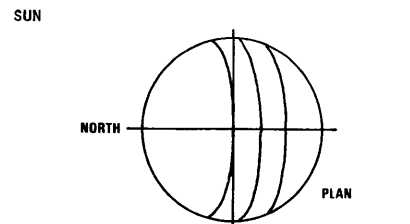
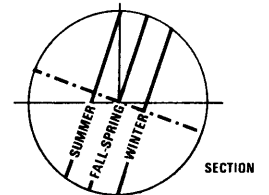
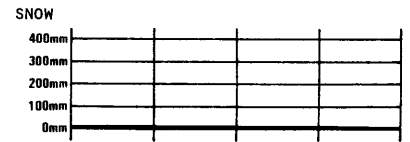
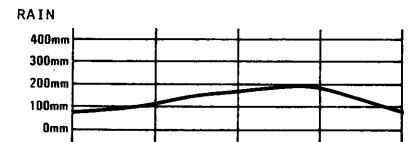
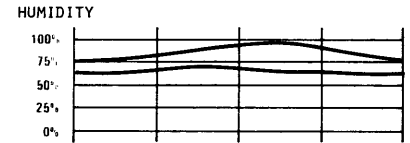
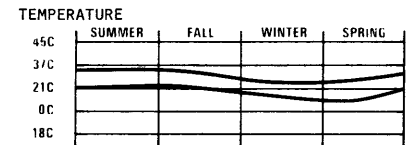
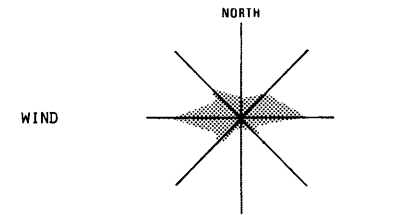
The rate of growth for the 1955- 1970 period was a high 3.1%. The 1971 census revealed an age structure typical for a developing country with a high birthrate and low death rate. Nearly 35.9% of the population was under the age of fifteen according to the census. At this moment, 25% of the total population of the country live in Caracas and an extensive study of the mechanisms of migration in Venezuela has shown that Caracas is the most attractive center of the country.

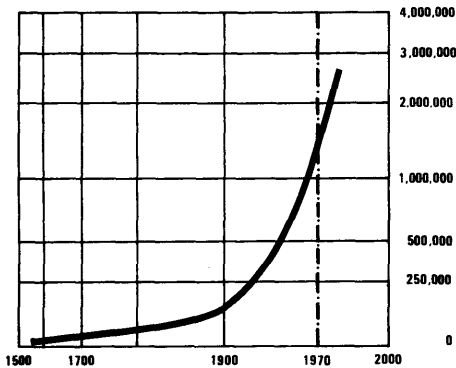
5. SOCIO-CULTURAL: Caracas in its early history was a poor city with a rigid social system and numerous rural and indian populations. The political system was organized around a "Caudillo" and virtually disenfranchised masses. The upper class controlled much of the economy, land, business, etc. But after 1920, the society underwent remarkable changes stemming from the discovery of petroleum.

The people of Caracas gained greater mobility and the traditional values almost disappeared. Society became more flexible and brought about a greater mixing of the classes. Social class level became more permeable and job opportunities were available for everyone. The middle class increased in strength with relative ease of access for members of the lower class. The upper class perhaps gained the most advantage with the new economic situation, but in relation to political power the middle and low income people obtained greater opportunities and access to major positions.

6. SOCIO-ECONOMIC: 49.75 percent of the population are low and very low income, earning less than U.S. \$225 per month (1967 estimate). 48.36 percent are moderately low, middle low, and middle who earn less than U.S. \$574 per month. 1.89 percent receive more than U.S. \$574 per month. However the very lowest income population is found in general barrio residents (squatter residents), constituting almost 25% of the population of Caracas. The average monthly

CARACAS, 10° 30' N





URBAN POPULATION GROWTH
horizontal: dates vertical: population
Source: Direccion General de Estadisticas, 1970

income of this group was approximately U.S. \$116 in 1975 with some estimates listing one-third of the squatter residents as unemployed.

7. URBAN GROWTH: The urban growth of the Caracas city can be divided in five periods The Colonial Period(1567-1897), the general city planning patterns which were later encoded in the laws of the Indias. The laws call for a city major plaza surrounded by the Cathedral and Government office buildings. The 1578 layout, shows the plaza's central position and the city's blocks radiating from it. The establishment of the city as the national capital stimulated rapid growth which is reflected in the 1772 city plan. The growth of the city was organized by the original block structure, and the centralized location of the cities institutions. The state assisted period(1897-1938) During the first part of the 20th century.

The state helped to develop cities infrastructure in public building and places. It was a period of territorial consolidation at this time the city lacked urban character.

It was a small town dominated by a status oriented society. Movement was by horses an inefficient means which made trade difficult in the congested city streets. However the central area was reaching its maximum capacity. As the population grew to 135,000 inhabitants. The central area was filled to capacity. and new developments were required at the perimeter.

The Expansion period(1938-1950). With the development of the oil industry and the new wealth brought to the country, rapid change came to the city. To the East high and middle income populations created new housing on former agricultural land.

The exodus of the wealthy from the old city created a new force in the city's development. As the city became linear and economically segregated a new characted emergep. The central area was also impacted. The original block suffered the effects of speculation. Rising land prices forced the people to subdivide their houses. To the west and south-west encampments of the rural

poor, who migrated to the city for its opportunities, grew at an accelerating rate. The Urban Explosion period(1950-1961). During this period the cities population grew from. 495,000 to 786,000 inhabitants.

The growth transformed the city services and infrastructure. To fill the desperate need for housing the state actively created new housing programs for low income housing. The government gave great incentives to the construction industry to develop new housings. Consequently land prices and speculation grew tremendously, the outcome of which was the construction of apartments for high and middle class income. The Stabilization period(1961-to present). During this period urban migration and high birth rate continued. To raise the city population to 2,000,000. inhabitants, essential services were expanded and the need to coordinated development became mandatory. The projects were located at the city perimeter to escape the higher cost of land.

8. HOUSING: The housing program of the government is designed to de-centralize people and industry to the smaller cities and rural localities. It's aim is to decrease the urban population growth in Caracas and big cities in all the country.

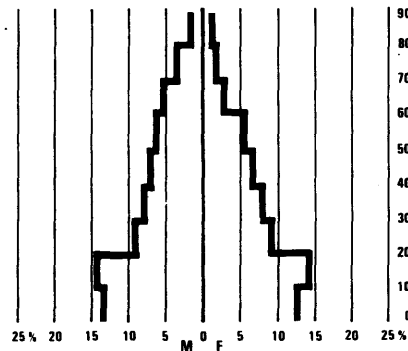
Many of the public sector housing consists of high rise apartment buildings due to the lack of land and land speculation in urban areas of Caracas.

The rate of public construction was more than double between 1972 and 1976, and another near doubling is expected between 1976 and 1980. In addition, the average 1971 occupancy rate per unit of 5.8 persons was among the highest in the Americas.

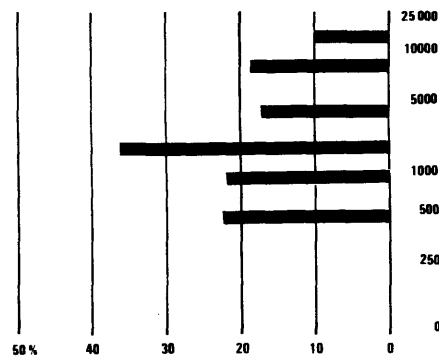
In the mid-1970's, Caracas was becoming largely a city of middle-income housing, mainly in the form of high rise apartments. Today about 40% of the city's population live in apartments and a large proportion of the urban poor live in shanties (ranchos) frequently constructed by their occupants with scrap materials. In 1971 almost one million urban residents occupied nearly 170,000 of this type of dwelling in Caracas. Their location in gullies in the slopes of

mountains surrounding the city makes them vulnerable to the danger of landslides.

In general, the squatter population is made up predominantly of migrants from other parts of the country. The 1971 census found that 34% of Caracas' population had lived in Caracas less than five years. A final consideration is that housing distribution in Caracas in 1966 was 34 percent apartments, 32 percent houses, and 20 percent shanties.



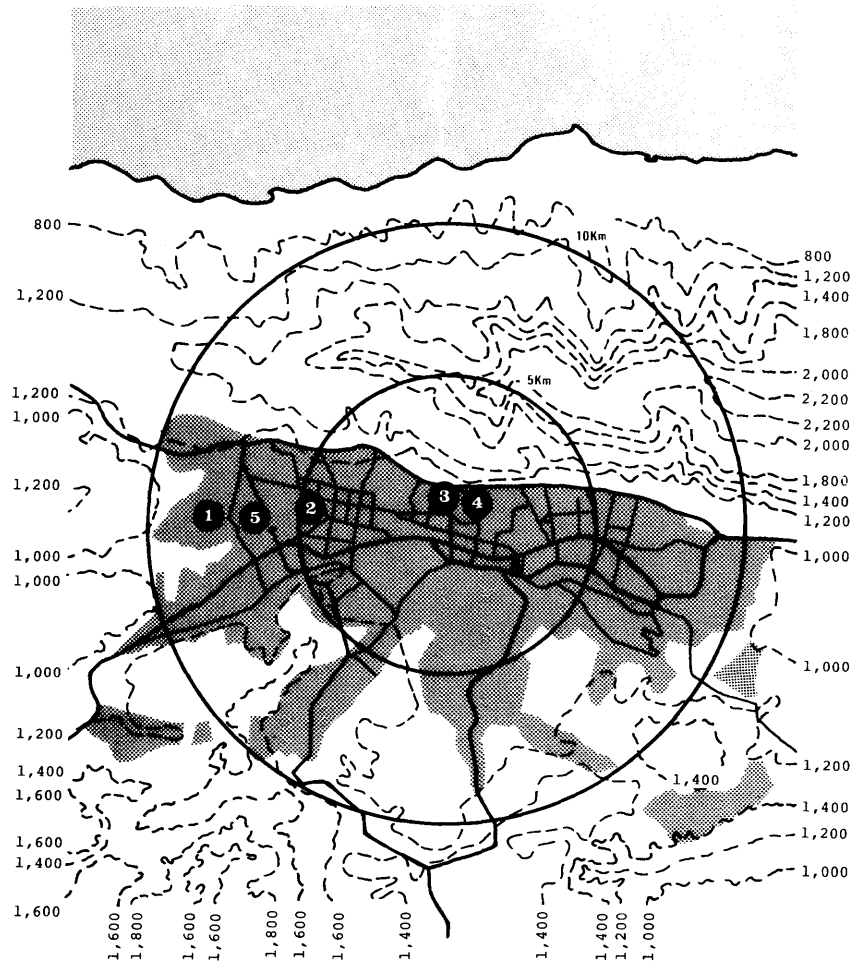
URBAN POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M females: F
Source: Census, 1970; O.M.P.U



URBAN ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Source: Census, 1970; Mercavi 70.

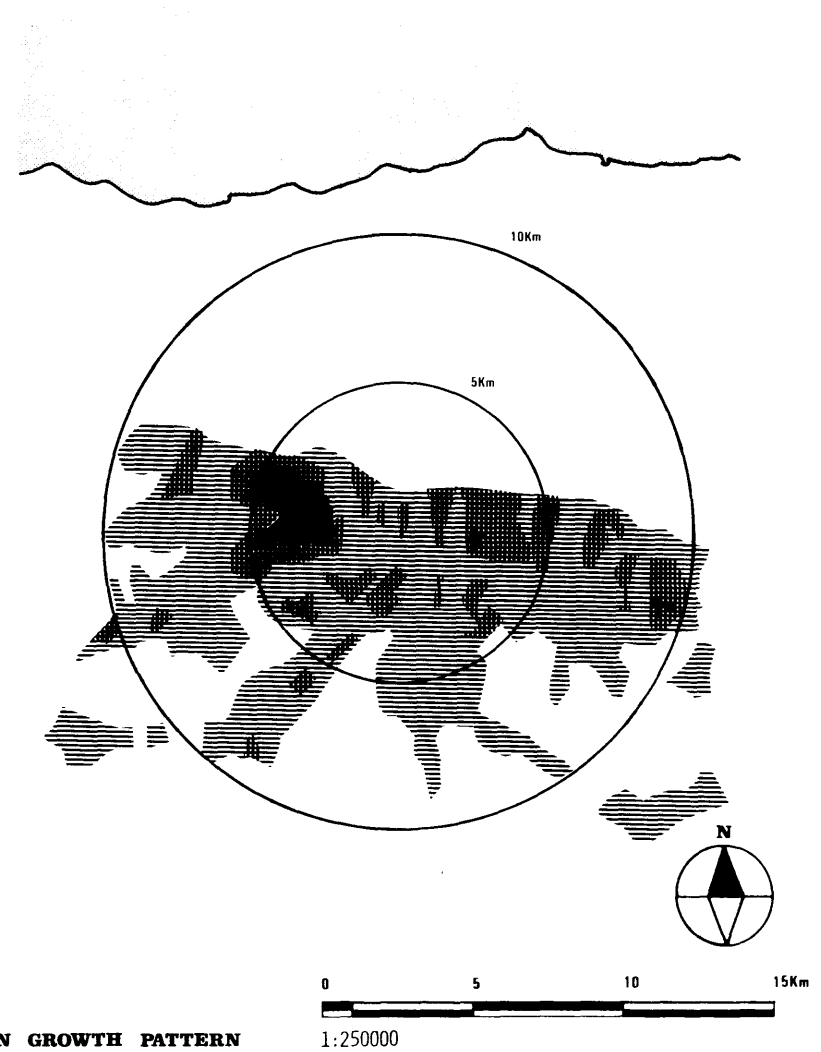
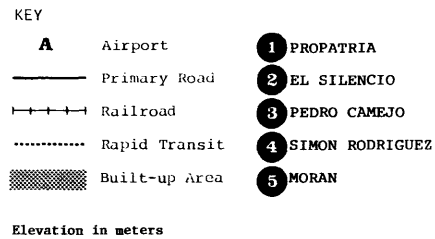
URBAN CONTEXT SOURCES

Topography and Circulation: (accurate) CARTOGRAFIA
Growth Pattern: (accurate) M.O.P. O.M.P.U.
Land Use Pattern: (approximate) M.O.P.
O.N.P.U. Field Surveys by the author, 1977-1978.
Density Pattern: (accurate) M.O.P. O.M.P.U.
Income Pattern: (accurate) M.O.P.
Land Value Pattern: (approximate) CATASTRO
General Information: "Estudio Central de Caracas" M.O.P. 1974
"Plan General Urbano de Caracas. O.M.P.U. 1970-1990.
"Plan Caracas. 1976.
Census 1970, Direccion general de Estadisticas.
Notes from State Department, 1975, U.S.A.
Area Handbook Venezuela.



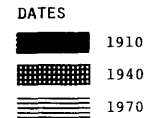
URBAN TOPOGRAPHY AND CIRCULATION

URBAN TOPOGRAPHY AND CIRCULATION: The valley of Caracas in which the city is located is 950 meters above sea level. It is bounded by two mountain ranges, the Avila to the north and the Costa to the south. The urban circulation pattern is defined by the commercial and business activities. The main highways flow in a east-west direction along the valley between the mountain ranges. These highways practically divide the city into two or three parts. Regional traffic is canalized to and from the main highways.

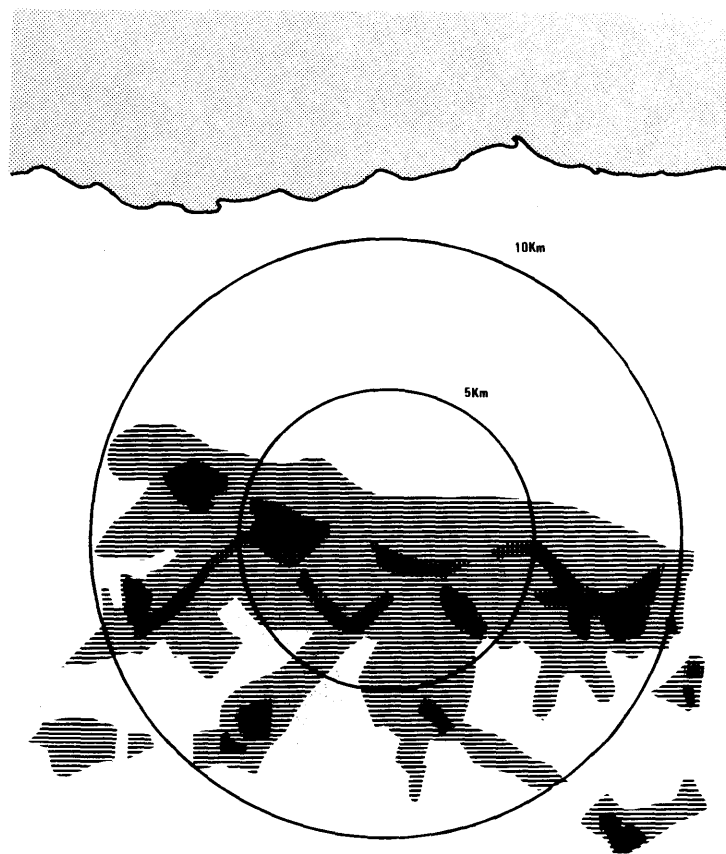


URBAN GROWTH PATTERN

URBAN GROWTH PATTERN: Urban growth almost was non-existent until 1920, when radical economic changes, strong migrations and extensive use of automobiles produced a rapid change in the urban structure. In 1940 the urban population was about 3 times more than 1920. By 1950 the population was almost double that 1940 and the 1960 population was 5 times more than that of 1940. This accelerating situation generated a rapid urbanization process that overcrowded almost all of the communities and urban facilities and created

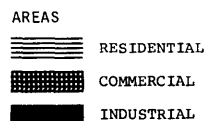


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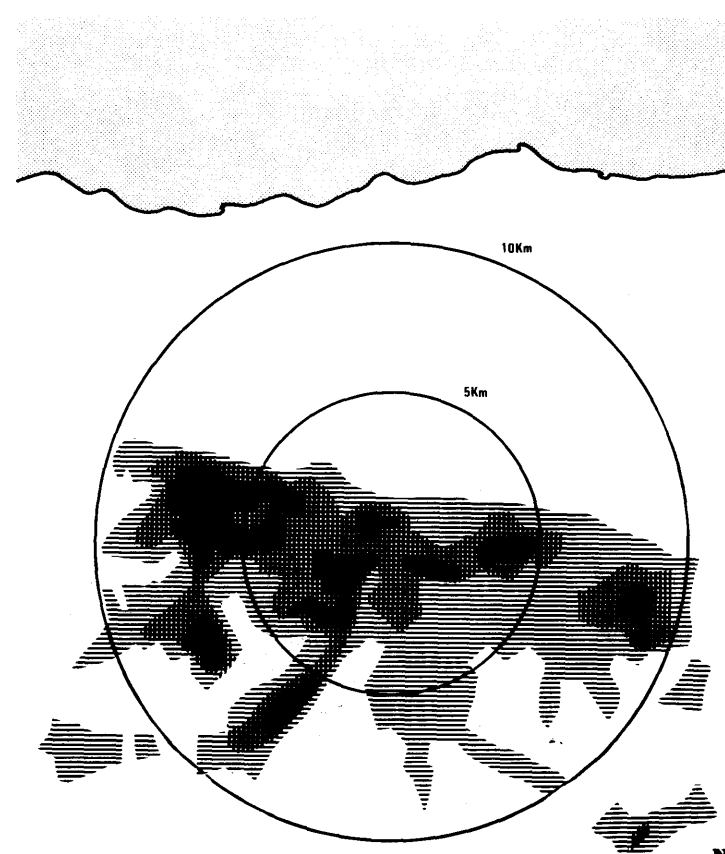
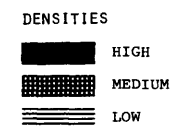
URBAN LAND USE PATTERN

URBAN LAND USE: Main commercial activities are concentrated in the city center and along principal avenues but some new shopping center areas are scattered throughout the city. The industrial areas are located basically in the western and eastern sides of the city, most industrial development occurs according to highway transportation facilities. Residential areas occupy the highest percentage of the total urban area of Caracas and squatter areas practically encircle the city.



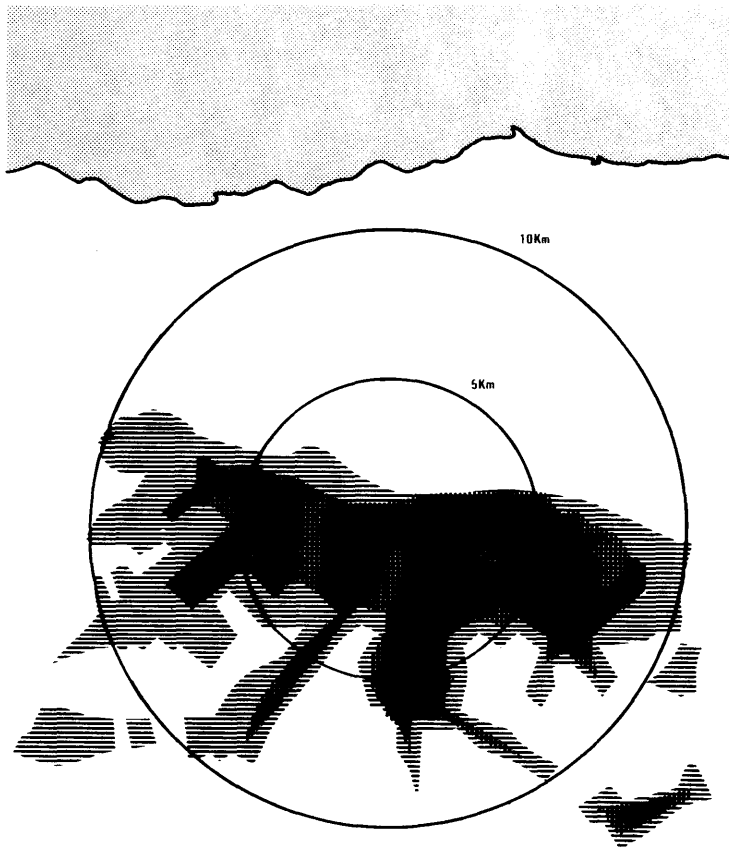
URBAN DENSITY PATTERN

URBAN DENSITY PATTERN: The density distribution is high around the historical center and along the major highways with a large concentration along the center of the valley. Characteristic of this area is high rise apartment buildings, tenements, old speculative developments and squatting areas. Medium densities are found in old high income developments and middle-income suburbs. Low densities are characterized by new high income suburbs. However future tendency is for increased densities.



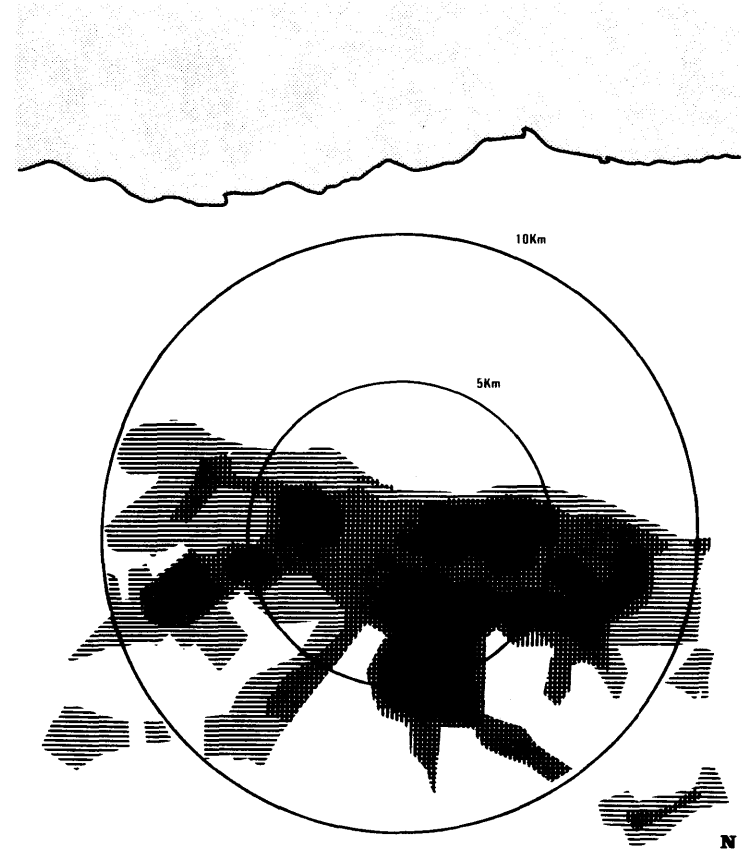
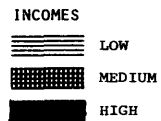
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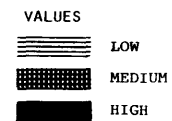
URBAN INCOME PATTERN

URBAN INCOME PATTERN: High and medium-high income groups are settled on the south-east and north-east sides of the city. Moderate-low and middle income groups are located in the center area of the valley along the major highways and in some peripheral new developments on the south-west and west sides of the city. Very low and low income groups are settled in the hills and in the inner ring predominately on the western side of the city.



URBAN LAND VALUE PATTERN

URBAN LAND VALUES: The land value follows a similar pattern to that of urban growth. High values are found in the historical center as well as along main commercial avenues and on the east side of the city. Medium values are concentrated in the center and north-west area area of the valley. Low and medium-low values are located around the city but primarily on the western side of the valley.



PHOTOGRAPH, OPPOSITE PAGE:
CARACAS. View: This photo was taken from Avila mountain in direction to east.



CASE STUDIES

The following section contains case studies describing selected public housing dwelling environments within the Caracas metropolitan area.

The five cases were selected in accordance with the income groups, housing systems and population densities. Four case studies are of public housing developments and one is of a popular development.

Each case study is represented at three levels:

LOCALITY SEGMENT: Because each locality has a different size and shape, a segment of 400 meters by 400 meters has been taken for comparative purposes.

LOCALITY BLOCK: Within each locality segment a typical residential block is selected in order to compare land utilization, densities, etc.

DWELLING UNITS: A typical dwelling unit is selected to show an example of a house in each locality.

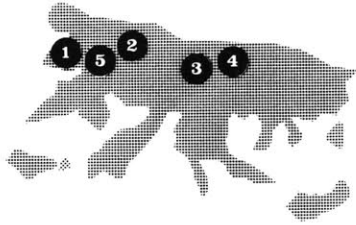
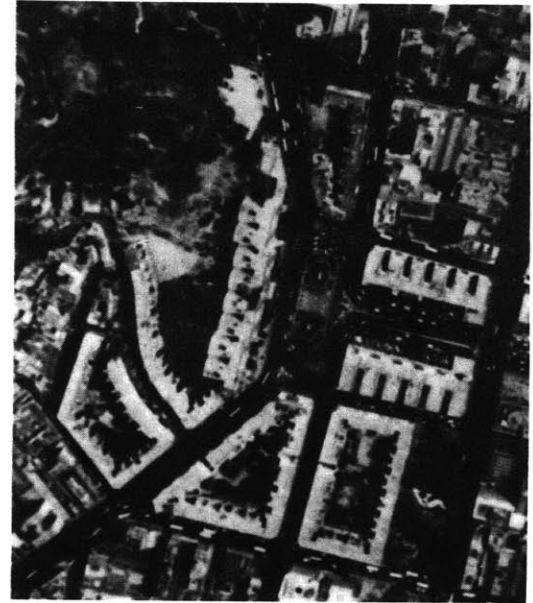
The case studies are arranged by locality as follows:

1. PROPATRIA: Row Houses.
2. EL SILENCIO: Walk up Apartments
3. PEDRO CAMEJO: Walk up Apartments
4. SIMON RODRIGUEZ: High Rise Apartments
5. MORAN: Squatter.

1 PROPATRIA



2 EL SILENCIO



3 PEDRO CAMEJO



4 SIMON RODRIGUEZ

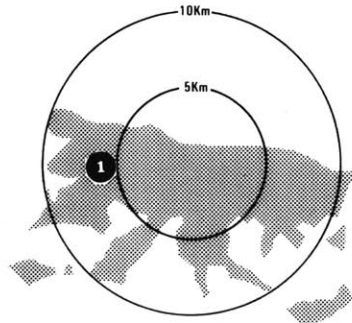


5 MORAN



1 PROPATRIA

PUBLIC, ROW HOUSES



LOCATION: Propatria is situated in the north-west section of Caracas and covers an area of approximately 50 hectares. It is located approximately 2 kilometers from the center of the city.

Fort Urdaneta provides the northern boundary and on the south is the Propatria Hill, another public development. To the west is the Moran squatter area and to the east are several other squatter areas.

ORIGINS: Propatria originated in response to the high demand of low and medium income groups for housing. The government developed this project in 1946 through the aid of the Workers Bank (Banco Obrero).

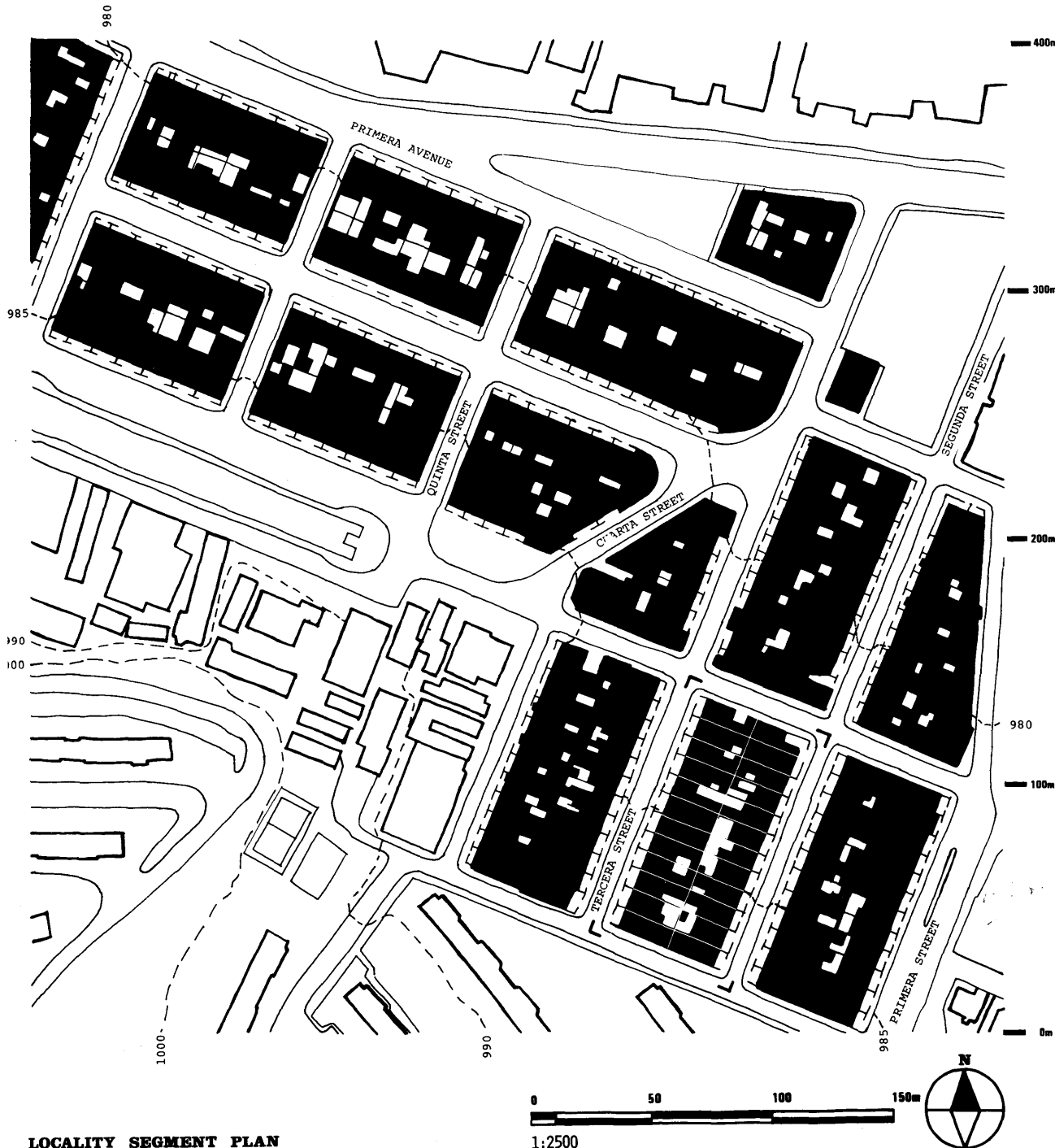
The land is subdivided into individual lots each containing a row house which is the characteristic dwelling type of this project. These houses are one story high and are provided with utilities and other basic services.

LOCALITY SEGMENT: The selected segment is essentially residential, showing that land coverage is quite high with an almost lack of open spaces. At this scale it is possible to see how the people have changed their houses in response to a need for more dwelling area within a limited space. This situation is reflected in the near elimination of yards and the rise of two story structures behind the one story row houses.



LOCALITY SEGMENT AIR PHOTOGRAPH

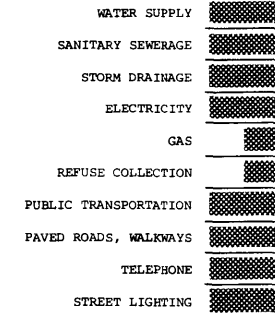




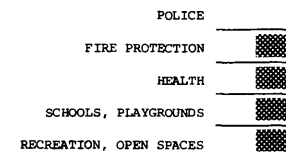
LOCALITY SEGMENT PLAN

1:2500

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

SELECTED BLOCK

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	267	13.35	20
DWELLING UNITS	261	13.35	20
PEOPLE	1566	13.35	117
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)		3.0	22
SEMI-PUBLIC (open spaces, schools, community centers)		1.5	12
PRIVATE (dwellings, shops, factories, lots)		8.8	66
SEMI-PRIVATE (cluster courts)			
TOTAL		13.35	100

NETWORK EFFICIENCY

Network length (streets, walkways) = 193 m/Ha
 Areas served (total area)

LAYOUT: The layout of the Propatria urban development consists of traditional rectangular blocks with some minor changes introduced to accommodate the topography and circulation network. The streets are from 10 to 12 meters wide and are used extensively by pedestrians and vehicular traffic. Propatria's boundaries are clearly defined as in each direction one encounters a humanly constructed barrier. To the north extends Propatria Avenue, the major artery which separates the project from a small light industrial area and commercial area. To the south Decima Street acts as a barrier dividing the project from a new public development. Similar situations can be found in relation to the east and west sides of the development through the presence of Doce and Primera Streets.

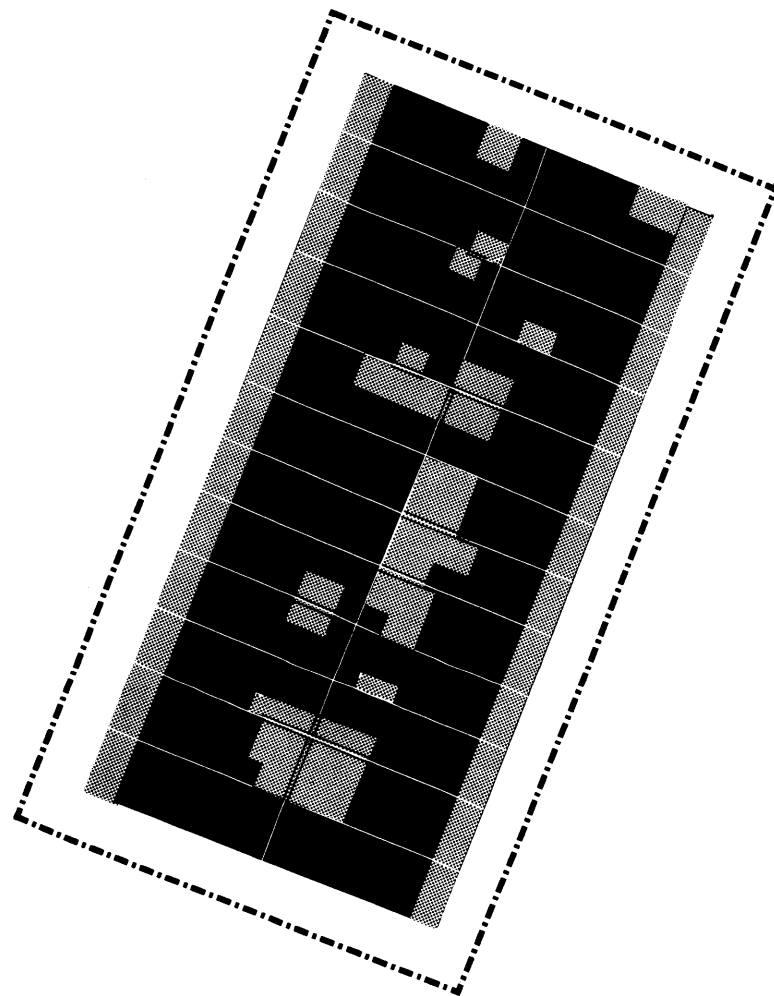
LAND USE: The primary use of the land is residential combined with some small commercial and industrial activities. Open spaces can be found scattered throughout the locality. Field observations indicate that the selected site of Propatria project is entirely free of industry and there is no clear definition of the utilization of open spaces. The main dwelling types are row houses with a majority of the houses consisting of 1 to 2 stories. The site is provided with complete utilities.

CIRCULATION: Most of the vehicular and pedestrian traffic moves in an east-west direction. Major vehicular access is gained from Propatria Avenue, an important artery to this project. All the streets are paved with narrow sidewalks. The streets are of two different widths, one of 12 meters and the others of 8 meters. Field observations indicate that the lack of open spaces within the locality encourages children to play in the streets. There is a regular public transportation system which connects with the city center in 45 minutes. However, most of the people own cars.

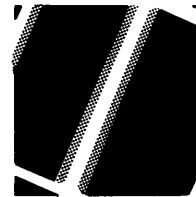
PHOTOGRAPHS,
PROPATRIA: (top and bottom) Typical residential street.



LAND UTILIZATION DIAGRAMS



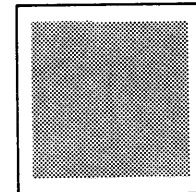
1 Hectare



PATTERN

- Public: streets, walkways
- Private: lots
- dwellings

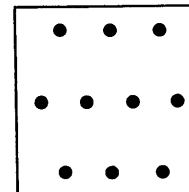
1 Hectare



PERCENTAGES

- Streets/Walkways 30%
- Playgrounds -
- Cluster Courts -
- Dwellings/Lots 70%

1 Hectare

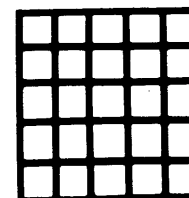


DENSITY

Persons/Hectare 203

● 20 Persons

16 Hectares



Circulation efficiency 246 m/Ha

BLOCK: The typical block is approximately 0.5 hectares, measuring about 100 meters by 50 meters. The average lot size is 25 meters by 8.5 meters. This lot size determined the network intervals of public circulation and a high infrastructure construction and maintenance cost. This also created a waste of land which could have provided more lots. In each lot there is a single row house of about 96 square meters. Many of these houses have undergone changes as owners have altered the structures to accommodate the changing needs of each family.

POPULATION-INCOME: The majority of the population consists of moderate and low income level people. Many residents of this project are foreign immigrants as well as many migrants from rural areas who have been living in the city for many years. A high percentage of the population is public employees with an income range from U.S.\$ 216.00 to 402.00 per month. In some cases the income exceeds this range as more than one of the family members is employed.

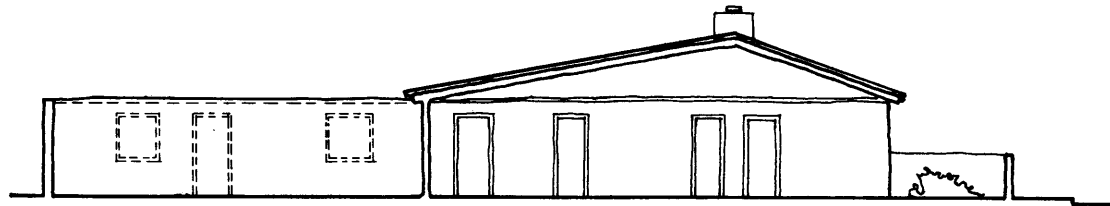
LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	24	.71	33
DWELLING UNITS	24	.71	33
PEOPLE	144	.71	203

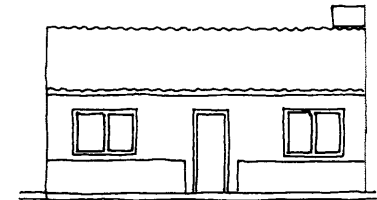
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	.21	30
SEMI-PUBLIC (open spaces, schools, community centers)		
PRIVATE (dwellings, shops, factories, lots)	.5	70
SEMI-PRIVATE (cluster courts)		
TOTAL	.7	100

NETWORK EFFICIENCY
 Network length (streets, walkways) = 246 Mts/Ha
 Areas served (total area)

LOTS
 Average area, dimensions = 212 , 25 x 8.5 m



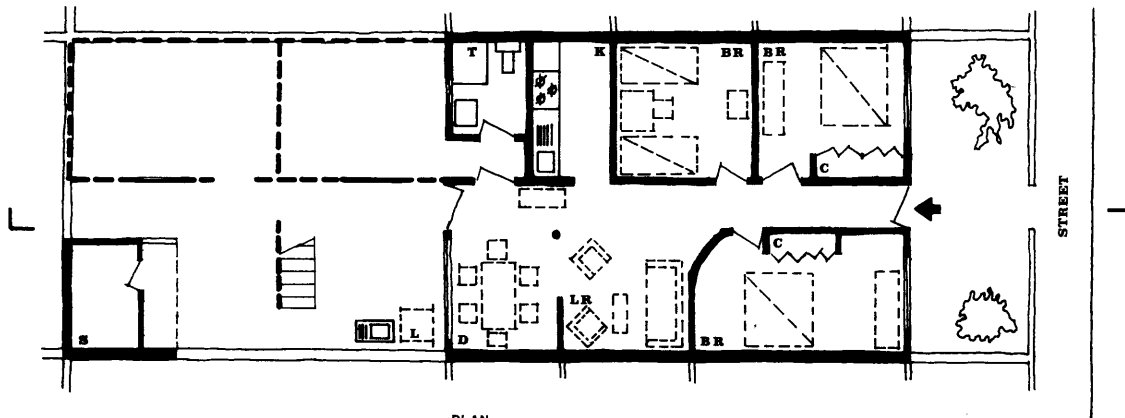
SECTION



ELEVATION

KEY

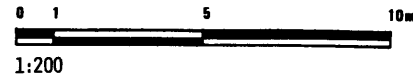
- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- ▬ Addition



PLAN

CASE STUDY SOURCES

- Plan: (approximate) PLAN CARACAS, CARTOGRAFIA. Air photographs and plans, 1976.
- Field survey 1977-1978.
- Segment Plan: (approximate) PLAN CARACAS
- Block Plan: (accurate) PLAN CARACAS, CATASTRO.
- Typical Dwelling: (approximate) Field survey 1977-1978.
- Physical Data: (approximate) Field survey 1977-1978
- Photographs: The author 1977-1978-1979.
- Other Information: Field survey 1977-1978.
- B.O. Banco Obrero reports
- I.N.A.V.I. Instituto Nacional de Vivienda reports 1977.
- Gobernacion de Caracas.



TYPICAL DWELLING

PHYSICAL DATA

(related to dwelling and land)

DWELLING UNIT

type: Row House
 area (sq m): 103
 tenure: Legal Ownership

LAND/LOT

utilization: Private
 area (sq m): 212
 tenure: Legal Ownership

DWELLING

location: Inner Ring
 type: Row / Grouped
 number of floors: 1
 utilization: Single Family
 physical state: Good

DWELLING DEVELOPMENT

mode: Instant
 developer: Public
 builder: Large Contractor
 construction type: Masonry / Concrete
 year of construction: 1946

MATERIALS

foundation: Reinforce Concrete
 floors: Cement
 walls: Masonry
 roof: Reinforce Concrete

DWELLING FACILITIES

wc: 1
 shower: 1
 kitchen: 1
 rooms: 3
 other: Yard

SOCIO-ECONOMIC DATA

(related to user)

GENERAL: SOCIAL

user's ethnic origin: Central Venezuelan
 place of birth: Caracas D.F.
 education level: Prymary

NUMBER OF USERS

married: 2
 single: 4
 children: 4
 total: 6

MIGRATION PATTERN

number of moves: N.A
 rural - urban: N.A
 urban - urban: 1955
 urban - rural: N.A

why came to urban area:

GENERAL: ECONOMIC

user's income group: Moderate
 employment: Office Clerk
 distance to work: 3 Km
 mode of travel: Public Transportation
 COSTS US\$
 dwelling unit: \$ 9.465
 land - market value: \$ 5.497

DWELLING UNIT PAYMENTS

financing: Public
 rent/mortgage: -
 income for rent/mortgage: -

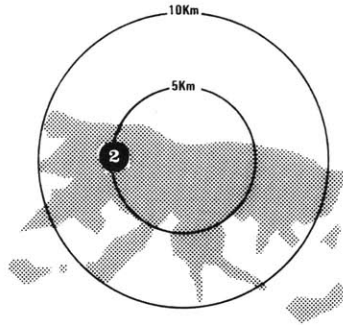
PHOTOGRAPHS:

PROPATRIA: (top) Street adjacent to the plaza,
 (right) A living-room in a single family unit. (left)
 A patio in one house.



2 EL SILENCIO

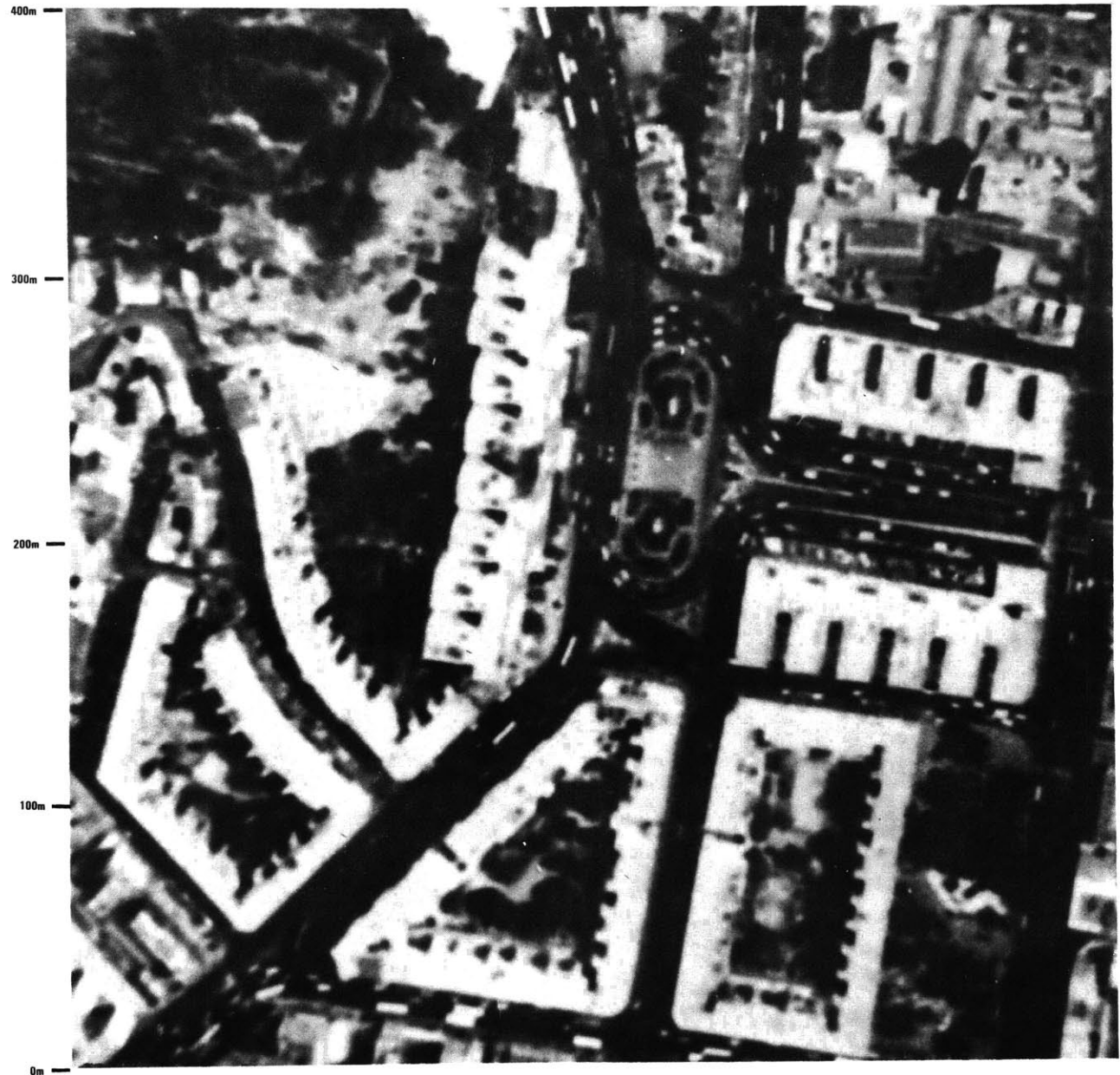
PUBLIC, WALK-UP APARTMENTS



LOCATION: El Silencio is located in the central area of Caracas. It is within the Federal District Area and covers an area of approximately 11.1 hectares.

Its boundaries on the north are Sucre Avenue and the Calvario Park. This avenue connects with a highway which goes to the International Airport. To the south is a commercial development and a speculative residential area. To the west the boundary abuts with another public housing project called El 23 de Enero. And to the east is the Centro Simon Bolivar, a large commercial-office center.

ORIGINS: El Silencio is one of the oldest public housing projects developed in Caracas. It was begun in 1941 under a national program of the Workers Bank, (Banco Obrero). But it was not until 1943 that the project was completed. For many, the construction of this project was considered as record as it occurred during the World War II. Originally, the area of El Silencio was a dangerous prostitution center. For this reason and because of its proximity to the historical center of the capital city, the government decided to renew this area. The design project was carried out by Architect Carlos Raul Villanueva. This project reflects the European design norms of the 1940's. However, the project exhibits an unusual consideration of the relationship between humans and the city which is reflected in the characteristic feature of the project, the beautiful garden

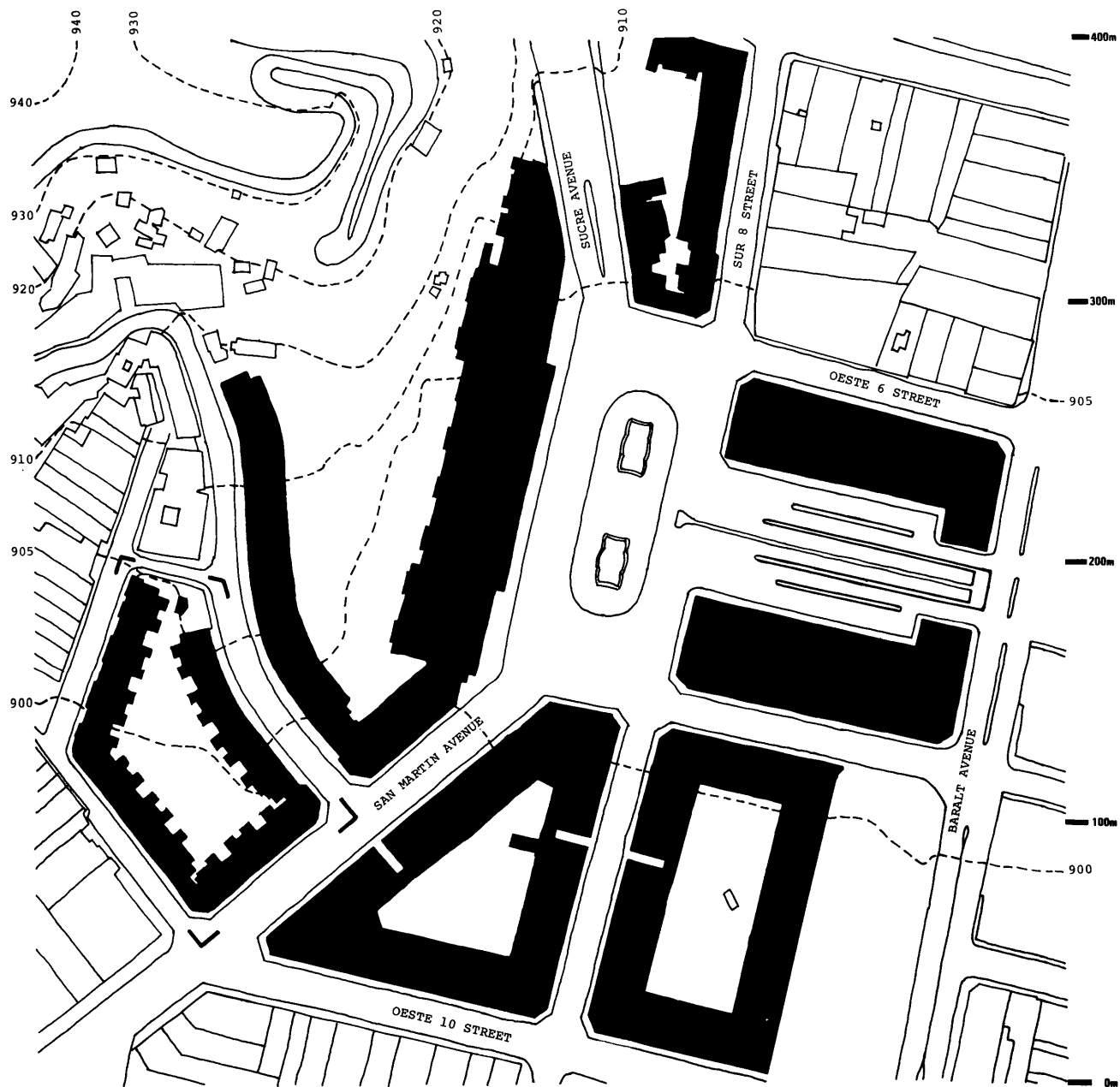


LOCALITY SEGMENT AIR PHOTOGRAPH

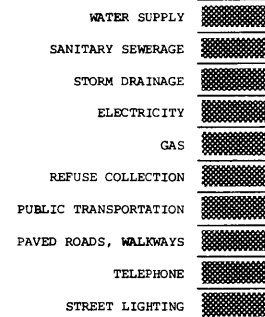


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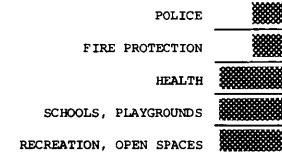




LOCALITY UTILITIES AND SERVICES



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

SELECTED BLOCK []

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	7	11.10	.63
DWELLING UNITS	747	11.10	67
PEOPLE	4632	11.10	417
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)		4.3	38
SEMI-PUBLIC (open spaces, schools, community centers)			
PRIVATE (dwellings, shops, factories, lots)		4.5	41
SEMI-PRIVATE (cluster courts)		2.4	21
TOTAL		11.10	100

NETWORK EFFICIENCY

Network length (streets, walkways) = 151 mts/Ha
 Areas served (total area)

LOCALITY SEGMENT PLAN

1:2500

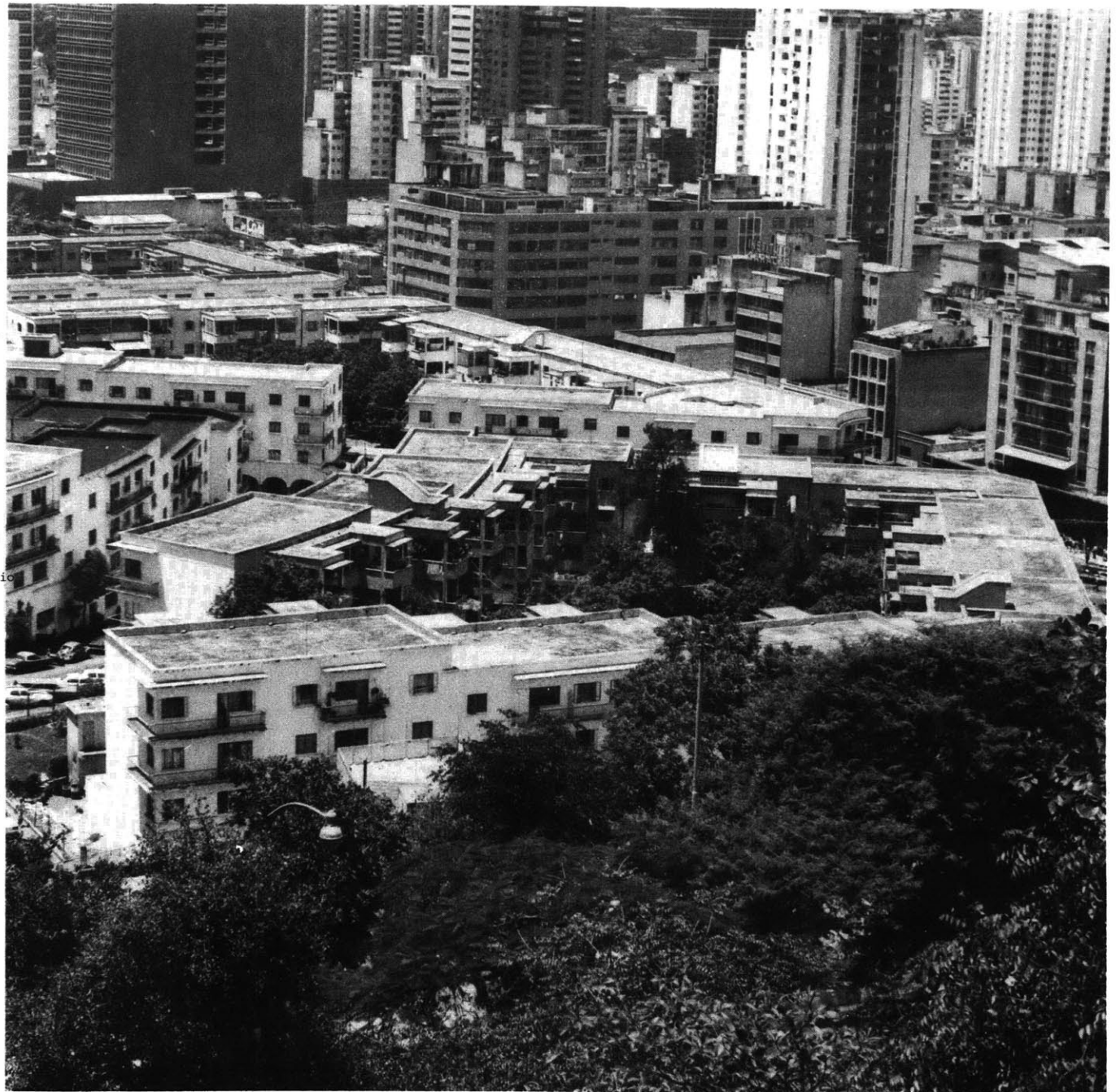
and parks inside of the block designed for semiprivate and communal uses. The project has been considered one of the best examples of the public housing built in Caracas City.

LOCALITY SEGMENT: The segment area shows clearly the relationship between public areas, private areas and semiprivate areas, and demonstrates that private areas occupy a high percentage of the land. The segment also shows how private areas create a barrier that allows private control of the semiprivate areas. But field observations indicate that those areas require more maintenance and that some small shops in the ground floor produce noise and odor that affect the dwelling apartments in the upper floors. Also no provision of parking areas for the community creates a chaotic situation during the heavy traffic which is especially present in this areas during the day.

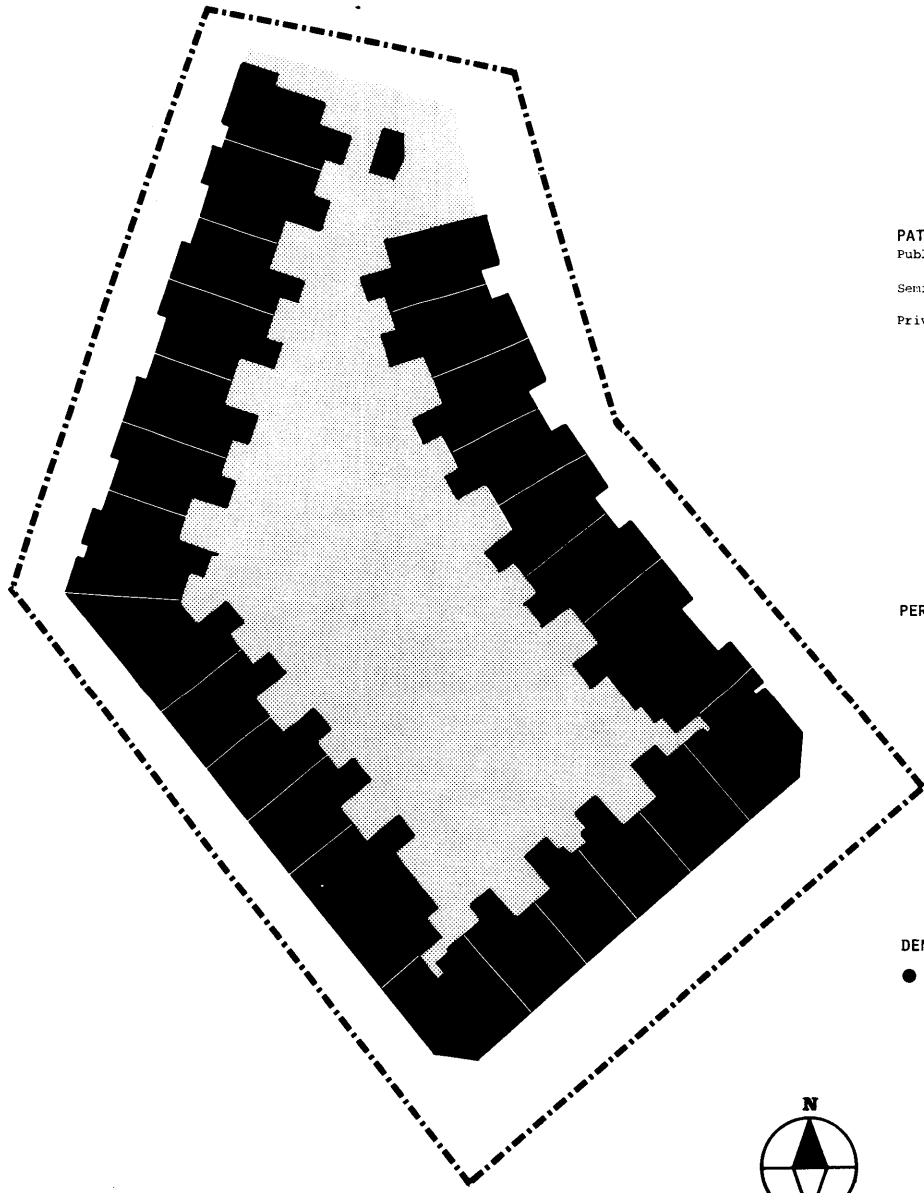
LAYOUT: The area of the city where the project is located has been influenced by many different factors. Mainly this area reflected the Spanish layout based on square blocks of about 100 meters by 100 meters. The El Silencio area was built in a major intersection of three avenues, which lead to almost every area of the country. One of these avenues goes to west side of the city and connects with major highway leading to the west side of the country. The same situation is found in relation to the other avenues but in east and south directions. This major intersection was taken into consideration when the project was designed and is clearly reflected in the location of the buildings. The layout follows the pattern of the avenues.

In general, most of the commercial areas are located in the ground floor of each building which has created a strong movement of people along the sidewalk. In relation to the surrounding area, the area of the blocks within the project are very large.

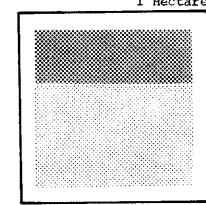
LAND USE: Most of the land in this project is under residential use, including the commercial areas which are located on ground floor of the residential buildings. The major location of activities is in front of the Olearly Plaza as this space is the stopping area and junction for the public and private



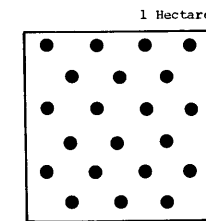
LAND UTILIZATION DIAGRAMS



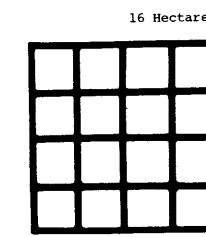
PATTERN
 Public: streets, walkways
 Semi-Private: cluster courts
 Private: lots
 dwellings



PERCENTAGES
 Streets/Walkways 25%
 Playgrounds -
 Cluster Courts 50%
 Dwellings/Lots 25%



DENSITY
 Persons/Hectare 421
 ● 20 Persons



Circulation efficiency 201 m/Ha

Much land is devoted to open spaces and semiprivate use. The main dwelling type is mostly a four story walk-up apartments. The site is provided with all utilities as well as scattered community services providing a small school and medical center.

CIRCULATION: The project is located in the center of an intersection of the main avenues of the city. The project was built around this intersection and its design reflects and adaptation to those circulation patterns. These avenues have a width of approximately 20 to 30 meters with a sidewalk of about 2 to 4 meters wide. They carry the main vehicular and pedestrian traffic of the center of Caracas. Heading in a south-west direction is San Martin Avenue, to the north-west is Sucre and to the east is Bolivar Avenue.

BLOCK: The typical block is approximately 1.2 hectares with no specific lots as it is composed of a continuous building consisting of apartments approximately 100 square meters. The semiprivate area is located in the center of the block and is bounded by a walkway of about 2 meters wide. This walkway connects the semiprivate areas with the main and secondary streets. It is important to notice that all houses have a huge balcony overhanging the semiprivate areas. This creates a possible control for this area, however the lack of control of access promotes many acts of vandalism especially during the night.

LOCALITY BLOCK LAND UTILIZATION DATA

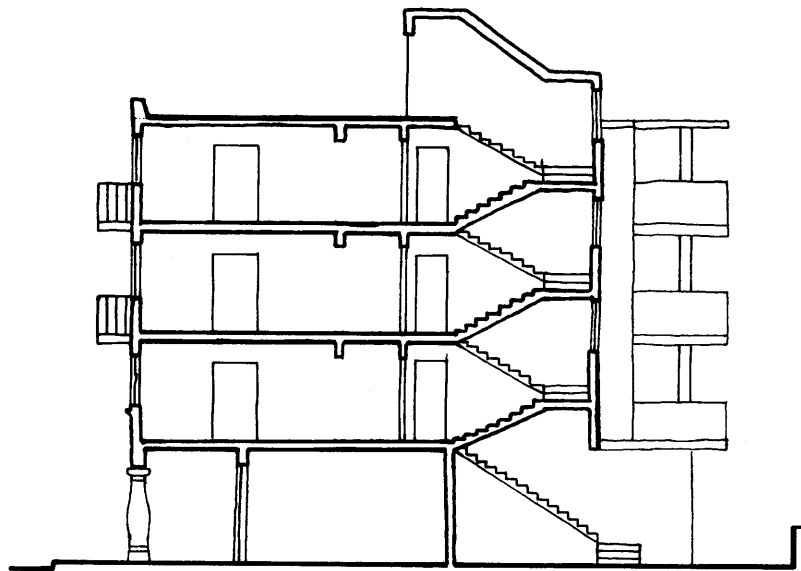
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	1	1.31	.76
DWELLING UNITS	100	1.31	76
PEOPLE	551	1.31	421

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	.33	25
SEMI-PUBLIC (open spaces, schools, community centers)		
PRIVATE (dwellings, shops, factories, lots)	.33	25
SEMI-PRIVATE (cluster courts)	.65	50
TOTAL	1.31	100

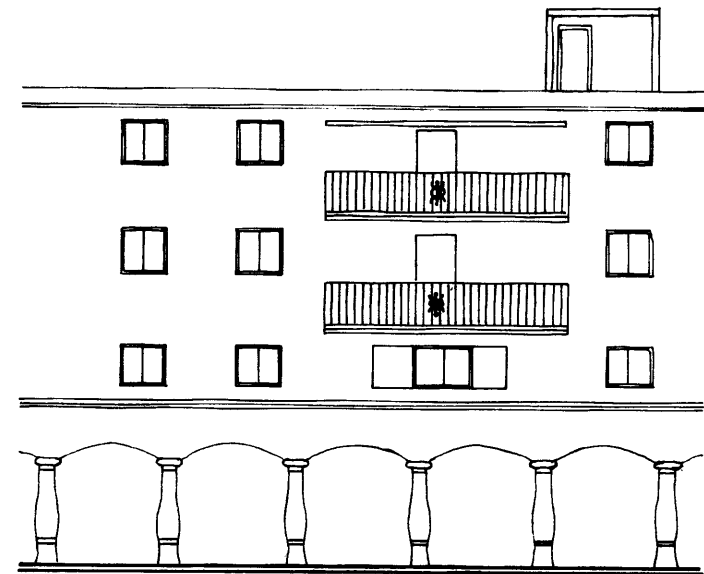
NETWORK EFFICIENCY
 Network length (streets, walkways) = 201 m/Ha
 Areas served (total area)

LOTS
 Average area, dimensions = 10,080 , 140 x 72 m

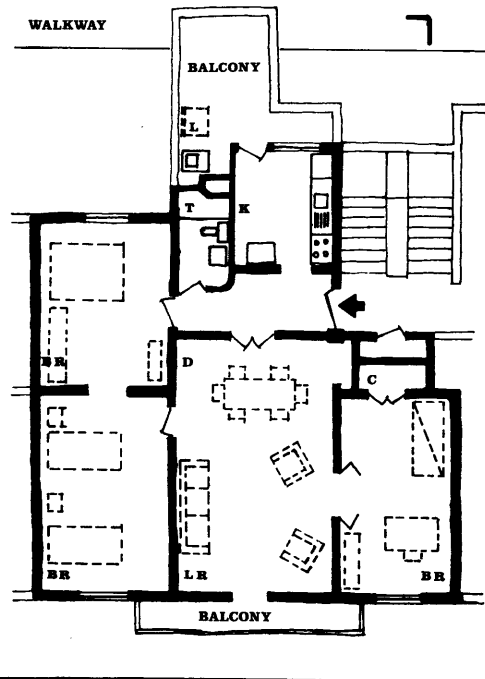
PHOTOGRAPH OPPOSITE PAGE:



SECTION



ELEVATION



PLAN

TYPICAL DWELLING

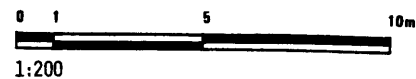
KEY

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

POPULATION-INCOME: The population is a mixture of the different income levels but a majority represent the low and middle income people who earn a salary between U.S.\$ 250.00 to U.S.\$ 750.00 per month. Originally this project was subsidized by the official institution, (Banco Obrero), and income selection criteria was based upon the minimum salary of the public government employee. Now many apartments are owned and in turn placed under a rental system. However, it is important to notice that solution of public housing was never used for very low income people as they could not afford the cost of these apartments.

CASE STUDY SOURCES

- Plan: (approximate) PLAN CARACAS, CARTOGRAFIA. Air photographs and plans, 1976.
- Field survey 1977-1978
- Segment Plan: (approximate) PLAN CARACAS
- Block Plan: (accurate) PLAN CARACAS, CATASTRO.
- Typical Dwelling: (approximate) Field survey 1977-1978
- Physical Data: (approximate) Field survey 1977-1978
- Photographs: The author 1977-1978-1979.
- Other Information: Field survey 1977-1978.
- B.O. Banco Obrero reports
- I.N.A.V.I. Instituto Nacional de Vivienda reports 1977.
- Gobernacion de Caracas.



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
 type: Apartment
 area (sq m): 94.41
 tenure: Legal Ownership

LAND/LOT
 utilization: Private
 area (sq m): -
 tenure: Legal Condominium

DWELLING
 location: City Center
 type: Walk Up
 number of floors: 4
 utilization: Single Family
 physical state: Good

DWELLING DEVELOPMENT
 mode: Instant
 developer: Public
 builder: Large Contractor
 construction type: Masonry / Concrete
 year of construction:

MATERIALS
 foundation: Reinforce Concrete
 floors: Cement
 walls: Masonry
 roof: Reinforce Concrete

DWELLING FACILITIES
 wc: 1
 shower: 1
 kitchen: 1
 rooms: 2
 other: Balcony



SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
 user's ethnic origin: Northern Venezuelan
 place of birth: El Cafe, Miranda
 education level: Secondary

NUMBER OF USERS
 married: 2
 single: -
 children: 3
 total: 5

MIGRATION PATTERN
 number of moves: 6
 rural - urban: 1951
 urban - urban: 1953
 urban - rural: 1960
 why came to urban area: Employment

GENERAL: ECONOMIC
 user's income group: Medium
 employment: Public Employed
 distance to work: 1.5 Km
 mode of travel: Public Transportation

COSTS
 dwelling unit: \$ 8.100
 land - market value: -

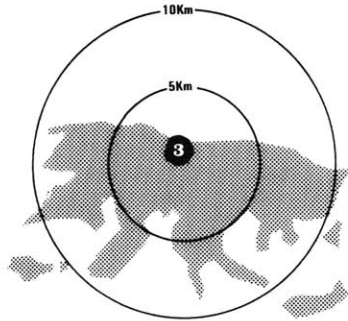
DWELLING UNIT PAYMENTS
 financing: Public
 rent/mortgage: \$ 66 / Month
 income for rent/mortgage: 12 %



PHOTOGRAPHS:
 EL SILENCIO: (top) Commercial street in front of the project. (left) Semiprivate garden inside of the block. (right) Living-room in a single family dwelling.

3 PEDRO CAMEJO

PUBLIC, WALK-UP APARTMENTS



LOCATION: The development of Pedro Camejo is located in the north-central section of the Caracas Valley. It is approximately 1.5 kilometers from the center of the city and covers an area of about 9.5 hectares. Boyaca Avenue provides boundaries for Pedro Camejo on the north and west. To the south the Real Sarria Street and to the east the Real del Cortijo Street provide the boundaries. This development has an excellent view of the Avila Mountains, which can be seen on the north side of the project beyond Boyaca Avenue.

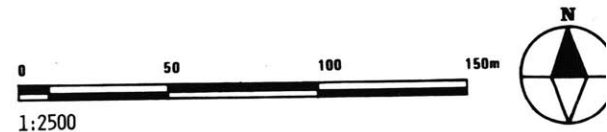
ORIGINS: On the southern edge of the area of study, a middle income development of row houses called Sarria became, during the early fifties, a tenement area for low-income migrants.

The excess of migrant population then became established in the area of Pedro Camejo in the form of squatter settlements with all the accompanying sanitary and living conditions characteristic of this kind of development. In 1955 the government decided to renew this area in the form of a large public housing project which was completed by 1957.

LOCALITY SEGMENT: The selected segment shows clearly the relationship between the private and public areas and indicates how the blocks are defined. Also shown is the



LOCALITY SEGMENT AIR PHOTOGRAPH





LOCALITY UTILITIES AND SERVICES

- WATER SUPPLY
- SANITARY SEWERAGE
- STORM DRAINAGE
- ELECTRICITY
- GAS
- REFUSE COLLECTION
- PUBLIC TRANSPORTATION
- PAVED ROADS, WALKWAYS
- TELEPHONE
- STREET LIGHTING

LOCALITY COMMUNITY FACILITIES

- POLICE
- FIRE PROTECTION
- HEALTH
- SCHOOLS, PLAYGROUNDS
- RECREATION, OPEN SPACES

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

Quality of information: Approximate

SELECTED BLOCK []

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	16	4.34	4
DWELLING UNITS	552	4.34	127
PEOPLE	3312	4.34	763
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)		.96	22
SEMI-PUBLIC (open spaces, schools, community centers)		.43	10
PRIVATE (dwellings, shops, factories, lots)		2.95	68
SEMI-PRIVATE (cluster courts)			
TOTAL		4.34	100

NETWORK EFFICIENCY

Network length (streets, walkways) = 132 mts/Ha
 Areas served (total area)

LOCALITY SEGMENT PLAN

1:2500

network of special pedestrian roads within the public spaces. Another important aspect shown in the segment is the clear definition of vehicular circulation and how the roadways enter the project. Upon examination of this segment, one can gain an appreciation for the land utilization in relation to the public and private areas.

LAYOUT: The layout of Pedro Camejo reflects a high use of the land. The design of the project consists of parallel buildings of four floors high which generate open spaces between the buildings, circulation, and gardens. These buildings exhibit a close relationship with the topographical conditions. All circulation within the project is pedestrian. However, a parking area may be found adjoining every tenth or eleventh building. The blocks are generally rectangular in shape and the orientation of the lots is of an east-west direction. Field observations show that the residents take care of those open spaces such as playgrounds and gardens.

LAND USE: A majority of the land is under residential use, however some commercial, small industrial and educational activities may be found on the main streets. The semi-public spaces, which mainly consist of parking areas, are defined in an area by the adjacent lots and buildings. Streets and pedestrian roads are smaller in proportion to private and semipublic spaces.

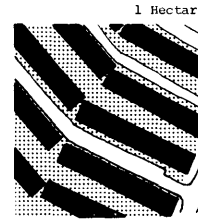
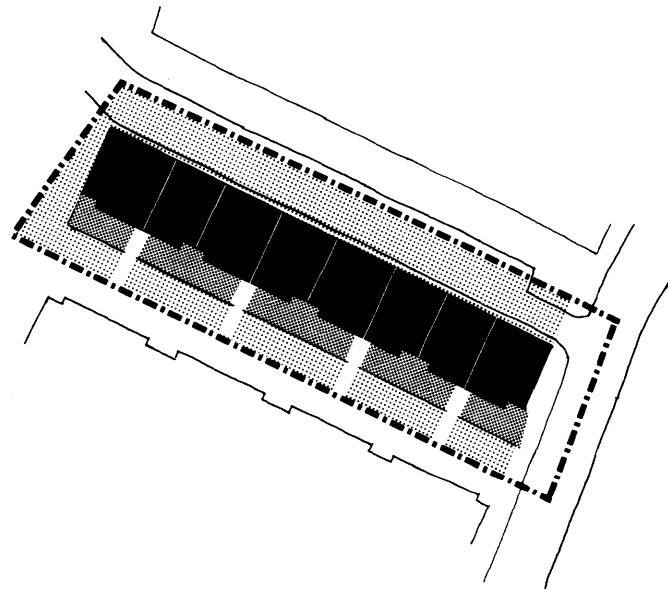
This project is free of all heavy industrial areas and is provided with all utilities and community services.

CIRCULATION: Circulation within this development is primarily pedestrian with sidewalks and walkways connecting all the buildings, open spaces and semipublic school areas. Vehicular circulation is perimetral and runs along the Real Cortijo Street. The vehicular circulation within the project connects only with the parking areas. The width of pedestrian circulation is 1.5 meters with vehicular circulation approximately 8 meters wide.

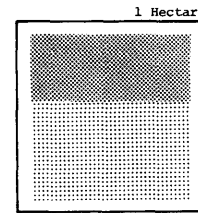
PHOTOGRAPHS:
PEDRO CAMEJO: (top) View from the mountain showing the Main street and location of the building, (bottom) The Main street in the direction of north.



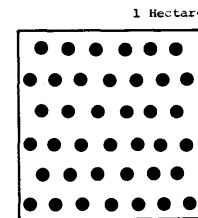
LAND UTILIZATION DIAGRAMS



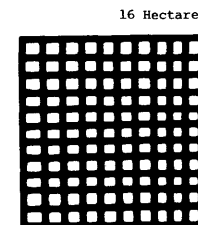
PATTERN
 Public: streets/walkways [white box]
 Semi-Public: playgrounds [dotted box]
 Private: lots [stippled box]
 dwellings [solid black box]



PERCENTAGES
 Streets/Walkways 22%
 Playgrounds 48%
 Cluster Courts -
 Dwellings/Lots 30%



DENSITY
 Persons/Hectare 780
 ● 20 Persons



Circulation efficiency 510 m/Ha



1:1000

LOCALITY BLOCK LAND UTILIZATION

BLOCK: The block is defined by the pedestrian circulation which runs in a parallel direction and perpendicular at both ends of the buildings. The latter walkways follow the same direction of the contour lines, respecting the topographical conditions of the site. Each building forms an independent unit connected by way of the pedestrian circulation network with adjacent buildings. Because of this independence of each structure, there is generated an increase in the cost and maintenance of the infrastructure. The dispersion between buildings necessitates separate linkages with all public utilities.

It is important to mention that because of the low-rise nature of the buildings and the characteristic layout of adjacent land, a sense of community ownership has been established over the semipublic areas. The impact in terms of maintenance and cleanliness is highly positive.

POPULATION-INCOME: All surveys show that there are a great variety of social groups within this project ranging from the low to middle income levels. However, in general, the predominant group is the moderate income level people with occupations such as public worker, technicians and a few professional. They earn from U.S.\$ 154 to U.S.\$ 375 per month.

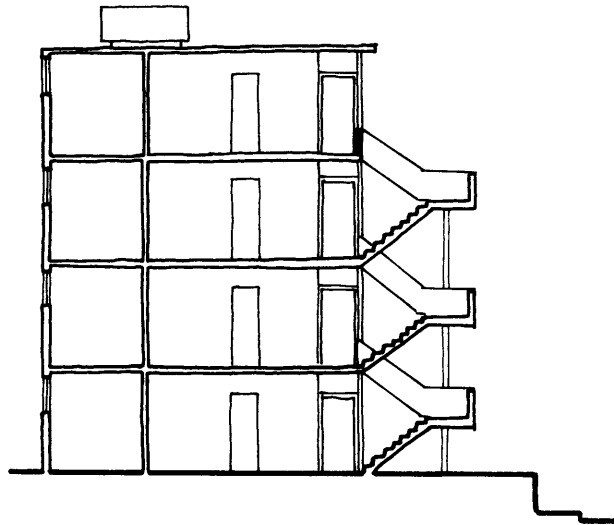
LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	1	.19	5
DWELLING UNITS	32	.19	168
PEOPLE	148	.19	780

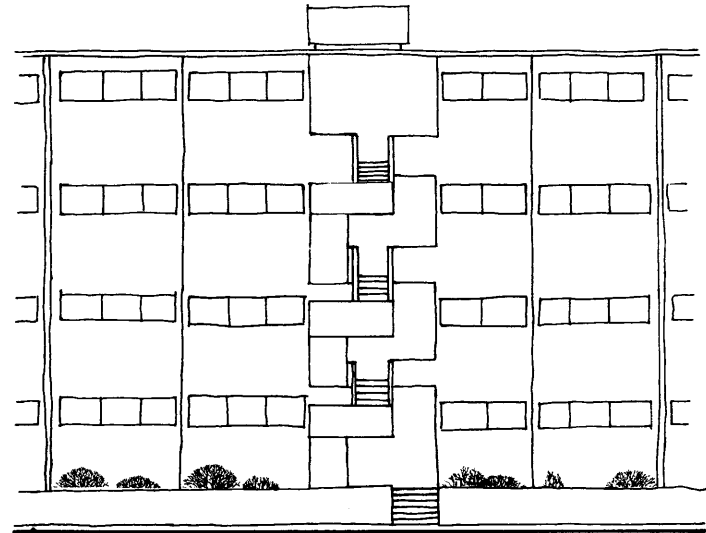
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	.041	22%
SEMI-PUBLIC (open spaces, schools, community centers)	.091	48%
PRIVATE (dwellings, shops, factories, lots)	.057	30%
SEMI-PRIVATE (cluster courts)		
TOTAL	.19	100

NETWORK EFFICIENCY
 Network length (streets, walkways) = 510 Mts/Ha
 Areas served (total area)

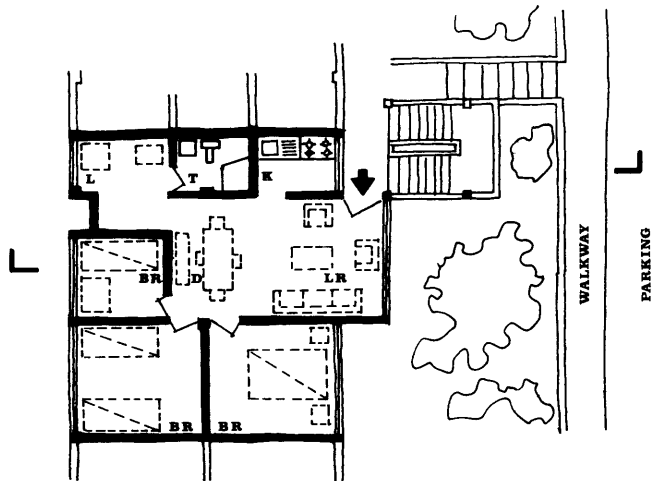
LOTS
 Average area, dimensions = 1900 , 76 x 25 m



SECTION



ELEVATION



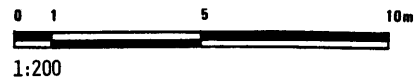
PLAN

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry

CASE STUDY SOURCES

Plan: (approximate) PLAN CARACAS, CARTOGRAFIA. Air photographs and plans, 1976.
 Field survey 1977-1978.
 Segment Plan: (approximate) PLAN CARACAS
 Block Plan: (accurate) PLAN CARACAS, CATASTRO.
 Typical Dwelling: (approximate) Field survey 1977-1978
 Physical Data: (approximate) Field survey 1977-1978
 Photographs: The author 1977-1978-1979.
 Other Information: Field survey 1977-1978.
 B.O. Banco Obrero reports
 I.N.A.V.I. Instituto Nacional de Vivienda reports 1977.
 Gobernacion de Caracas.



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
 type: Apartment
 area (sq m): 66
 tenure: Legal Ownership/Rental

LAND/LOT
 utilization: Private
 area (sq m): -
 tenure: Legal Condominium

DWELLING
 location: Inner Ring
 type: Walk Up
 number of floors: 4
 utilization: Single Family
 physical state: Good

DWELLING DEVELOPMENT
 mode: Instant
 developer: Public
 builder: Large Contractor
 construction type: Masonry/Concrete
 year of construction: 1956

MATERIALS
 foundation: Reinforce Concrete
 floors: Cement
 walls: Masonry
 roof: Reinforce Concrete

DWELLING FACILITIES
 wc: 1
 shower: 1
 kitchen: 1
 rooms: 3
 other: -



SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
 user's ethnic origin: North-West Venezuelan
 place of birth: San Felipe Yaracuy
 education level: Primary

NUMBER OF USERS
 married: 2
 single: 1
 children: 2
 total: 4

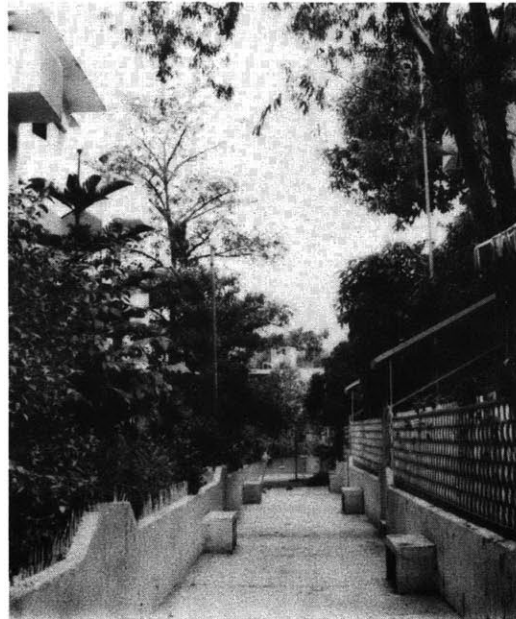
MIGRATION PATTERN
 number of moves: 2
 rural - urban: 1963
 urban - urban: 1971
 urban - rural:
 why came to urban area: Employment

GENERAL: ECONOMIC
 user's income group: Moderate
 employment: Salesman
 distance to work: 5 km
 mode of travel: Public Transportation

COSTS
 dwelling unit: -
 land - market value: -

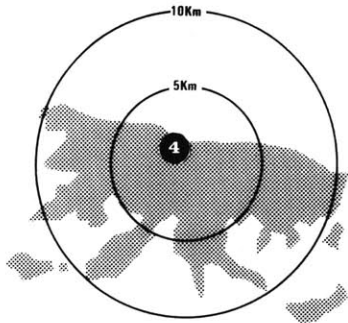
DWELLING UNIT PAYMENTS
 financing: Public
 rent/mortgage: \$ 98 / month
 income for rent/mortgage: 20 %

PHOTOGRAPHS:
 PEDRO CAMEJO: (top) An access street to the parking lot. (left) Pedestrian way between two buildings with gardens on both sides, (right) Dining-room in a single family dwelling.



4 SIMON RODRIGUEZ

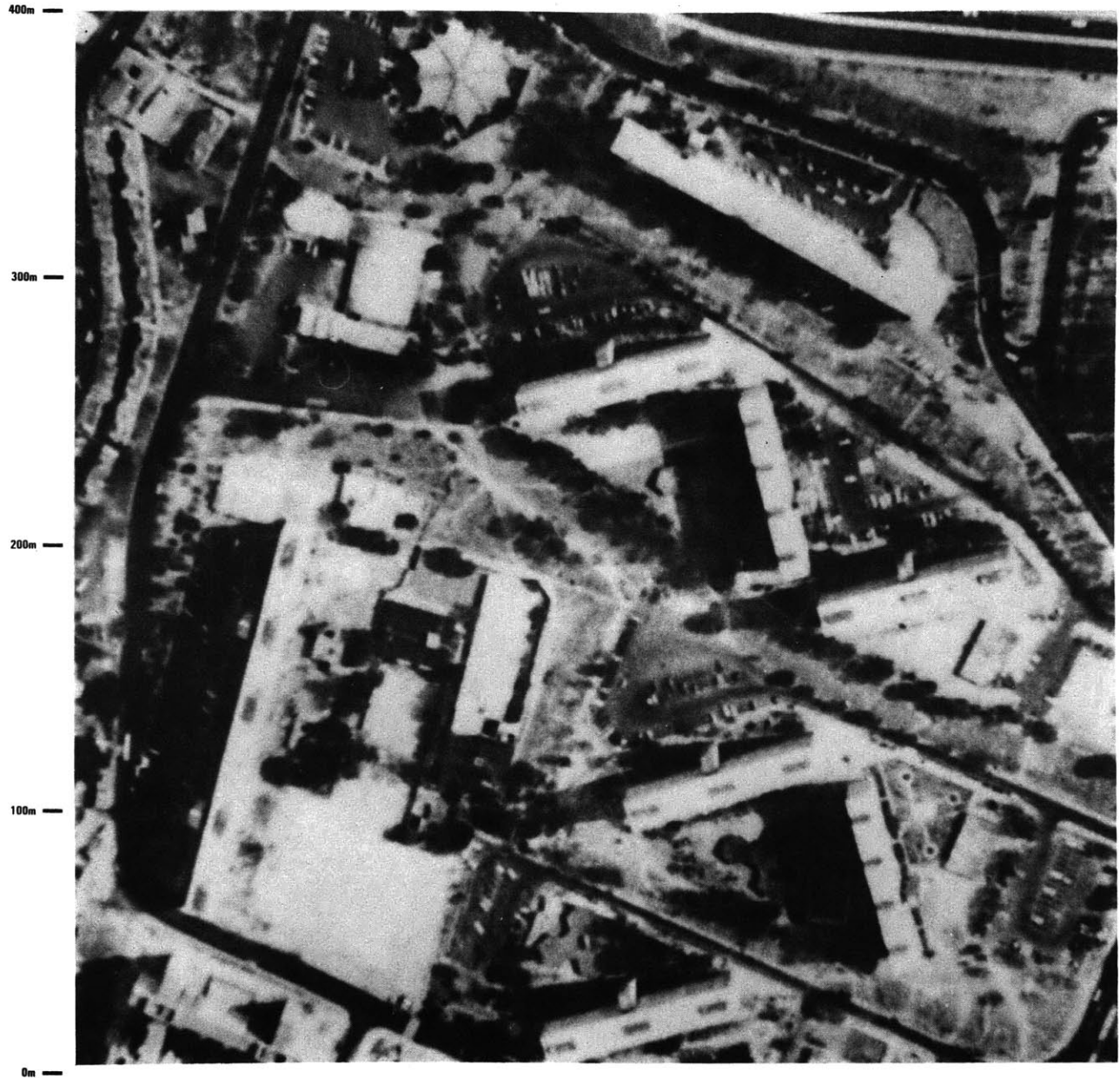
PUBLIC, HIGH-RISE APARTMENTS



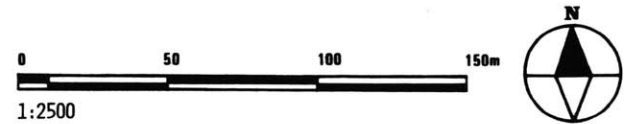
LOCATION: The Simon Rodriguez project is situated in the north-central area of Caracas Valley. It is located 1.5 kilometers from the center of the city, with an area of approximately 11.5 hectares. Trujillo Avenue provides a boundary for this project on the north and a slum called Pinto Salinas forms the boundary to the south. To the east a public housing development also called Pinto Salinas provides a boundary and to the west the boundary is formed by another public housing development called Pedro Camejo.

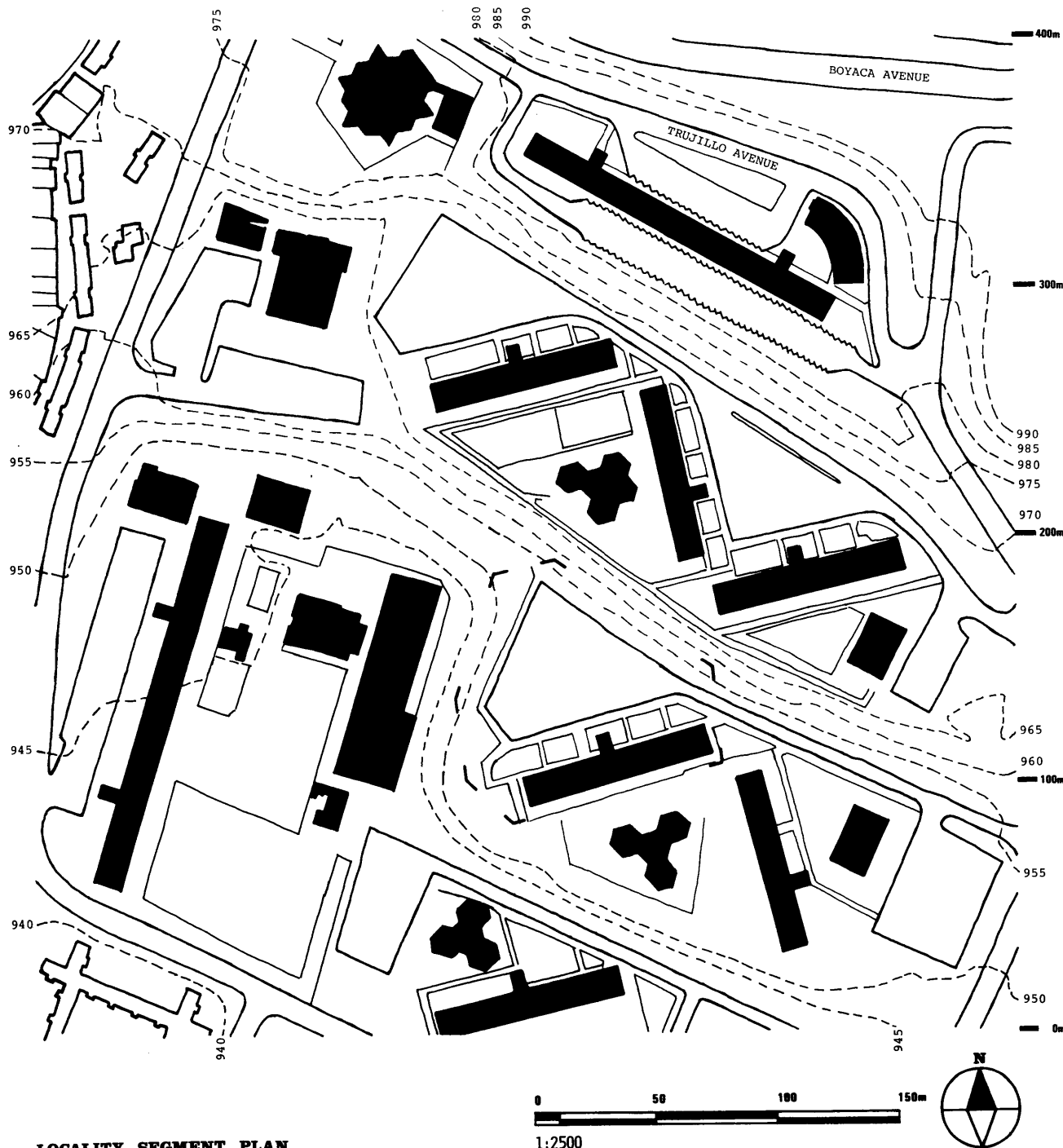
ORIGINS: Before 1955 the Simon Rodriguez area had been occupied by squatter shanties. Between the years 1955 and 1957, the shanty area grew considerably. This growth was due largely to the dislodgement of the population of the Pedro Camejo area causing the people to move to the border area of Simon Rodriguez. This population movement occurred when Pedro Camejo suffered an urban renewal.

LOCALITY SEGMENT: The selected segment clearly shows the vehicular arrangement and the residential areas that have been used. It is very easy from looking at this segment to appreciate the great difference between the private areas and public and semipublic ones. The great diversity in the location of the buildings shows clearly the lack of criteria in the situation of the buildings. This particular pattern of layout generated high costs in the conditioning of the land.



LOCALITY SEGMENT AIR PHOTOGRAPH

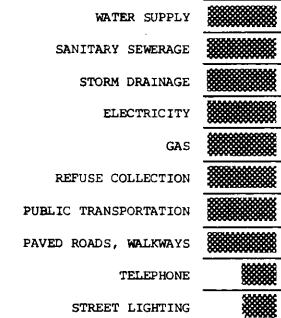




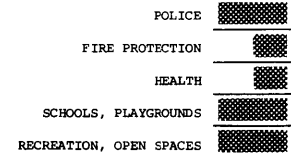
LOCALITY SEGMENT PLAN

1:2500

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

SELECTED BLOCK [] []

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	10	15.18	.65
DWELLING UNITS	855	15.18	56
PEOPLE	4456	15.18	293
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)		.65	4
SEMI-PUBLIC (open spaces, schools, community centers)		5.11	34
PRIVATE (dwellings, shops, factories, lots)		9.42	62
SEMI-PRIVATE (cluster courts)			
TOTAL		15.18	100

NETWORK EFFICIENCY

Network length (streets, walkways) = 107 mts/Ha
 Areas served (total area)

LAYOUT: The Simon Rodriguez layout corresponds with the typical design of the early 1960's which was utilized in Europe and the United States at that time. The layout consisted of dispersed buildings with no relation between the individual buildings. This dispersion of the buildings produced high costs in the infrastructure and maintenance.

Another important factor that must be taken into consideration is the lack of relationship between building and public areas. Finally this layout does not have a defined pattern and all the urban elements are set in an irregular and arbitrary way.

LAND USE: The layout's lack of consistency causes the majority of the land to be used as public and semipublic areas.

Field observations show that the majority of the semipublic areas become a dump area because the semipublic spaces lack any type of control and maintenance. Another factor that produces this situation is the height of the high rise buildings (15 floors). The families living in them lose the sense of ownership of the semipublic land. In other words, no one feels responsible for these spaces, so no one takes care of them.

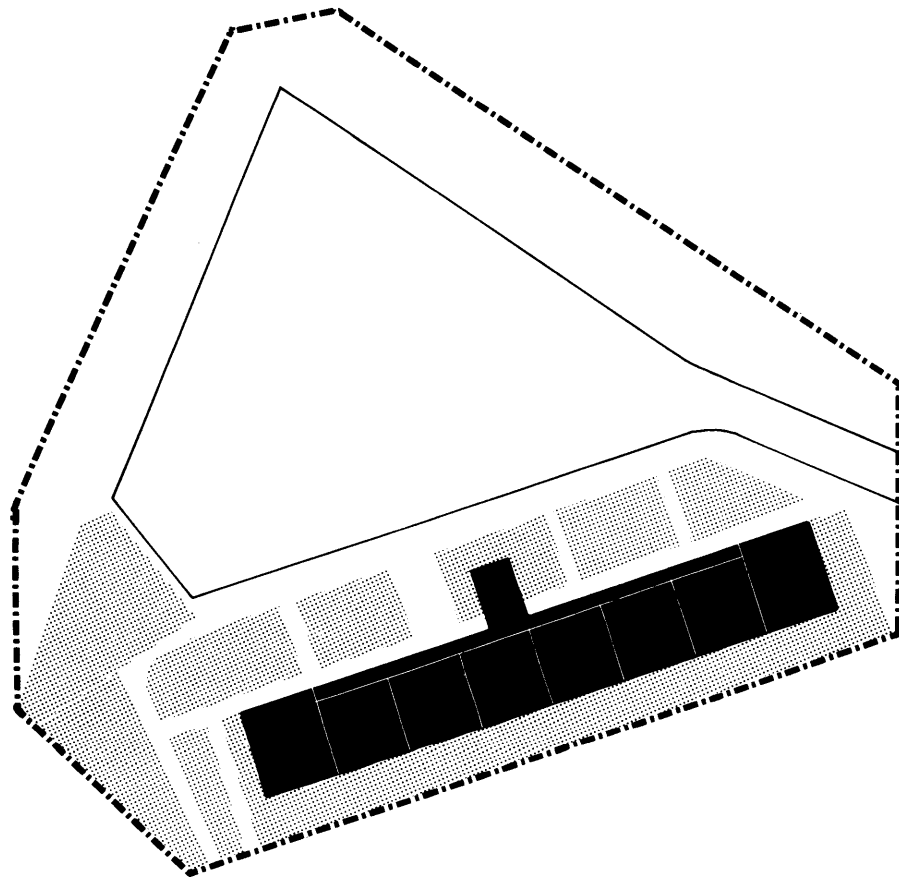
Commercial areas are scattered throughout the development and do not have a particular schematic relationship with the whole of the project. The same type of situation exists in relation to the schools and the semipublic areas.

CIRCULATION: There is a clear distinction between the circulation of the vehicles and pedestrian circulation. This distinction is due primarily to the characteristic of the layout. The vehicular circulation consists of a perimetral avenue that connects with minor streets and end in parking areas.

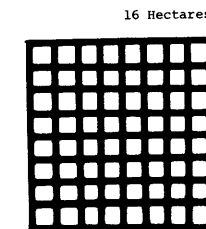
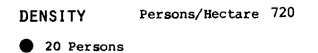
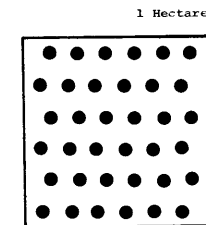
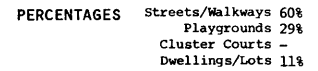
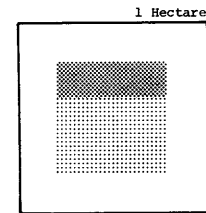
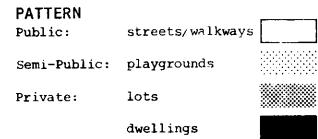
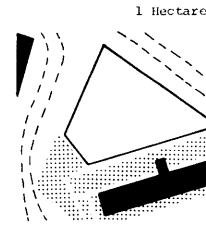
The width of the streets vary from 8 meters to 12 meters. Pedestrian circulation consists mainly of stairs which are due to the topographical characteristics of the area. Thus, the relationship between vehicular and pedestrian circulation is non-existent.

PHOTOGRAPHS,
SIMON RODRIGUEZ: (top) General view of the buildings taken from the Avila Mountain, (bottom) Typical street and bus station.





LAND UTILIZATION DIAGRAMS



LOCALITY BLOCK LAND UTILIZATION 1:1000

BLOCK: The select block is a typical block with an area of about 1 hectare. It demonstrates the typical land use situation that one building occupies less than ten percent of the area. This situation reflects the inadequate use of the land which has produced a high percentage of semipublic and public areas. Field observations show these areas are abandoned and have a lack of maintenance largely in the green areas. In addition, this kind of project generated a high increase of cost in infrastructure and initial development.

LOCALITY BLOCK LAND UTILIZATION DATA

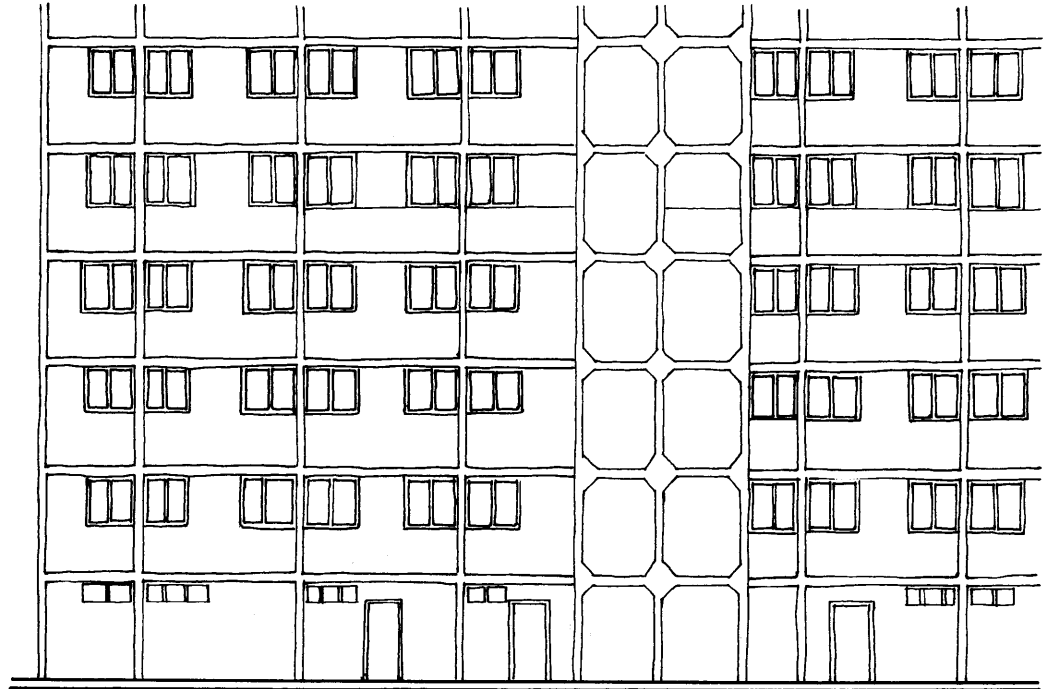
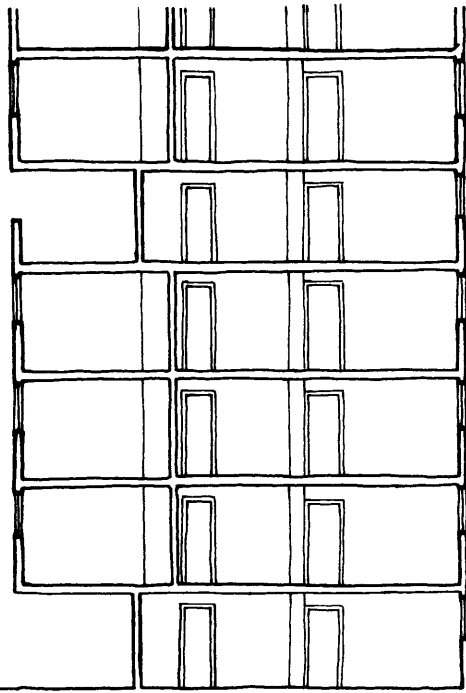
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	1	.87	1
DWELLING UNITS	120	.87	138
PEOPLE	626	.87	720

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	.52	60
SEMI-PUBLIC (open spaces, schools, community centers)	.25	29
PRIVATE (dwellings, shops, factories, lots)	.10	11
SEMI-PRIVATE (cluster courts)		
TOTAL	.87	100

NETWORK EFFICIENCY
 Network length (streets, walkways) = 410 mts/Ha
 Areas served (total area)

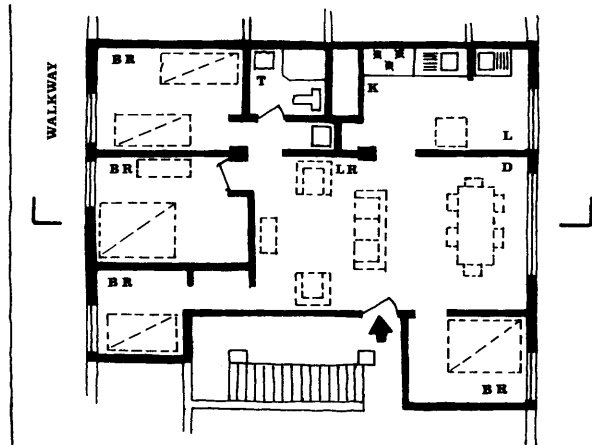
LOTS
 Average area, dimensions = 2500 , 25 x 100

Circulation efficiency 410 m/Ha



SECTION

ELEVATION



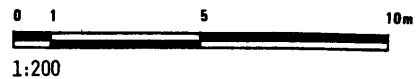
PLAN

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry

CASE STUDY SOURCES

Plan: (approximate) PLAN CARACAS, CARTOGRAFIA. Air photographs and plans, 1976.
 Field survey 1977-1978
 Segment Plan: (approximate) PLAN CARACAS
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 Photographs: The author 1977- 1978-1979.
 Other Information: Field survey 1977-1978.
 B.O. Banco Obrero reports
 I.N.A.V.I. Instituto Nacional de Vivienda reports 1977.
 Gobernacion de Caracas.



TYPICAL DWELLING

PHYSICAL DATA

(related to dwelling and land)

DWELLING UNIT

type: Apartment
 area (sq m): 82
 tenure: Legal Rental

LAND/LOT

utilization: Semi-private
 area (sq m): 1.230
 tenure: -

DWELLING

location: Inner Ring
 type: High Rise
 number of floors: 15
 utilization: Single Family
 physical state: Good

DWELLING DEVELOPMENT

mode: Instant
 developer: Public
 builder: Large Contractor
 construction type: Masonry / Concrete
 year of construction: 1958

MATERIALS

foundation: Reinforce Concrete
 floors: Cement
 walls: Masonry
 roof: Reinforce Concrete

DWELLING FACILITIES

wc: 1
 shower: 1
 kitchen: 1
 rooms: 4
 other: -

SOCIO-ECONOMIC DATA

(related to user)

GENERAL: SOCIAL

user's ethnic origin: South Venezuelan
 place of birth: Bolivar
 education level: Secondary

NUMBER OF USERS

married: 2
 single: 1
 children: 2
 total: 5

MIGRATION PATTERN

number of moves: 2
 rural - urban: 1945
 urban - urban: 1959
 urban - rural:
 why came to urban area: Employment

GENERAL: ECONOMIC

user's income group: Moderate
 employment: Mechanic
 distance to work: 1 Km
 mode of travel: Walks

COSTS

dwelling unit: \$ 9.981
 land - market value: N.A

DWELLING UNIT PAYMENTS

financing: Public
 rent/mortgage: \$ 108
 income for rent/mortgage: 21 %

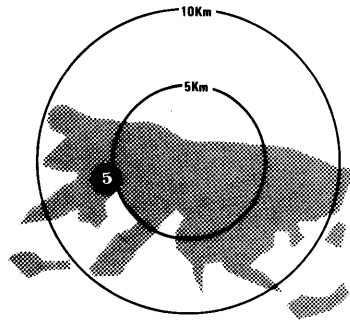
PHOTOGRAPHS:

SIMON RODRIGUEZ: (top) Private parking lot in front of one building, (left) Dining-room in a single family apartment, (right) Living-room.



5 MORAN

POPULAR, SHANTIES



LOCATION: The squatter development of Moran, or "Barrio Moran", is located on the west-central side of the Caracas Valley. It covers an area of approximately 43 hectares and is located a distance of approximately 2 kilometers from the center of the city.

ORIGINS: As a consequence of the economic changes occurring within Venezuela, many migrants from other parts of the country came to Caracas.

The majority of the migrants settled in the tenements on the north-west side of the city in an area called Catia, which is located very close to Moran. But the excess of migrant population not absorbed in this tenement area became established in the area of Moran as squatters. This originally took the form of a few shanties on one side of Simon Bolivar Avenue and around a small industrial area called "La Silsa". But due to the lack of interest and control by the authorities, this squatter area grew very rapidly. In 1957 more than 6,400 persons lived in this area, but now more than 15,000 persons live in Moran.

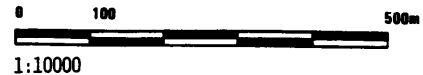
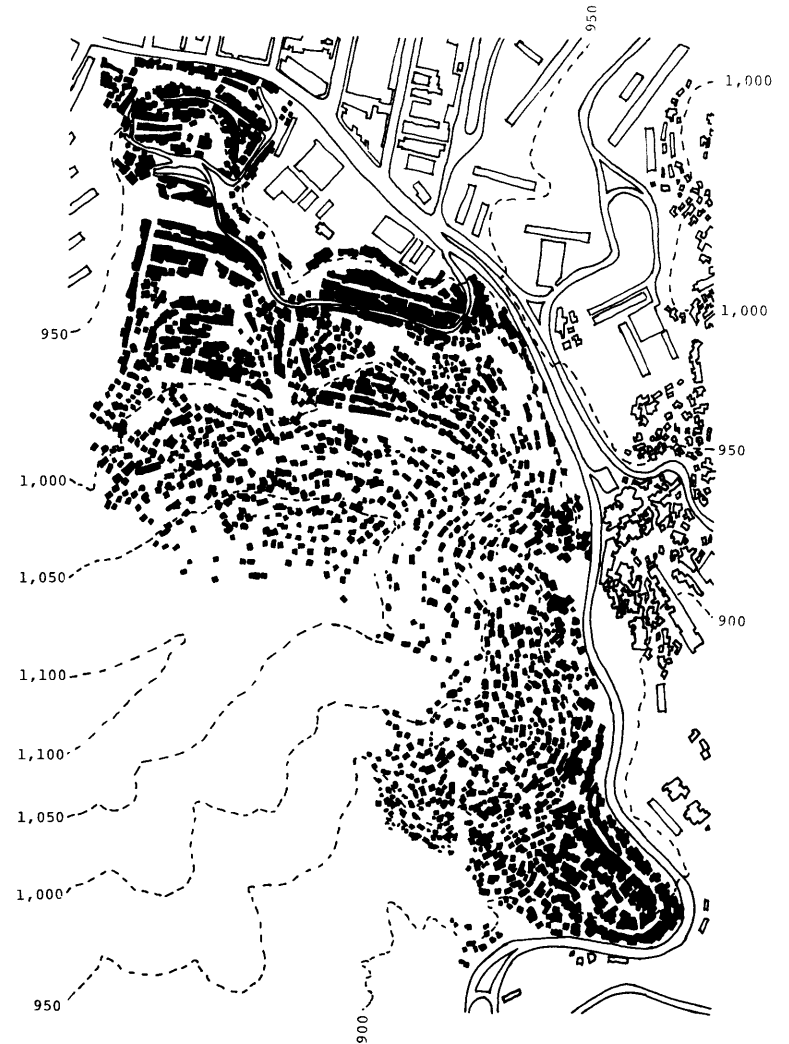
LAYOUT: Moran's layout is determined by the topographical conditions of the site and can be divided into two parts.

One part is Lower Moran which is very close to Simon Bolivar Avenue and is flat enough to allow access to the streets which serve the lots proximal to them. In general, the value of this land is higher in relation to the other areas in the development. Field observations show that the majority of the dwellings in this area are completely consolidated in terms of the replacement of mud walls with better building materials.

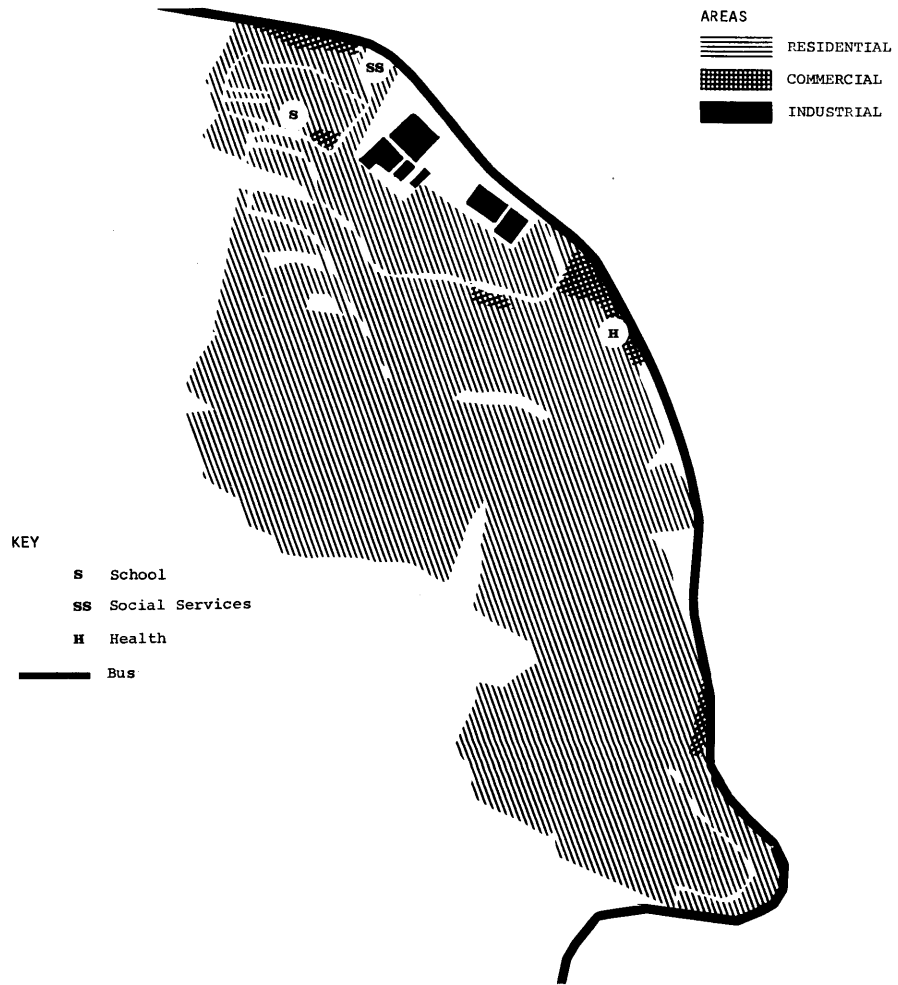
Upper Moran is the second part and is separated from the lower area by Principal Street. In this area the majority of the dwellings follow the contour lines and terrain which contains slopes of more than 40%. Pedestrian access to these dwellings is largely through a network of stairways climbing these slopes. The streams throughout this area are used for garbage and sewage disposal.

LAND USE: Moran is primarily a residential development, surrounded by older middle class developments, public housing developments and small industrial areas. Most of the community facilities are located outside of the area. Commercial activities are primarily located along the Simon Bolivar Avenue in front of the lower area of Moran. But it is possible to find several small commercial and service shop dwellings scattered throughout the streets of the development. Moran has one of the highest densities for a squatter development in this area of the city.

CIRCULATION: The main vehicular access to Moran is through a minor road, "Independencia Street". This road serves many small lots on the lower area of Moran and is connected with other small roads which run in a north-south direction. Public transportation is available in this area primarily through the use of a Jeep. The other circulation is pedestrian that connects with the highest point in the development.



LOCALITY PLAN



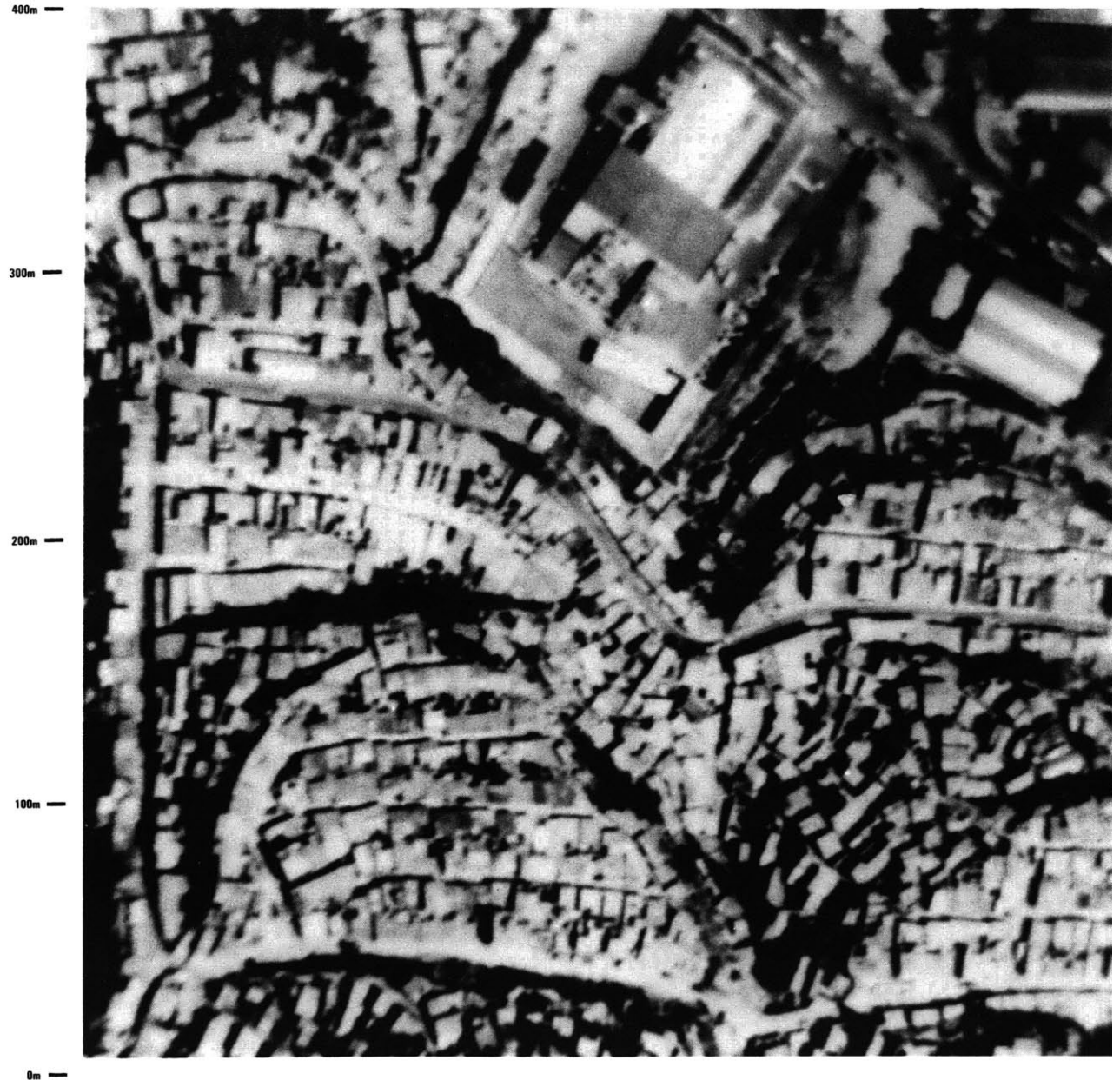
LOCALITY LAND USE PATTERN



LOCALITY CIRCULATION PATTERN



LOCALITY SEGMENT: The selected segment shows how the people organized and constructed their dwellings by themselves. The need for land is reflected in the area of lots which is generally the same. It is important to notice that the layout in this section was done without technical assistance and it is interesting to see that the people built their houses in an agreeable relationship with the topographical conditions. The same consideration is applicable to pedestrian and vehicular circulation. Finally, the segment shows that no land exists for semi-public use which is a typical situation in this kind of development.

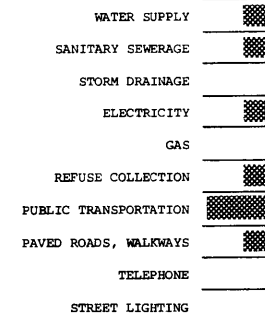


LOCALITY SEGMENT AIR PHOTOGRAPH

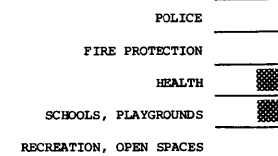




LOCALITY UTILITIES AND SERVICES



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

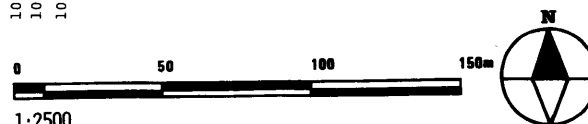
SELECTED BLOCK []

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	858	13.30	64
DWELLING UNITS	858	13.30	64
PEOPLE	5148	13.30	307
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)		.94	7
SEMI-PUBLIC (open spaces, schools, community centers)		.96	7
PRIVATE (dwellings, shops, factories, lots)		12.26	86
SEMI-PRIVATE (cluster courts)			
TOTAL		13.30	100

NETWORK EFFICIENCY

Network length (streets, walkways) = 131 mts/Ha
 Areas served (total area)



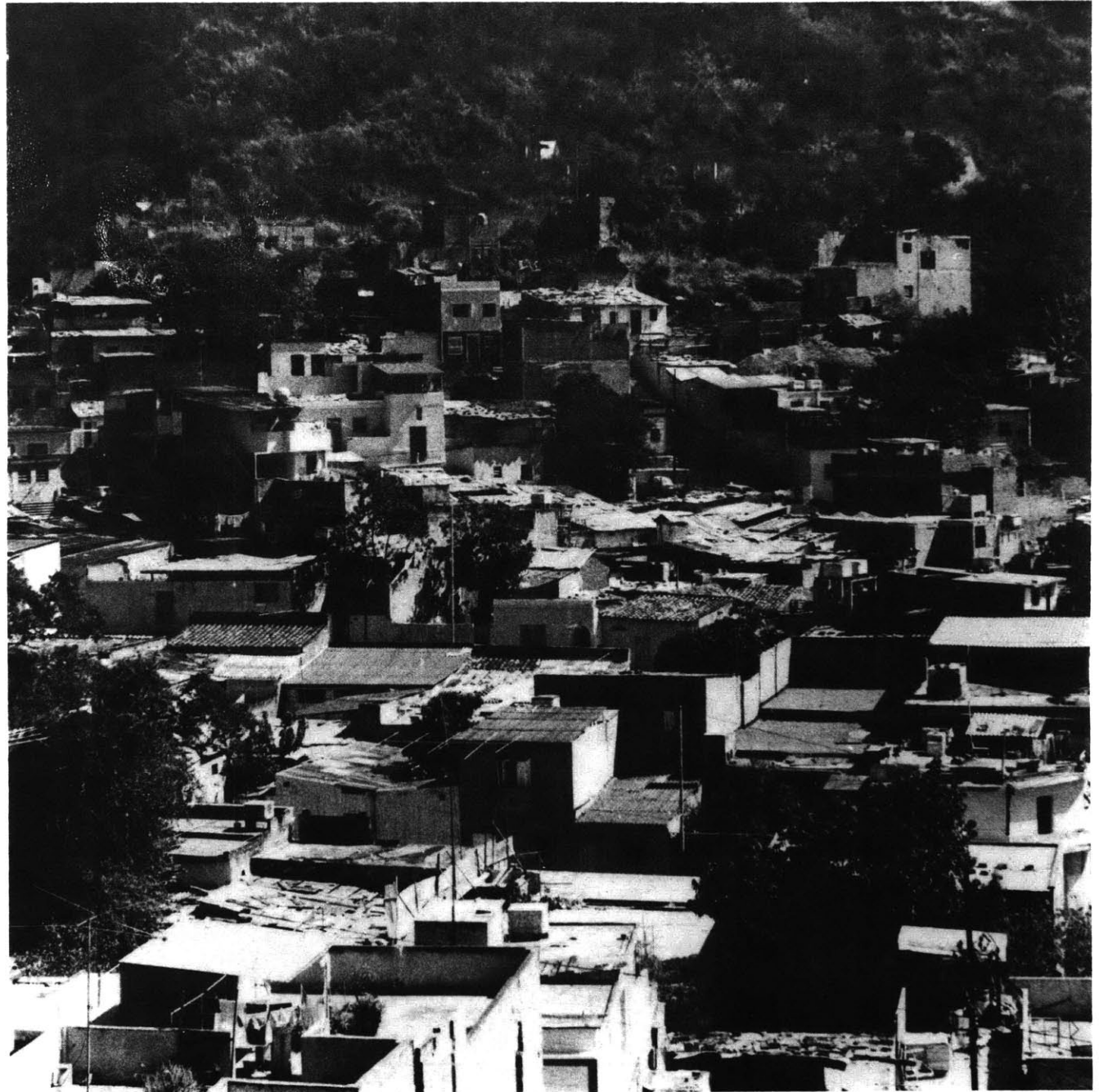
LOCALITY SEGMENT PLAN

1:2500

POPULATION-INCOME: The majority of the people in Moran are of the very low and low income levels with a few exceptions of moderate income level. Most of the people came from rural areas with a large percentage originating from the central area of the country. Primarily, many foreign people in this area are immigrants from Colombia. In relation to educational level, the majority are illiterate with a few exceptions who have reached the primary level.

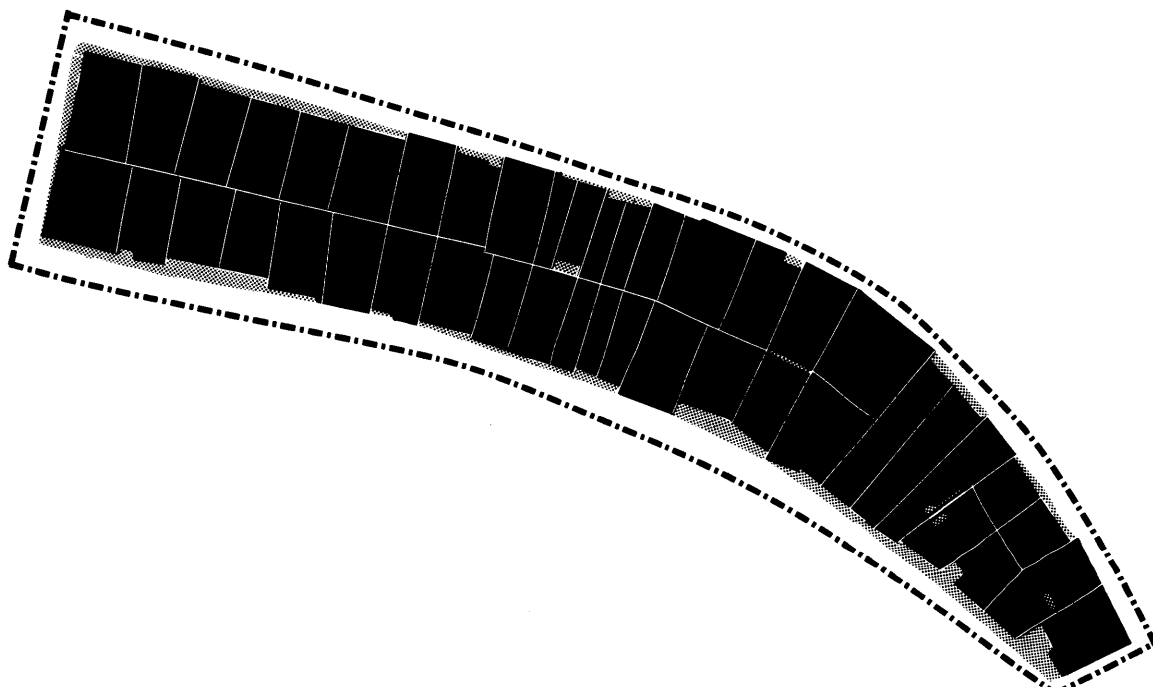
BLOCK: In general, the shape of the blocks in Moran is consistent with the topography of the site and with the spontaneity of growth in this area. The selected block is served by two small roads, one on the north side and the other to the south. In general, the streets that border the block are pedestrian, however it is possible to use these streets for vehicular traffic.




The block is made of many row houses which are used for individual dwellings and in some cases for tenements. The majority of these houses are owner occupied.

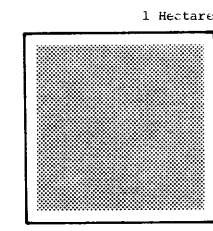


PHOTOGRAPHS,
MORAN: View from the street in direction of the development.

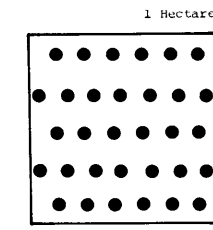
LAND UTILIZATION DIAGRAMS



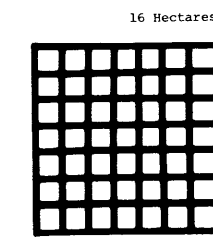
PATTERN
 Public: streets, walkways 
 Private: lots 
 dwellings 



PERCENTAGES
 Streets/Walkways 23%
 Playgrounds -
 Cluster Courts -
 Dwellings/Lots 77%



DENSITY
 Persons/Hectare 640
 ● 20 Persons



Circulation efficiency 360 m/Ha

LOCALITY BLOCK LAND UTILIZATION DATA

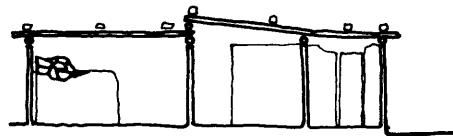
	Total Number	Area Hectares	Density N/Ha
DENSITIES			
LOTS	44	.48	92
DWELLING UNITS	44	.48	92
PEOPLE	307	.48	640

	Hectares	Percentages
AREAS		
PUBLIC (streets, walkways, open spaces)	.11	23
SEMI-PUBLIC (open spaces, schools, community centers)		
PRIVATE (dwellings, shops, factories, lots)	.37	77
SEMI-PRIVATE (cluster courts)		
TOTAL	.48	100

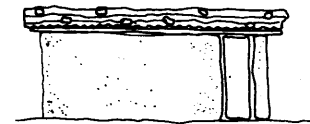
NETWORK EFFICIENCY
 Network length (streets, walkways) = 360 mts/Ha
 Areas served (total area)

LOTS
 Average area, dimensions = 77 , 11 x 7 m

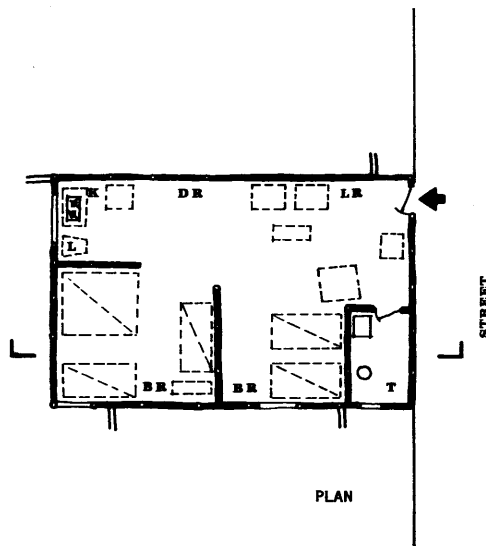




SECTION



ELEVATION



PLAN

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry

CASE STUDY SOURCES

Plan: (approximate) PLAN CARACAS, CARTOGRAFIA. Air photographs and plans, 1976.
 Field survey 1977-1978.
 Land Use Pattern: (approximate) B.O. I.N.A.V.I.
 Circulation Pattern: (approximate) B.O. I.N.A.V.I.
 Segment Plan: (approximate) PLAN CARACAS
 Block Plan: (accurate) PLAN CARACAS, CATASTRO.
 Typical Dwelling: (approximate) Field survey 1977-1978.
 Physical Data: (approximate) Field survey 1977-1978.
 Photographs: The author 1977-1978-1979.
 Other Information: Field survey 1977-1978.
 B.O. Banco Obrero reports
 I.N.A.V.I. Instituto Nacional de Vivienda, reports 1977.
 Gobernacion de Caracas.



1:200

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
 type: Shanty
 area (sq m): 48
 tenure: Extralegal Ownership

LAND/LOT
 utilization: Private
 area (sq m): 50
 tenure: Extralegal Ownership

DWELLING
 location: Inner Ring
 type: Semi-detached Shanty
 number of floors: 1
 utilization: Single Family
 physical state: Fair

DWELLING DEVELOPMENT
 mode: Incremental
 developer: Popular
 builder: Artisan
 construction type: Mud-Wattle
 year of construction: 1972

MATERIALS
 foundation: N.A
 floors: Dirt
 walls: Mud-Wattle
 roof: Corrugated Cardboard
 Zinc

DWELLING FACILITIES
 wc: 1
 shower: -
 kitchen: 1
 rooms: 2
 other: -



SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
 user's ethnic origin: West Venezuelan
 place of birth: Merida
 education level: None

NUMBER OF USERS
 married: 1
 single: 1
 children: 2
 total: 4

MIGRATION PATTERN
 number of moves: 3
 rural - urban: 1961
 urban - urban: 1970
 urban - rural: -
 why came to urban area: Employment

GENERAL: ECONOMIC
 user's income group: Very Low
 employment: -
 distance to work: -
 mode of travel: Walks

COSTS
 dwelling unit: \$ 760
 land - market value: -

DWELLING UNIT PAYMENTS
 financing: Popular
 rent/mortgage: \$ 7 / Month
 income for rent/mortgage: 10 %



PHOTOGRAPHS:
 MORAN: (top) Main street which is a border of the development, (left) Pedestrian circulation inside of the development. (right) A typical house, notice relation with the topographical conditions.



EVALUATIONS

Eight case studies have been considered for the evaluation that represent the basic dwelling types for low income groups.

These urban/dwelling environments are compared and analyzed in relation to their land utilization, block, network efficiency, densities, etc. Also a comparative view of the dwellings has been made, and finally, an analysis in relation to the public housing situation in terms of demand, population, deficiency, etc. Has been taken into consideration with the idea of giving an overview of low income housing in Caracas.

The following sections are included in the evaluations:

LAND UTILIZATION SUMMARY. This is a comparative graph for analysis of the land use.

TIME PROCESS PERSPECTIVE. This is a graph which correlates the dwellings, origins, evolutions, locations, etc. To time.

PUBLIC HOUSING MATRIX. This is a comprehensive matrix of the public housing situation with comments.

SUMMARY: Land Utilization

LOCALITY SEGMENT 100 MTS X 100 MTS. 1 HECTARE
LOCALITY: Eight different localities were selected in order to show a general overview of urban/dwelling environments. Four of these localities are public housing. For comparison reasons a typical segment of 100 mts by 100 mts is taken from each locality. Each segment shows the land subdivision and circulation layout.

LOCALITY BLOCK LAND UTILIZATION DATA
LOCALITY BLOCK: One typical block was taken from each locality segment. This block is selected with the idea of showing more clearly land utilization, circulation length and densities in relation to lots, dwelling and people.

LAND UTILIZATION DIAGRAMS 1 HECTARE
LAND UTILIZATION PERCENTAGES: These diagrams show the comparison of different proportions of public, semipublic, semiprivate and private land. The purpose of this comparison is to determine users control, maintenance etc, which are in direct relation to the layout efficiency. High percentage in public land represents high cost of infrastructure length, circulation, and maintenance which become direct or indirect cost to the developers and city administration.

NET DENSITY 1 HECTARE
20 PERSONS
DENSITIES: The number of persons per hectare which is in direct relation to the number of lots and characteristics of the dwellings per hectare represents the intensity of land use. Low densities mean higher development costs per person.

NETWORK EFFICIENCY 400 X 400 MTS. 16 HECTARES
CIRCULATION LENGTHS: The relationship between public circulation length and area served represents network efficiency. This means that high ratios of circulation involve less efficiency of the network through an increase in the direct and maintenance costs.

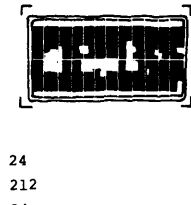
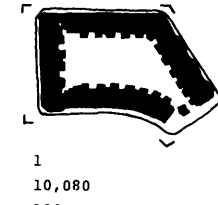
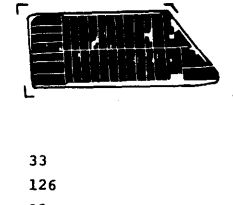
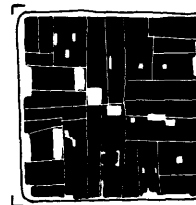
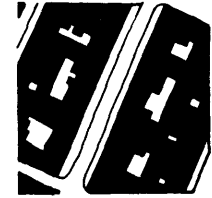
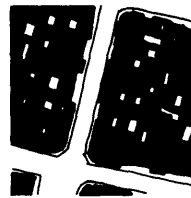
LOCALITIES
DATE
HOUSE TYPES
INCOME

1 CENTRO
Up to 1900
Old traditional Tenement
Middle, Very low

2 SARRIA
1930-40
Old speculative, Tenement
Mod, low, very low

3 EL SILENCIO
1941
Public housing, walk up
Moderate low, middle

4 PROPATRIA
1946
Public housing, row hou
Moderate low, middle



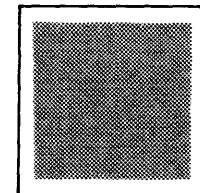
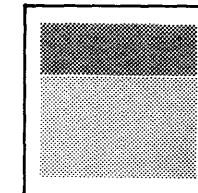
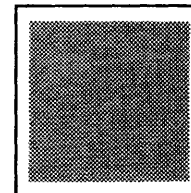
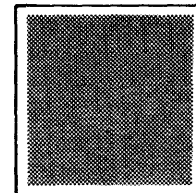
NUMBER OF LOTS
AVERAGE LOT AREA
DWELLING UNITS

27
240
27

33
126
33

1
10,080
100

24
212
24



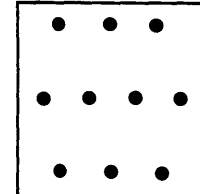
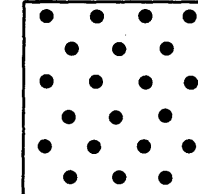
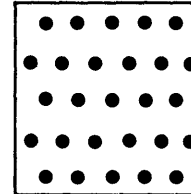
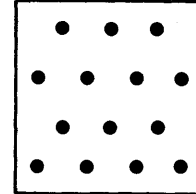
% OF PRIVATE LAND
% OF SEMIPRIVATE LAND
% OF SEMIPUBLIC LAND
% OF PUBLIC LAND

82%
-
-
18%

73%
-
-
27%

25%
50%
-
25%

70%
-
-
30%



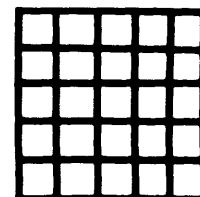
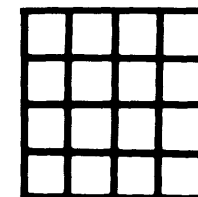
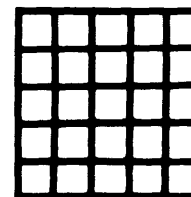
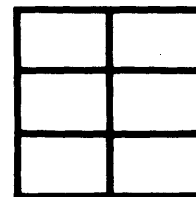
PERSONS/Ha

280

544

421

203



Mts/Ha

120

240

201

246

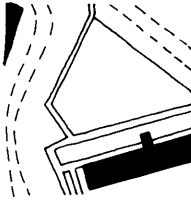
5 PEDRO CAMEJO

1956
Public housing, walk up
Moderate low, middle



6 SIMON RODRIGUEZ

1958
Public housing, walk up
Moderate low, middle



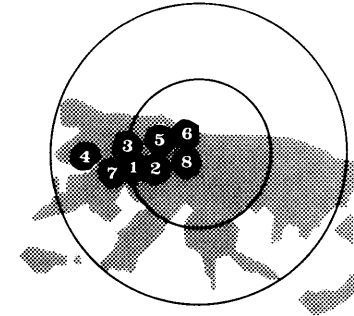
7 MORAN

1950-1975
Squatters
Very low, low

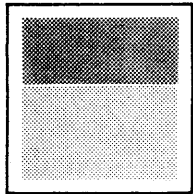


8 PINTO SALINAS

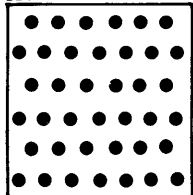
1960-1973
New illegal subdivision
very low, low



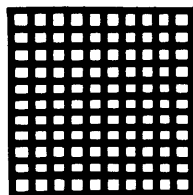
1
1,900
32



30%
-
48%
22%

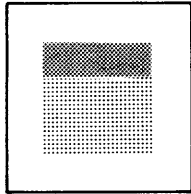


780

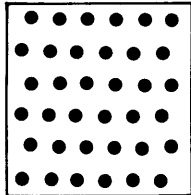


510

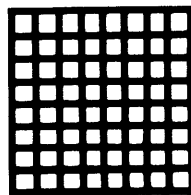
1
2,500
120



11%
-
29%
60%

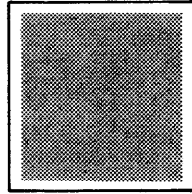


720

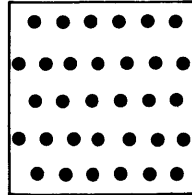


410

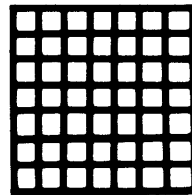
44
77
44



77%
-
-
23%

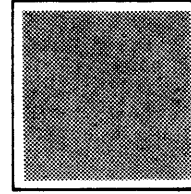


640

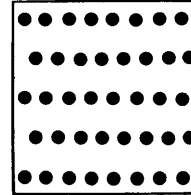


360

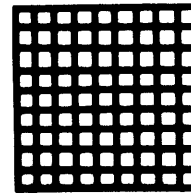
22
42
22



84%
-
-
16%



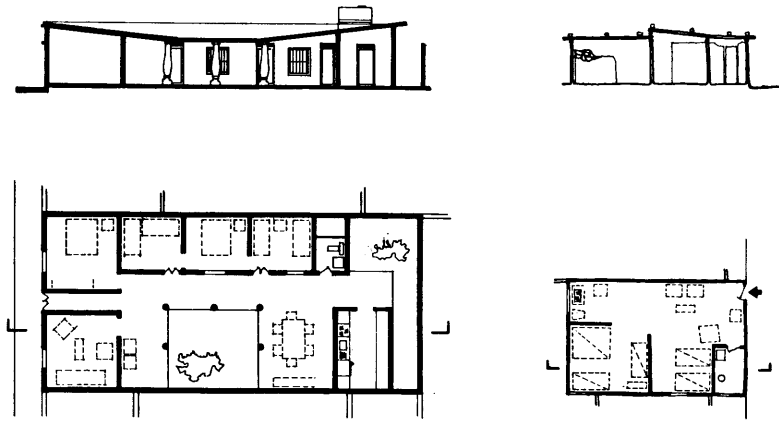
800



460

- 1 CENTRO
- 2 SARRIA
- 3 EL SILENCIO
- 4 PROPATRIA
- 5 PEDRO CAMEJO
- 6 SIMON RODRIGUEZ
- 7 MORAN
- 8 PINTO SALINAS

TIME/PROCESS PERSPECTIVE

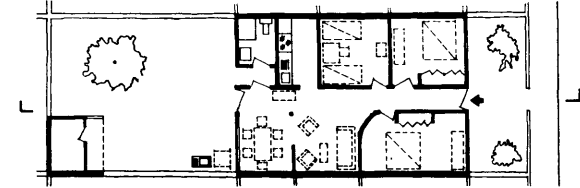
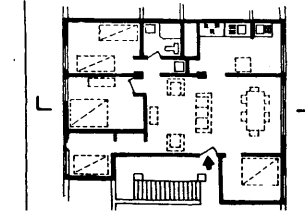
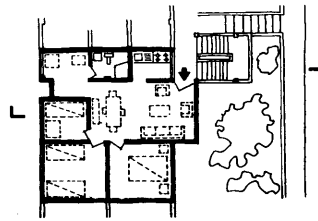
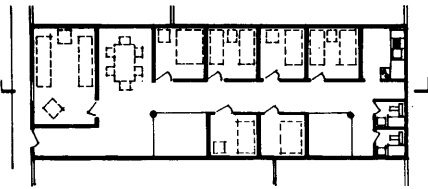
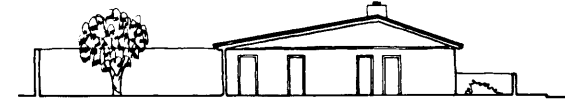
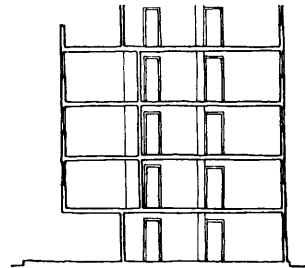
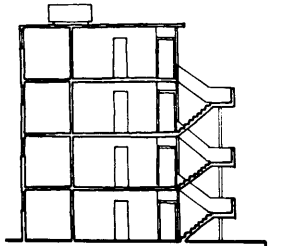


The case studies cover the range of income levels from very low to middle. They represent past, present and future trends of evolution and development.

Dwelling types are arranged horizontally according to income levels; they relate vertically to its past origins, present conditions and future trends of expected development. The chart provides information about users, densities, evolution trends and their changes over time.

Old traditional dwelling types are slowly disappearing due to increasing commercial pressure in the city center. Public row houses are relatively static. Tenements are increasing in peripheral areas. Shanties are stabilized due to government housing policies. High rise apartments are being highly promoted by the government therefore increasing fastly. Walk-up apartments are slowly increasing mainly due to diverse pressures from the construction sector which discourages this type of apartments.

	TYPE	TRADITIONAL HOUSE	SHANTY
	LOCATION	CENTER AREA, INNER RING	INNER RING AND PERIPHERY
	LAYOUT	COLONIAL BLOCK. In 16th century, spanish cities on gridiron layout.	ACCRETION. Growing organically, grouped in irregular forms.
PAST	ORIGIN	HIBRID. Between spanish native houses. Appeared in 16th century.	UNIVERSAL. Appeared with the growth of urban areas.
	USERS	MIDDLE/HIGH. Businessmen, land owners.	VERY LOW. Housing solution for the lowest income groups.
	DENSITY	LOW/MEDIUM. Single family, big lots, low and medium densities.	MIDDLE/HIGH. Land with hills and gorges was easily available.
	CONFIGURATION	SMALL HOUSES. 2-3 bedrooms, yard, court. All utilities.	ROOMS. 1-2. Temporary construction, scrap materials in general. No services and utilities.
PRESENT	DEVELOPMENT	PRIVATE/INSTANT/INCREMENTAL. In general, developed by private groups or persons.	POPULAR/INSTANT. Built by artisans or self-help, Dwelling developed incrementally when land tenure is secured.
	USERS	MODERATE/MIDDLE. Public workers and persons who work near or in the city center.	VERY LOW. Due to the land cost and lack of control. Located in preripheral hills, sometimes in the inner ring.
	DENSITY	LOW/MEDIUM. Continued low densities in relation to the location of these houses.	MEDIUM/HIGH. Lack of land for development. Increase densities.
	TREND	DECREASING. Due to the characteristics, location, land costs, etc.	PROLIFERATING. Due to the saturation in the inner ring proliferating in the hills.
	LOCALITIES	LA PASTORA, SAN JOSE, ALTAGRACIA	MORAN
FUTURE	USERS	MODERATE/MIDDLE. The users, in all probability will move due to its proximity to the center of the city.	VERY LOW/LOW. When income levels increase, consolidation of the actual settlements occurs.
	DENSITY	MEDIUM. Densities increase with subdivision of the lots.	HIGH/MEDIUM. Densities increasing due to lack of land.
	TREND	DISAPPEARING. Due to the new system of land subdivison and cost of the land.	STABILIZATION. Consolidation of existing settlements.



LOW INCOME TENEMENT
CITY CENTER, INNER RING.
COLONIAL BLOCK, OTHER LAYOUTS.

WALK UP APARTMENT
CITY CENTER, INNER RING AND PERIPHERY
Different patterns of layout according
to location.

HIGH RISE APARTMENTS
INNER RING AND PERIPHERY
Different layout patterns according to
location and topographical conditions.

PUBLIC ROW HOUSE
INNER RING
Gridiron. Typical standard Gridiron layout.

SUBDIVISION SPANISH HOUSE. 17th century changed inside for new use.

EUROPEAN, US. First used in Caracas around 1940.

EUROPEAN, US. 19th century model originally used for middle income groups.

EUROPEAN. First used in Caracas in 1942.

VERY LOW. First stage of migrants in the urban areas. Lowest income groups.

MODERATE/MIDDLE. Mainly public workers and merchants.

MODERATE/MIDDLE. This housing type is not applicable to low and very low levels

MODERATE/MIDDLE INCOME. Projected for low income, but used for middle levels.

MEDIUM/HIGH. Allowed numerous persons in one house.

MEDIUM/HIGH. 4 floors with small areas for garden and parking. High densities.

In general higher densities with non economical use of the land.

Low/Medium. Single family units in big size lots.

ROOMS. 2-4 rooms around a central court. 1-3 floors.

APARTMENTS. 2-3 bedrooms. Buildings with 3-4 stories sharing stairs.

APARTMENTS. 2-3 bedrooms, 8-10 apartments per floor. Buildings with 10 or more stories with 1-2 elevators.

HOUSES 2 - 3 rooms, 1 floor but sometimes residents built a second floor in accordance with family need. All utilities.

PRIVATE/INSTANT. Developed by private owner who increases the number of rooms for rent.

PUBLIC/INSTANT. Publicly developed, in some cases both public and private. Built by large contractors.

PUBLIC/INSTANT. Buildings with all utilities. Large contractors.

PUBLIC/INSTANT. Developed by government, large contractors.

VERY LOW/LOW. Lowest income groups. Bad services in relation to number of families.

MODERATE/MIDDLE. Originally built for lowest income. Due to its cost, only applicable to moderate and middle income.

MODERATE/MIDDLE. The income level is the same due to inefficient design patterns that increase housing costs.

MODERATE/MIDDLE. This kind of government project does not apply for lowest income groups.

MEDIUM/HIGH. Due to their characteristics: small rooms, Many people.

MEDIUM/HIGH. Large buildings, smaller apartments permitting higher densities.

MEDIUM/HIGH. The densities are high but without good land utilization.

LOW/MEDIUM. Due to the characteristics of the development patterns, the density almost cannot increase.

INCREASING. Basically in the inner ring because city center is saturated. SARRIA

INCREASING. Slow increase, mainly in the peripheral areas.

INCREASING. Due to lack of land.

STABILITY. Due to increase in cost and decrease in availability of land.

EL SILENCIO, PEDRO CAMEJO.

SIMON RODRIGUEZ

PROPATRIA

VERY LOW/LOW. Continues to be the lowest housing solution for the lowest income levels.

MODERATE/MIDDLE. This solution will continue for the same groups.

MIDDLE/MIDDLE-HIGH. Due to the economic conditions of the population and inflation rates.

MIDDLE. Due to its cost and maintenance.

MEDIUM HIGH/HIGH. Density trend to remain at present levels.

HIGH/MEDIUM. Densities will tend to increase as land values soar up.

HIGH. Small apartments and many story buildings increase densities.

LOW/MEDIUM. The characteristics do not allow increasing density.

INCREASING. Will continue to increase mainly in the peripheral areas.

PROLIFERATING. Basically in the inner ring.

INCREASING. Promoted by the government and increasing middle class demand.

DECREASE. Due to increase in cost and decrease in availability of land.

INCOME GROUPS BENEFITED BY PUBLIC HOUSING POLICIES

NUMBER OF DWELLING UNITS					COST PER UNIT Total investment/number of units	INCOME \$ PER MONTH PER FAMILY	% OF INCOME GROUPS	DWELLING AFFORDABILITY	
YEARS	DEMAND	SUPPLY	DEFICIT	NO				YES	
1928 - 1938	13,000	2,315 18 %	10,685	\$ 1,871	VERY LOW \$ 0 - \$ 9 LOW \$ 10 - \$ 15 MODERATE \$ 16 - \$ 30 MEDIUM \$ 31 - \$ 89 HIGH over \$ 90				
1939 - 1948	30,000	4,893 16 %	25,107	\$ 2,340	VERY LOW \$ 0 - \$ 15 LOW \$ 16 - \$ 25 MODERATE \$ 26 - \$ 50 MEDIUM \$ 51 - \$ 148 HIGH over \$ 149				
1949 - 1958	73,610	21,016 28 %	52,594	\$ 4,815	VERY LOW \$ 0 - \$ 25 LOW \$ 26 - \$ 41 MODERATE \$ 42 - \$ 83 MEDIUM \$ 84 - \$ 247 HIGH over \$ 248				
1959 - 1968	91,413	24,575 26 %	66,842	\$ 5,755	VERY LOW \$ 0 - \$ 41 LOW \$ 42 - \$ 69 MODERATE \$ 70 - \$ 138 MEDIUM \$ 139 - \$ 413 HIGH over - \$ 414	29 %			
1969 - 1978	141,718	49,956 31 %	94,762	\$ 6,715	VERY LOW \$ 0 - \$ 69 LOW \$ 70 - \$ 115 MODERATE \$ 116 - \$ 230 MEDIUM \$ 231 - \$ 689 HIGH over - \$ 670	34 %	37 %		
						44 %	37 %		
						19 %			

The housing situation in Caracas and in the majority of the major cities presents a group of similar characteristics which in Caracas' case is aggravated by the rapid urban growth associated with this capital city of the country.

If the existing housing is analyzed, there is found an increasing trend in response to the demand of population growth so that today there is almost 11 times more housing than in 1938.

Due to the growth demand, the government also has increased the public housing supply by almost 11 times but this increase has failed to have a real relation to the growth demand.

In effect, this has produced a deficit that continues to grow. This deficit presents several aspects that must be considered. First, there is no relation between demand and supply. Second, the growth demand takes two forms, one being the natural growth of the population and the other being the migrant population that continues to arrive in the city. Third, and perhaps the most important, there exists no relation between income level of the population who apply for public housing and the cost of public housing.

This situation is reflected in many different ways. One example is the continuing increase of shanties or illegal developments around the city. Due to the imbalanced situation of cost versus income, the public housing solution primarily covers other income levels such as moderate low and middle.

Another factor that must be taken into consideration is the increase in the cost of living which actually works in opposition to the lowest income groups of the population.

In the opposite matrix, it is possible to appreciate that the income levels of the population have increased almost 7 times but the cost of public housing has increased by almost the same figure. It is important to notice that as in 1938, the cost of the houses today has no relation with the affordability of the lowest group to pay for the housing.

This imbalance has created tremendous problems in redemption of the government investment and has not facilitated the effective participation of private financing within the public developments.

Finally, it is important to notice that the lowest income group constituted in 1968 about 63 percent of the population and this group has increased to almost 81 percent in 1978. In addition to the other problems, the lowest income group is increasing at a greater rate than the other economic groups.

Sources: Banco Obrero Report, 1971
Housing in Latin America
Interamerican Bank Report, 1976
Politica de Vivienda, Banco Obrero, 1975



AERIAL PHOTOGRAPH

AERIAL PHOTOGRAPH
NORTH-WESTERN METROPOLITAN AREA.



1:12500

PROPOSED PROJECT

The area of Catia has approximately 100 Ha, which consist of land that was developed in 1934 for residential and industrial use.

Industrial areas have grown until today they cover about 25 Ha of the total land. The residential area have experienced deterioration due to the lack of control of commercial activities that originally were located in a disperse system throughout the development. Also, many houses changed in use from single family dwellings to tenements. In addition, the majority of the land around the area was developed into public housing projects and squatter settlements grew in the hills. Due to the proximity of the area to the city center and its industrial characteristics, it is commendable to do a renewal project in the more deteriorated area and try to solve the more important problems in the area like traffic congestion, industrial dispersion, etc. while at the same time taking into consideration the actual character of the area in relation to the city center. Some suggestions on this aspect has been compiled by the Metropolitan Planning Office, primarily in reference to industrial areas, densities, etc.

Some factors that may be given consideration in the actual development are: Lack of control of industrial areas, subutilization of private land in relation to the actual cost, lack of control of commercial activities, lack of land for semi-public uses, etc.

The proposal is intended to provide some suggestions which could be applied in the actual area and at the same time these suggestions could be applied for other similar cases in the city with primary application for deteriorated and older areas.

The area of Catia is defined to the north by Sucre Avenue, which is a meshing and at the same time a link to the city center. To the south Moran Avenue works like a barrier, while connecting the area with the city center in one direction and with the Junquito in the other direction. To the west Simon Bolivar Avenue operates as a meshing, and finally to the east there are two barriers, one being Caracas-La Guaira highway and the other being G Street.

The main access to the area of Catia is Sucre Avenue, which is characterized by relatively heavy, slow traffic. The second access by way of the Caracas-La Guaira highway, where the traffic is more fluid and congestion is almost non-existent. Finally the last access is by way of Moran Avenue, an access which presents many problems of traffic congestion due to the industrial area on one side of this circulation.

The area of Catia is surrounded by old speculative developments to the north (Los Magallanes), old public housing developments (Rafael Urdaneta and 23 de Enero) to the east and west, and finally to the south squatter areas which make-up a majority of the developments in this direction.

Three different land uses can be found in this area. The primary use is residential which accounts for approximately 55.61 Ha. The second use is industrial which takes up about 24.75 Ha. of the total area. It is important to notice that these industrial areas are in the majority concentrated with a few exceptions dispersed throughout the area. The final use is commercial and is primarily located between the Sucre and Perez Bonalde Plazas. Is important to notice that semipublic areas are almost non-existent, the exceptions being a few small primary schools.






The population density of the area is about 315 inhab/Ha (net density) which can be considered low in relation to the proximately of the city center and the cost of the land.

AREAS	Hectares	Percentages
Public	23.00	21.99
Semi-Public	1.21	1.15
Private	80.36	76.84
	104.57	100

NETWORK EFFICIENCY

$$R = \frac{\text{network length (circulation)}}{\text{areas served}} = 183.3 \text{ m/Ha.}$$

KEY Los Magallanes Old speculative development

-  RESIDENTIAL
-  COMMERCIAL
-  INDUSTRIAL
-  OPEN SPACES
-  CIRCULATION

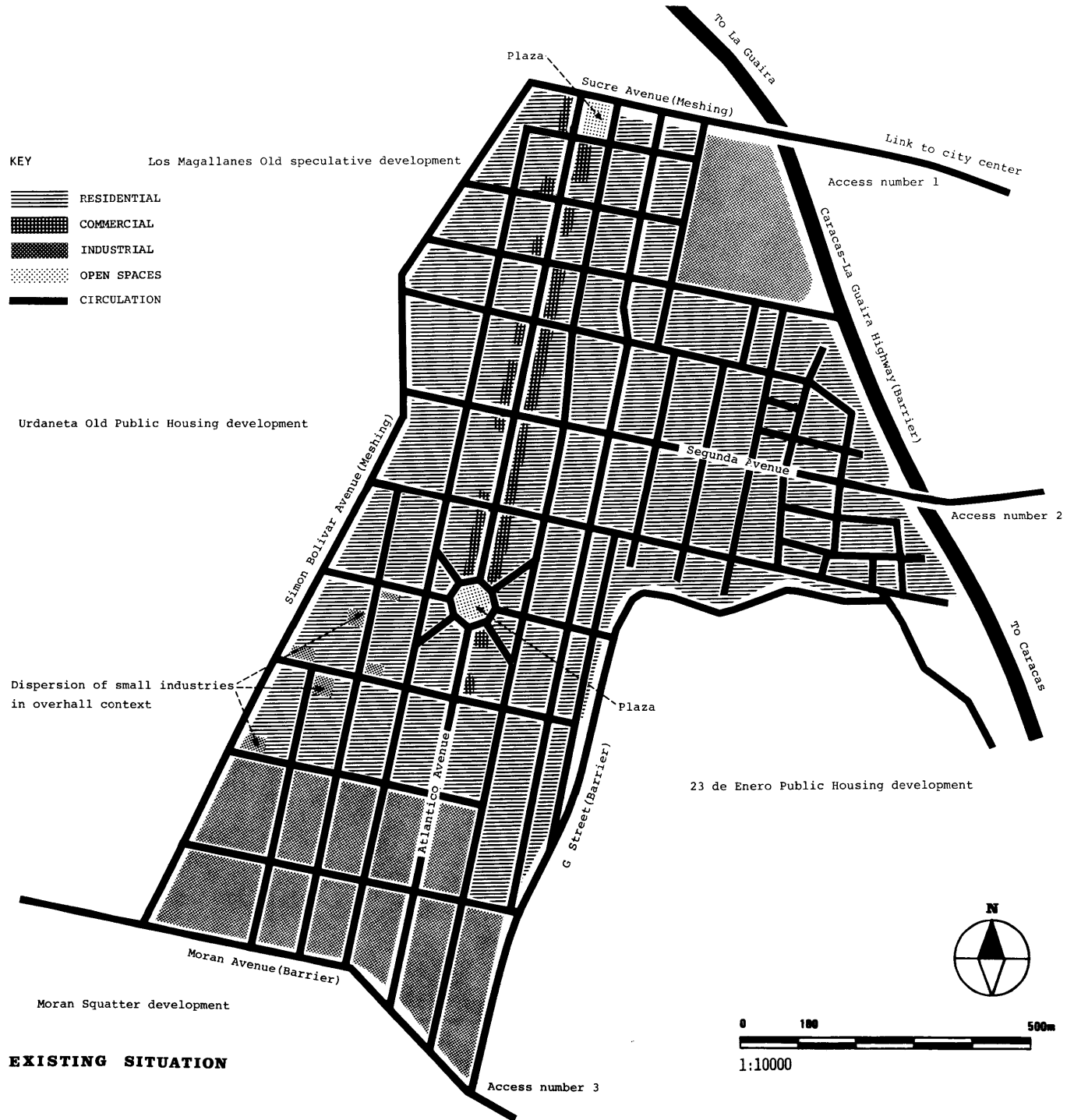
Urdaneta Old Public Housing development

Dispersion of small industries in overall context


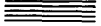



23 de Enero Public Housing development

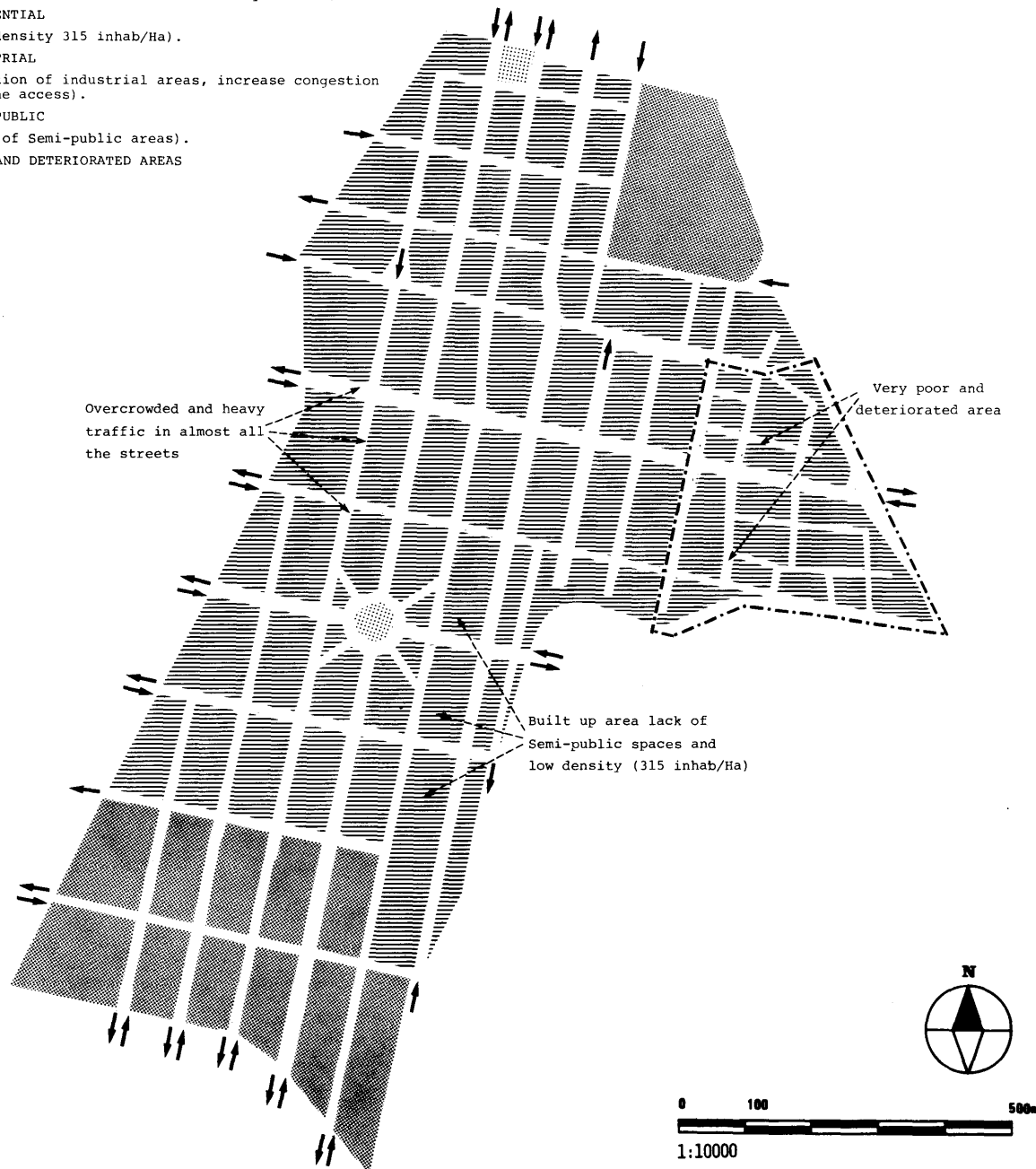
Moran Squatter development

EXISTING SITUATION



KEY

-  TRAFFIC
(Two way circulation, Slow and heavy traffic).
-  RESIDENTIAL
(Low density 315 inhab/Ha).
-  INDUSTRIAL
(Location of industrial areas, increase congestion on the access).
-  SEMI-PUBLIC
(Lack of Semi-public areas).
-  POOR AND DETERIORATED AREAS



PROBLEMS

The main problem in the area of Catia is traffic congestion, which results from several different factors. The primary factor which contributes to this problem is the heavy traffic that originates in the industrial areas located near the main access. In addition to this the majority of the streets are narrow (12 meters wide). Another factor that generates heavy traffic is the commercial activities on the main streets and lack of public parking. Finally, the majority of the streets have two way circulation.

The area of Catia has a net density of about 315 inhab/Ha which is low in relation to surrounding areas and results primarily from the high cost of the land. Other areas around Catia have higher density of 650 inhab/Ha and in some cases 800 inhab/Ha. It is important to notice that the high cost of the land is due to the proximity of the area of Catia to the city center. In other words, the present density of the area is considered subutilized in terms of availability of flat land in the city and primarily results from the high cost of land.

The area of Catia was developed many years ago and semi-public activities were not taken into consideration. Presently these semi-public areas are needed because of the increase of the population and the fact that existent areas consist almost entirely of two plazas on the Atlantico Avenue and some small schools.

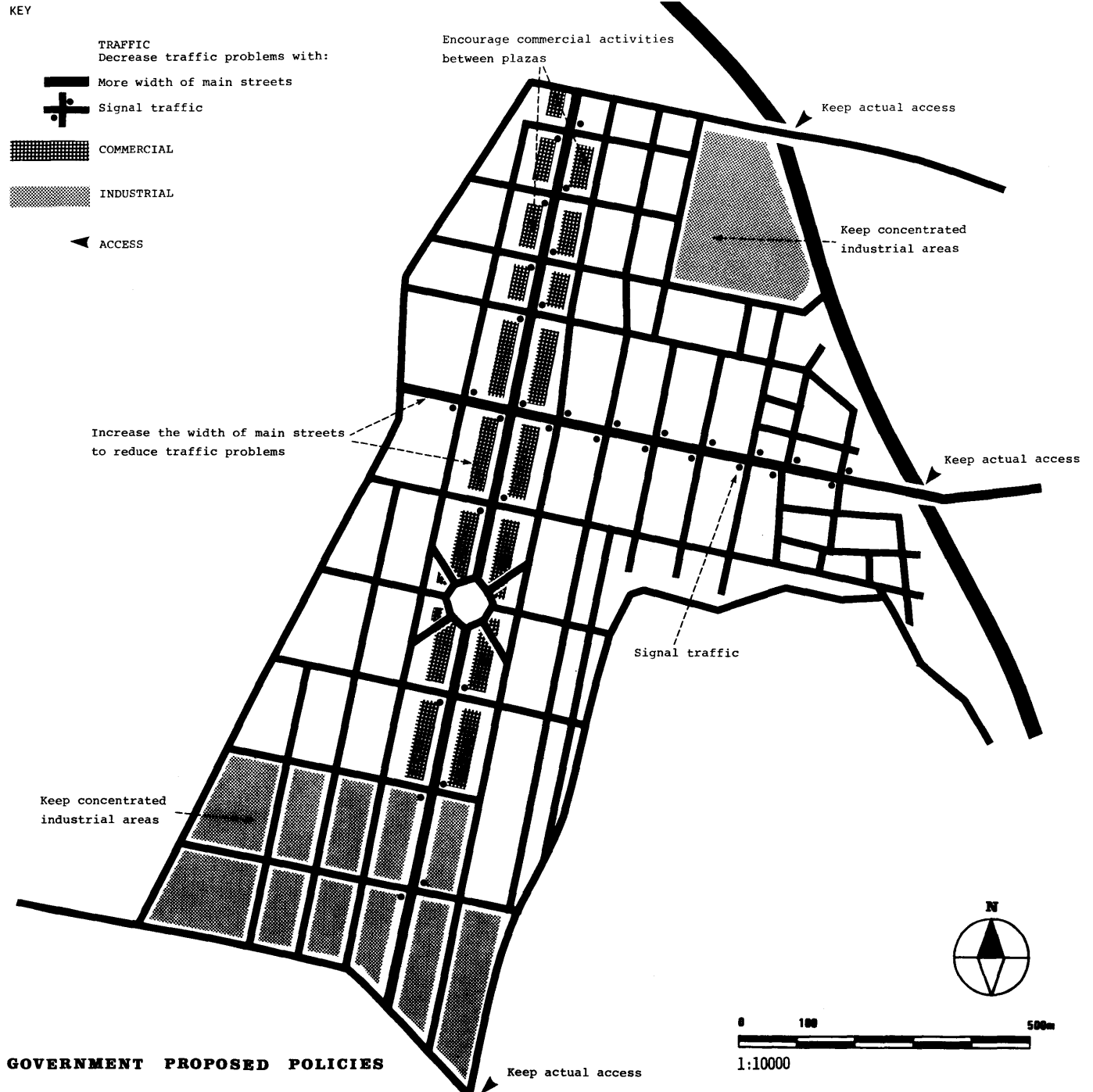
Finally, the area of Catia can be divided into three sectors: Catia old area, Perez Bonalde and Nueva Caracas. This last sector presents many different problems but the most important are the poor layout of the streets and the extremely deteriorated quality of the houses.

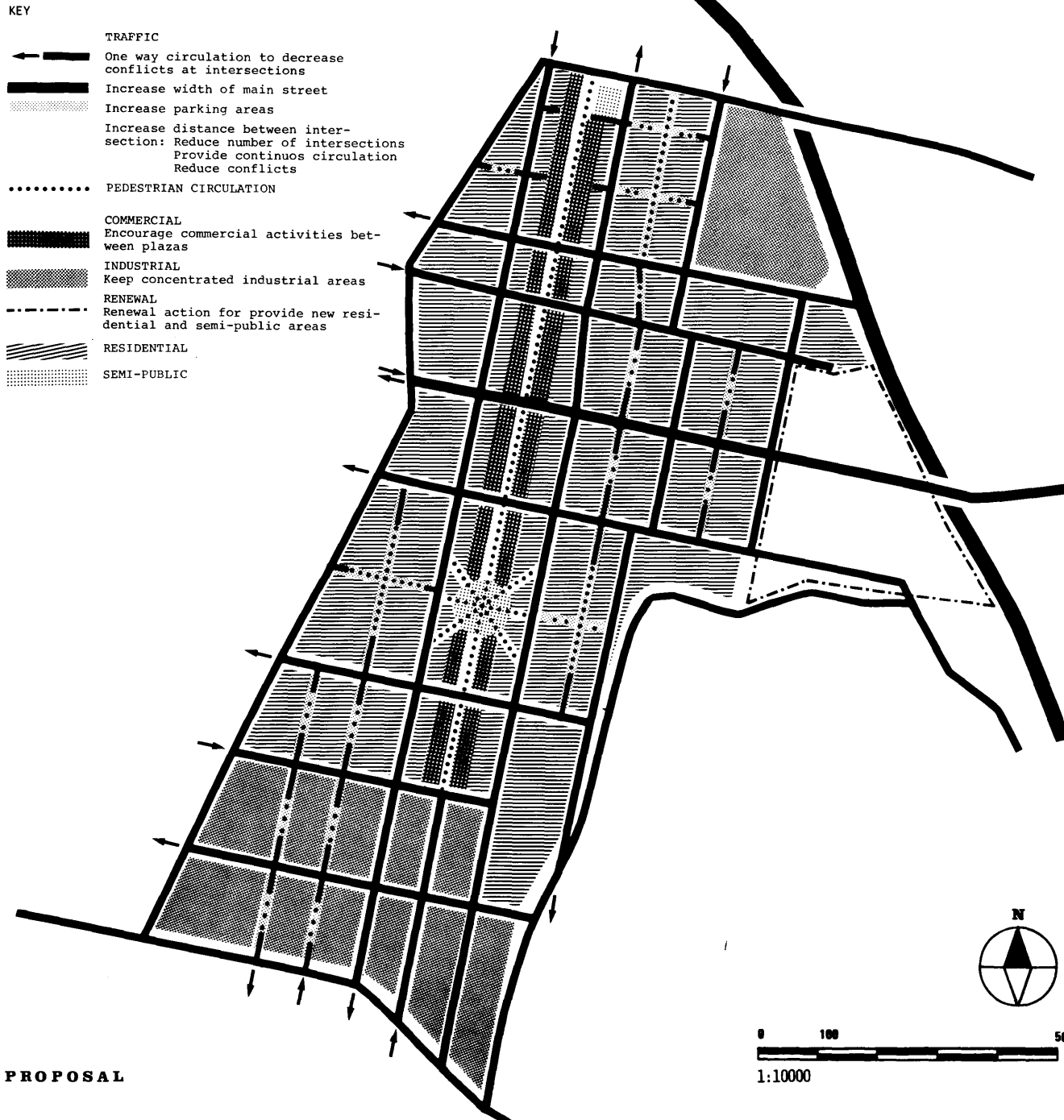
The major goal of the Government proposal policies is to maintain the Catia area as subcenter of the Caracas city center. In other words, the desire is to keep the actual general characteristics of Catia but improve some urban conditions by such means as: Relocation of small industries now dispersed which generate conflicts of traffic and flow of the circulation.

The second goal is to encourage commercial activities primarily between Sucre Plaza and Perez Bonalde Plaza. The present commercial activities are grouped in a corridor system and there is a strong trend to increase on both sides of the main street and between the plazas.

Another important aspect that must be considered is the concentrated industrial activities which must be retained, as they are basic in maintaining the level of employment in the area.

Finally, further aspects that must be taken into consideration center around the present means of access to the area and the traffic problems encountered. In order to decrease these traffic problems, signal devices could be installed on the corner of main streets, the width of these main streets increased in order to the congestion and obtain a more continuous circulation when these streets enter commercial areas and an emphasis on maintaining the present residential use of the area but with an increase in the density.





The main idea of this proposal is try to keep the actual character of the area but to improve and solve the major problems found here. In general the major problems are the following: Traffic conqestion, lack of semi-public spaces, and finally, a very poor and deteriorated section in one part of the Catia sector.

In relation to these problems, traffic congestion on the main streets has been given primary consideration. This congestion is basically due to the commercial activities which now exist and are in the process of incremental growth. A suggestion in this proposal is to change the vehicular circulation to pedestrian circulation on the main street, a solution which is also applicable to the majority of secondary streets in a north-south direction, with the double purpose of increasing the parking areas on these streets and semi-public spaces and at the same time to reduce maintenance cost, etc. Along with this all the streets should be one way circulation with the idea of decreasing the number of intersections, providing a more continuous flow of traffic and with this reducing conflicts and congestion.

In relation to access, it is proposed that the width of the main street which connects with the Caracas-La Guaira highway be increased. Two way circulation is also proposed for this avenue. In other aspects such as retention of concentrated industrial areas, access, etc. this proposal is in accordance with the government proposal.

Finally, the area called Nueva Caracas is proposed for a renewal program with the idea of increasing the actual density in the area and the number of semi-public spaces. This renewal process must be continued in the future for the total area of Catia and in accordance with the renewal pattern applied in the Nueva Caracas area.

AREAS	Hectares	Percentages
Public	11.50	11.00
Semi-Public	12.71	12.16
Private	80.36	76.84
	104.57	100

NETWORK EFFICIENCY

$$R = \frac{\text{network length (circulation)}}{\text{areas served}} = 123.00 \text{ m/Ha.}$$

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. (See also: REFERENCES).

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)

ALTERNATING 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.)

CONURBATION. Area of large urban communities where towns, etc. have spread and became joined beyond their administrative boundaries. (A.S. Hornby, A.P. Cowie, J. Windsor Lewis, 1975)

CONURBATION. An aggregation or continuous network of urban communities. (Merriam-Webster, 1963)

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, separated from others. (U.S.D.P.)

DEVELOPMENT. Gradual advance or growth through progressive changes; a developed tract of land (U.S.D.P.)

DEVELOPMENT SIZE. There are two general ranges of size: *LARGE*: may be independent communities requiring their own utilities, services, and community facilities; *SMALL*: generally are part of an adjacent urbanization and can use its supporting utilities, services, 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, channel, etc. (DePina, 1972)

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

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

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

DRAINAGE. Interception and removal of ground water 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 building/shelter in which people live. A dwelling contains one or more 'dwelling units'. (U.S.D.P.)

DWELLING BUILDER. Four groups are considered: *SELF-HELP BUILT*: where the dwelling unit is directly built 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; payments 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 is defined by the scale of operations, financially and materially; the scale being limited to the construction 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 scale of operations, financially and materially; the scale reflects a more comprehensive and larger size of operations encompassing the building of large quantities of similar units, or a singularly large complex. (U.S.D.P.)

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

DWELLING DEVELOPER. Three sectors are considered in the supply of dwellings: *POPULAR SECTOR*: the marginal sector with limited or no access to the formal financial, administrative, legal, technical institutions involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Popular Sector generally for 'self use' and sometimes for profit. *PUBLIC SEC-*

TOP: 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 (m²) 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. (NOTC 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 odorless 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 responsibility. **PUBLIC** (streets, walkways, open spaces): user -anyone/unlimited; physical controls -minimum: responsibility -public sector. **SEMI-PUBLIC** (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/OPTIMIZE.** 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 protected 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 FACILITIES.** 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 thoroughfare 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 differing 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)

VIIEWS. 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 horsepower 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.)

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EXPLANATORY NOTE

QUALITY OF INFORMATION

The quality of information given in drawings, charts, and descriptions has been qualified in the following manner:

Approximate: when deducted from different and/or not completely reliable sources.

Accurate: when taken from reliable or actual sources.

Tentative: when based upon rough estimations of limited sources.

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 to a locality.

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. m	= 2.4711 acres
1 square foot		= 0.0929 square meters
1 acre		= 0.4087 hectares

DOLLAR EQUIVALENTS

All money data has been expressed in terms of the US Dollar. 1 US Dollar = 4.35 Venezuelan Bolivares.