URBAN DWELLING ENVIRONMENTS: BOGOTA, COLOMBIA

by

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Signature of Author.............................

Department of Architecture, May 7, 1976

Certified by...........................................

Thesis Supervisor

Accepted by...........................................

Chairman, Department Committee on Graduate Students

Archives

AUG 16 1976
ABSTRACT

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

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

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

Thesis Supervisor: Horacio Caminos
Title: Professor of Architecture
ACKNOWLEDGEMENTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

URBAN CONTEXT

1. Bogota is located on the eastern part of the fertile and extensive plateau called 'Sabana de Bogota' in the Eastern Mountain chain, one of the three branches of the Andes in the Colombian territory. The geographical situation of the city is considerably central in relation to the rest of the country. Latitude is 40° 35' 56.57" North and longitude, 74° 04' 51.13" West. The average temperature is 14° C, corresponding to the equinox to the rain periods and the solstice to dry and warm periods.

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

3. In 1972 the annual family income was U.S. $ 1,900. The population able to work represents 30.1% of the total; 62.7% of that percentage corresponds to white collar workers and 12.8% are laborers. The manufacturing industry is 25% of the total national gross. The construction of buildings occupied 90% of the construction industry in the period 1960-70. Of the population able to work 16.1% does not have a job; the participation of the city in the internal national gross product fluctuates between 20% and 30%.
4. Bogota is the seat of the National Government, of the Department, and of the city itself. It became Special District in order to control the growth of the city and to acquire domain and jurisdiction over its neighboring municipalities. Bogota is ruled by a Major Mayor, a Council and 17 Minor Mayors.

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

6. In 1972 in Colombia the ethnic divisions were represented by the following percentages: 20% white population, 76% mestee, 5% native indigenous, and 9% blacks. In Bogota the white percentage increases considerably, while the percentage of mestees decreases due to the many European type inhabitants, and because Bogota was one of the most important cities in Latin America chosen by the Spanish for their colonies. The percentages of incomes reflect the situation of those of the ethnic groups, with the white population having incomes more than U.S. $170 and the minorities U.S. $70 per month.

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

8. There are lots without services found in "Barrios Piratas" (clandestine urbanizations) with prices as low as U.S. $4,50 Mt². The minimum area allowed for lots according to statute of the council of 1965-1967 was 65 Mt², but there are lots of 7 by 7 Mt² found in clandestine urbanizations. The system of increasing amortization has replaced the system of fixed quota in acquiring properties. In 1970 the value of a minimum complete dwelling was calculated in U.S. $1,200 with a minimum required monthly income of U.S. $ 60 for credit. From these figures it is evident that only 35% of urban families can afford a minimum complete dwelling. The accumulative deficit of dwelling units until 1970 was 135,000 units and it has been estimated that there will be an accumulative deficit of 330,000 units before 1980, with a resulting deficit of 70,000 units per year with only 10,000 to 15,000 units being built by Government and Public Organizations. The minimum existing dwelling is estimated at 40 Mt² with a cost of U.S. $15 Mt².

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

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

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

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

(bottom right) High income houses in large lots in the northern part.
URBAN CONTEXT SOURCES:

- **Climate**: (accurate) SERVICIO COLOMBIANO DE MÉTEROLOGIA, 1975.
- **Urban Annual Income Distribution**: (accurate) BOGOTA, SU DESARROLLO Y PRESERVACIÓN DEL MEDIO AMBIENTE.
- **Photographs**: MONJUTO MIRELLIN, ARTURO Roldán Ocampo, 1976.
- **Urban Land Use Pattern**: UNIVERSIDAD NACIONAL, FACULTAD DE ARTE, 1975.
- **Urban Income Pattern**: (accurate) PLANO ESTUDIO SOBRE FILTRACIÓN EN BOGOTA, 1975.
- **Concejo de Bogota, 1960. EL FUTURO DE BOGOTA, 1974.

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

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

Ciudad Kennedy, Bogota: (top left) Commercial street with small dwellings numberless adapted to variety of uses. (top right) Commercial Street. The dwellings are transformed according to the economical well-being and private initiative of the people. (bottom) Air view looking towards the West. In the foreground the Experimental Plan is under construction. Farther, the Superblock 2.
The locality is clearly identifiable from the neighboring localities due to the main streets that bound it and the interior street system that unifies the layout. At sight, it is difficult to appreciate the enormous size of the locality because of the system of few superblocks, each one with its own identity, independent of one another, and separated each one from the rest by wider streets. Unlike these streets there are narrow streets serving the interior of each superblock and the frequency between them depends on the dimension of the lots. The concept of superblock appears more clearly on those with multi-family buildings due to less fragmentation by interior streets, continuity of open spaces and rigidity of the buildings. The dwellings in private lots appear more transformed and enlarged in the vicinity of commercial areas and bus routes.
LAND USE: As mentioned before, the locality is very well equipped in community facilities. Each superblock is almost self-sufficient in this area. The minor commerce is spread all over the locality with some concentration of it along the carrera 76, which was the first commercial street developed and is an important route of buses. Many of the dwelling units have been adapted to different uses, such as small stores, doctors’ offices, restaurants, carpenter workshops, kindergartens, etc. In the near future the construction of a hospital has been predicted. A huge Central for provisions of food is near by, and the Fire Department is one of the most important in Bogota, but it was impossible to locate it in this plan; the mail boxes are everywhere in small stores, drugstores, etc.

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

LOCALITY CIRCULATION PATTERN
SUPERBLOCK 6A AIR PHOTOGRAPH

1:2500
CASE STUDY: SUPERBLOCK 6A

LOCALITY BLOCK LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th>LOCALITY</th>
<th>BLOCK LAND UTILIZATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENSITIES</td>
<td></td>
</tr>
<tr>
<td>Lots</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>LOTS</td>
<td>567</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>549</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>4552</td>
</tr>
<tr>
<td>AREAS</td>
<td></td>
</tr>
<tr>
<td>PUBLIC (streets, walkways, open spaces)</td>
<td>5.97</td>
</tr>
<tr>
<td>SEMI-PUBLIC (open spaces, schools, community centers)</td>
<td>2.24</td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>7.55</td>
</tr>
<tr>
<td>SEMI-PRIVATE (cluster courts)</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>15.76</td>
</tr>
</tbody>
</table>
SUPERBLOCK 6A, Ciudad Kennedy: (top left) The solid school building highly contrast with the dwellings and public way. Outside it the streets generally lack of good maintenance.

(top right) Pedestrians way. Frequently, nobody takes responsibility of public areas.

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

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

1:200
CASE STUDY: SUPERBLOCK 6A

SUPERBLOCK 6A, Ciudad Kennedy: (left) Typical dwelling of self-help development. It maintains the original condition of construction.
(center) The private property is well defined. The people take the resort of small business to improve their resources.
(right) Small houses are subdivided and even tiny spaces are rented to enlarge the incomes of their owners.

PHYSICAL DATA
(related to dwelling and land)

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

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

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

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

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

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

SOCIO-ECONOMIC DATA
(related to user)

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

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

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

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

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

DWELLING UNIT PAYMENTS
- financing: PRIVATE/PUBLIC FINANCING
- rent/mortgage: U.S. $ 2.5
- % income for rent/mortgage: 56%
SUPERBLOCK 2 AIR PHOTOGRAPH

1:2500
CASE STUDY: SUPERBLOCK 2

LOCALITY BLOCK LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th>DENSITIES</th>
<th>Total Number</th>
<th>Area Hectares</th>
<th>Density N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>73</td>
<td>9.98</td>
<td>7.31</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>1069</td>
<td>9.98</td>
<td>107.11</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>6900</td>
<td>9.98</td>
<td>691.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways, open spaces)</td>
<td>6.94</td>
<td>69.54</td>
</tr>
<tr>
<td>SEMI-PUBLIC (open spaces, schools, community centers)</td>
<td>0.99</td>
<td>9.94</td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>7.05</td>
<td>20.52</td>
</tr>
<tr>
<td>SEMI-PRIVATE (cluster courts)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

TOTAL 9.98 100
LAND UTILIZATION DIAGRAMS

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

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

DENSITY Persons/Hectare 692

SUPERBLOCK 2, Ciudad Kennedy: (top left) Playground. These facilities are not completely utilized although the infantile population is considerable.
(top right) Commercial Area. The character of use is not clear. The users try to define their surrounding yards.
(bottom left) Parking space. The initial destination of spaces is changed according to the spontaneity and necessities of the users.
(bottom right) Collector street. In some places the streets are overdesigned and therefore wasted.
### Physical Data

<table>
<thead>
<tr>
<th>Dwelling Unit</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Apartment</td>
</tr>
<tr>
<td>Area (sq m)</td>
<td>63.51</td>
</tr>
<tr>
<td>Tenure</td>
<td>Legal rental</td>
</tr>
<tr>
<td>Land/Lot Area (sq m)</td>
<td>295.6</td>
</tr>
<tr>
<td>Tenure</td>
<td>Legal ownership</td>
</tr>
<tr>
<td>Dwelling Type</td>
<td>Walk-up</td>
</tr>
<tr>
<td>Number of Floors</td>
<td>4</td>
</tr>
<tr>
<td>Utilization</td>
<td>Multiple: Family</td>
</tr>
<tr>
<td>Physical State</td>
<td>Good</td>
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</table>

### dwelling development

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
</tr>
<tr>
<td>Developer</td>
</tr>
<tr>
<td>Builder</td>
</tr>
<tr>
<td>Construction Type</td>
</tr>
<tr>
<td>Year of Construction</td>
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</tbody>
</table>

### Materials

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
</tr>
<tr>
<td>Floors</td>
</tr>
<tr>
<td>Walls</td>
</tr>
<tr>
<td>Roof</td>
</tr>
</tbody>
</table>

### Dwelling Facilities

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC</td>
</tr>
<tr>
<td>Shower</td>
</tr>
<tr>
<td>Kitchen</td>
</tr>
<tr>
<td>Rooms</td>
</tr>
<tr>
<td>Other</td>
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### Socio-Economic Data

<table>
<thead>
<tr>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>General: Social</td>
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<td>User's ethnic origin</td>
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<tr>
<td>Place of Birth</td>
</tr>
<tr>
<td>Education Level</td>
</tr>
<tr>
<td>Number of Users</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

### Migration Pattern

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Moves</td>
</tr>
<tr>
<td>Rural - Urban</td>
</tr>
<tr>
<td>Urban - Rural</td>
</tr>
<tr>
<td>Why came to urban area</td>
</tr>
</tbody>
</table>

### General: Economic

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>User's Income Group</td>
</tr>
<tr>
<td>Employment</td>
</tr>
<tr>
<td>Distance to work</td>
</tr>
<tr>
<td>Mode of travel</td>
</tr>
</tbody>
</table>

### Costs

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwelling Unit</td>
</tr>
<tr>
<td>Land - Market Value</td>
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</table>

### Dwelling Unit Payments

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing</td>
</tr>
<tr>
<td>Rent/Mortgage</td>
</tr>
<tr>
<td>% Income for rent/mortgage</td>
</tr>
</tbody>
</table>
EXPERIMENTAL PLAN SUPERBLOCK AIR PHOTOGRAPH

1:2500
CASE STUDY: EXPERIMENTAL PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th>Localities</th>
<th>Total Number</th>
<th>Area Hectares</th>
<th>Density N/A</th>
<th>Percentages</th>
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</thead>
<tbody>
<tr>
<td>Lots</td>
<td>28</td>
<td>4.25</td>
<td>6.59</td>
<td>56.45</td>
</tr>
<tr>
<td>Dwelling Units</td>
<td>278</td>
<td>4.25</td>
<td>65.41</td>
<td>15.26</td>
</tr>
<tr>
<td>People</td>
<td>1800</td>
<td>4.25</td>
<td>423.53</td>
<td>25.72</td>
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<td>Areas</td>
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<tr>
<td>Public</td>
<td>2.4</td>
<td>56.45</td>
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<tr>
<td>Semi-Public</td>
<td>0.65</td>
<td>15.26</td>
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<td></td>
</tr>
<tr>
<td>Private</td>
<td>0.11</td>
<td>25.72</td>
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<td></td>
</tr>
<tr>
<td>Semi-Private</td>
<td>1.9</td>
<td>2.57</td>
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</tr>
<tr>
<td>Total</td>
<td>4.25</td>
<td>100</td>
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<td></td>
</tr>
</tbody>
</table>
LAND UTILIZATION DIAGRAMS

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

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

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

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

PATTERN

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

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

DENSITY Persons/Hectare 422

SUPERBLOCK LAND UTILIZATION
### Physical Data
*(related to dwelling and land)*

<table>
<thead>
<tr>
<th>DWELLING UNIT</th>
<th>DWELLING DEVELOPMENT</th>
<th>MATERIALS</th>
<th>DWELLING FACILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>type:</strong> Apartment</td>
<td><strong>mode:</strong> Instant</td>
<td><strong>foundation:</strong> Reinforced Concrete for Base of Columns</td>
<td><strong>WC:</strong> 1</td>
</tr>
<tr>
<td><strong>area (sq m):</strong> 92.16</td>
<td><strong>developer:</strong> Public</td>
<td><strong>floors:</strong> Prefabricated Concrete</td>
<td><strong>shower:</strong> 1</td>
</tr>
<tr>
<td><strong>tenure:</strong> Legal Ownership</td>
<td><strong>builder:</strong> Large Contractor</td>
<td><strong>walls:</strong> Rubble Masonry</td>
<td><strong>kitchen:</strong> 1</td>
</tr>
<tr>
<td><strong>LOT:</strong> Private</td>
<td><strong>construction:</strong> Masonry Concrete</td>
<td><strong>roof:</strong> Asphalt on Prefabricated Slab</td>
<td><strong>rooms:</strong> 3</td>
</tr>
</tbody>
</table>

- Physical state: Good
- Location: Periphery
- Number of floors: 4
- Utilization: Multiple: Family
- Type: Walk-Up/Grouped
- Number of moves: None
- Rural - Urban: -
- Urban - Rural: -
- Why came to urban area: -

### Socio-Economic Data
*(related to user)*

<table>
<thead>
<tr>
<th>GENERAL</th>
<th>SOCIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>user's ethnic origin: Western Plains</td>
<td>place of birth: Lucerna, Casanare</td>
</tr>
<tr>
<td>education level: 3 years University</td>
<td></td>
</tr>
</tbody>
</table>

- **NUMBER OF USERS**
  - Married: 2
  - Single: -
  - Children: 4
  - Total: 6

- **MIGRATION PATTERN**
  - Number of moves: None
  - Rural - Urban: -
  - Urban - Rural: -
  - Why came to urban area: -

- **GENERAL: ECONOMIC**
  - user's income group: Middle
  - employment: Official
  - distance to work: 8 km.
  - mode of travel: Bus

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

- **Dwelling Unit Payments**
  - Financing: Private/Public Financed
  - Rent/Mortgage: U.S. $ 41
  - % income for rent/mortgage: 46%

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

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

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

### Case Studies Sources:
- Locality Land Use Patterns: (accurate) EQUIPAMIENTO CONUNITARIO CIUDAD KENNEDY, 1976.
- Locality Circulation Patterns: (approximate) FIELD SURVEY, JOSE ENRIQUE ROBLEDO, 1975.
- Socio-Economic Data: (approximate) FIELD SURVEYS, ELSA CHAVEZ, JOSE ENRIQUE ROBLEDO, 1975.
PROPOSAL

DESIGN CRITERIA

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

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

Unlike the existing project, dwellings in private lots were proposed grouping them in the interior space constituted by the walk-ups of each block. These dwellings occupy lots with similar area to those used in the rest of the locality. Also, in front of those dwellings there are lower buildings as a result of the criteria assumed initially; a vehicular access, is also possible to the semiprivate courts. The buildings along the two less important peripherical streets are of less height; the apartments with larger area as well as the commercial uses were located preferably on the main corners of the main street.
It was decided to make the proposal joining the Superblocks 2 and Experimental Plan, because of vicinity reasons between them and to work with a larger area in order to include the minimum communal utilities in a comfortable way, and also to maintain a point of reference with all the other superblocks of Ciudad Kennedy, which areas are equivalent to that of the proposal. This assumed criteria contains the definition of superblock with more important streets surrounding it, to communicate the superblock with the rest of the locality; with interior streets dominated by pedestrians and with enough area so that the superblock can have its own identity.

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

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

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

LOCALITY BLOCK LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th>DENSITIES</th>
<th>Total Number</th>
<th>Area Hectares</th>
<th>Density N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>311</td>
<td>14.23</td>
<td>44.66</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>1367</td>
<td>14.23</td>
<td>93.66</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>8700</td>
<td>14.23</td>
<td>611.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Nectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways, open spaces)</td>
<td>4.00</td>
<td>28.40</td>
</tr>
<tr>
<td>SEMI-PUBLIC (open spaces, schools, community centers)</td>
<td>2.67</td>
<td>18.79</td>
</tr>
<tr>
<td>PRIVATE (dwelling, shops, factories, lots)</td>
<td>3.93</td>
<td>27.64</td>
</tr>
<tr>
<td>SEMI-PRIVATE (cluster courts)</td>
<td>3.55</td>
<td>24.89</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14.23</td>
<td>100</td>
</tr>
</tbody>
</table>

1:2500
LAND USE

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

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

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

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

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

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

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

LAND UTILIZATION DIAGRAMS

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

PERCENTAGES
- Streets/Walkways: 28.68%
- Playgrounds: 18.79%
- Cluster Courts: 24.09%
- Dwellings/Lots: 27.44%

DENSITY
- Persons/Hectare: 611

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

<table>
<thead>
<tr>
<th>Number</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>91 Mts.</td>
</tr>
<tr>
<td>110</td>
<td>79 Mts.</td>
</tr>
<tr>
<td>1040</td>
<td>66 Mts.</td>
</tr>
<tr>
<td>129</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1347</strong></td>
</tr>
</tbody>
</table>

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

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

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

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

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Unit Area + Circulation (Square Meters)</th>
<th>Block Number Units</th>
<th>Proposal Number Units</th>
<th>Block Building Areas (Square Meters)</th>
<th>Proposal Building Areas (Square Meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APARTMENT A</td>
<td>98</td>
<td>6</td>
<td>68</td>
<td>508</td>
<td>6664</td>
</tr>
<tr>
<td>APARTMENT B</td>
<td>86</td>
<td>28</td>
<td>110</td>
<td>2408</td>
<td>2460</td>
</tr>
<tr>
<td>APARTMENT C</td>
<td>73</td>
<td>164</td>
<td>1040</td>
<td>11972</td>
<td>75920</td>
</tr>
<tr>
<td>DWELLING</td>
<td>60 (Basic Shell)</td>
<td>24</td>
<td>129</td>
<td>1440</td>
<td>7740</td>
</tr>
<tr>
<td>SHOP</td>
<td>73</td>
<td>7</td>
<td>42</td>
<td>511</td>
<td>3066</td>
</tr>
</tbody>
</table>

Total 229

PROPOSAL BLOCK PLAN: DWELLING UNITS
CIRCULATION AND STORM DRAINAGE

ELECTRICITY AND STREET LIGHTING
EVALUATIONS

LAND UTILIZATION:
PATTERNS, PERCENTAGES, DENSITIES

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

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

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

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

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

QUALITY OF INFORMATION: Approximate
**SUPERBLOCK 6A**

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

**SUPERBLOCK 2**

Public walk-up apartments
A very high percentage of land for public use is constituted by streets, and large open spaces with no control. The percentage of semipublic land is minimum. All the private land is occupied by the buildings. A high number of population does not have enough communal spaces.
Similar cases: 2, 4.

**EXPERIMENTAL PLAN**

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

**S.BLOCK 2 & EXP. PLAN**

Public walk-up apartments
The combination of these two projects joins the disadvantages of both of them without taking any of the advantages. Percentage of public land slightly decreases compared with case 2. Semipublic percentage continues low. Semiprivate areas are even smaller, and private percentage is very low. In addition, the population density is now lower.
Similar cases: 2, 4.

**PROPOSAL**

Walk-up apartments and row houses
Low percentage of land for streets and walkways. Comfortable areas for communal spaces. Controlled and useful semipublic spaces. Land with private utilization is sheltered and also used for private yards. In addition a high population density.
Similar cases: none.
GLOSSARY

The criteria for the preparation of the definitions as follows:
-FIRST PREFERENCE: definitions from Webster's New World Dictionary (U.S.D.P.).
-SECOND PREFERENCE: definitions from standard urban design dictionaries, textbooks, or reference manuals.
-THIRD PREFERENCE: definitions from the Urban Settlement Design Program (U.S.D.P.) files. They are used as the last resort when existing sources were not felt appropriate or satisfactory.

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

Actual land cost. "The cost of land itself...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; it can be assessed by local governments on an ad valorem or even usually the market value, but only a valuation for tax purposes. (U.S.D.P.)

Air pollution. The act or process of destroying the air, tranquility, or settled state of the environment by the annoyance of air noise, vibration, hazards, etc. (U.S.D.P., 1971)

Airport zoning restrictions. The regulation of the height or type of structures in the path of moving vehicles. (U.S.D.P.)

AlTERNATIVE (AC). An electric current that reverses its direction of flow at random intervals. (N.O.T.C. 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. (L.Int.W., 1971, 1971)

Anspex. Appare (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 producing one volt applied across a resistance of one ohm. (N.O.T.C. 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 (pedestrians/automobiles) 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 governmental power 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 curvatures, trench cleaning, pipeline connections or 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 barrier line that tends to separate or restrict the free movement (to and from the site) of people, vehicles, or goods. (U.S.D.P.)

Betterment (Tax). A tax on the increase 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. (DePina, 1972)

Bituminous. A coating of or containing bitumin; as asphalt or tar. (DePina, 1971)

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

Borrowing. 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 buildings, and structures within or on the city, and certain equipment specifically regulated therefor." (DePina, 1971)

Building drain. Lowest horizontal piping of the building drainage system receiving discharge from soil, waste, or rainwater pipes. It is connected to the building sewer. (N.O.T.C. 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 distribution system of a building. (N.O.T.C. 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 waste liquid into the surrounding soil. (Merriam-Webster, 1971)

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

Clay. A lessor cohesive 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 turn and other points of collection. (N.O.T.C. 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)

Combined sewer. A sewage network, comprised of house service, collection lines, manholes, laterals. (U.S.D.P.)

Communal sewer. A sewer that carries both storm water and sanitary or industrial wastes. (DePina, 1971)

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, recreation, or release from boredom, worry, or tension. (U.S.D.P.)

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

Comodinium. A system of direct ownership of a single dwelling unit. The individual owns the unit in 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 area and improvements. Two types of comodiniums are recognized: horizontal, detached, semi-detached, row-houses; vertical, walk-up, high-rise dwelling types. (U.S.D.P.)

Conduits. Materials which allow current to flow such as aluminum, copper, iron. (N.O.T.C. 45-7, 1953)

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

Consort. An easement acquired by the public and designed to open privately owned lands for development and reconstruction. The use of private land in order to preserve open space and protect certain environmental and structural maintenance. (DePina, 1971)

Construction boring. A subsurface boring done at the planned location of all infrastructure and building footings and slab areas for the design of foundation systems. (U.S.D.P.)

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

Corporation code/corporation stop. A water or gas hook by means of which utility-company employees can connect or disconnect service lines to a customer. (Merriam-Webster, 1971)

Cost of urbanization. Include the following: capital cost of land and infrastructure; operating cost; cost of administration, maintenance, etc.; direct costs: include capital and operating costs; indirect costs: include environmental and personal effects. (U.S.D.P.)

Current (see: Alternating current, Direct current). An electric current of positive or negative electric particles (as electrons) accompanied by 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 alteration, or other periodic process. (Merriam-Webster, 1971)

Dan. A barrier preventing the flow of water; a barrier built across a stream and kept back flowing water. (Merriam-Webster, 1971)

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

Detached dwelling. Individual dwelling unit, separate 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 sizes: large, may be independent communities required to embody their own utilities, services, and community facilities; small, may be buildings, streets, provision for public use 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. (N.O.T.C. 45-7, 1953)

Discharge (Q). Flow from a culvert, sewer, channel, etc. (DePina, 1971)

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 or ad joining them (paths of travel). (Merriam-Webster, 1971)

Distribution system. The part of an electric utility system between bulk power sources (as generating stations or transmission stations transferred from transmission lines) and the consumers' service switches. (Merriam-Webster, 1971)

Disturbed soil. Soils that have been disturbed by artificial processes such as excavation, transportation of materials, installation of utilities, and other operations. (DePina, 1971)

Drainage. Interception and removal of ground water or surface water, by artificial or natural means. (DePina, 1971)

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

Dwelling. The general, general designation of a building in which persons live. (DePina, 1971)

Dwelling builder. Four groups are considered: (1) Self help dwelling; (2) totally or partially built by a skilled craftsman hired by the user or occupant; (3) provided by a public agency where the dwelling unit is totally built by a skilled craftsman hired by the user or occupant; (4) built for sale or lease by the user or occupant; (5) provided by a public agency where the dwelling unit is totally built by a skilled craftsman hired by the user or occupant. (Merriam-Webster, 1971)

Dwelling density. The number of dwellings, dwelling units, people, or families per unit hectares. Gross density is the total number of people per one hectare, including both permanent and transient (e.g., tourists). Net density is the density of selected, discrete portions of an area (e.g. including only nontransient population). (DePina, 1971)

Dwelling developer. Three sectors are considered: the supply of dwellings: (1) the number of dwellings, dwelling units, or families per unit hectares. Gross density is the total number of people per one hectare, including both permanent and transient (e.g., tourists). Net density is the density of selected, discrete portions of an area (e.g. including only nontransient population). (DePina, 1971)
Glossary

involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Private Sector for (U.S.D.P.).

DEVELOPMENT MODE. Two modes are considered: FREESTANDING: generally associated with detached, semi-detached and row/group dwelling types. TWIN: double story; generally associated with detached, semi-detached and row/group dwelling types. TOWN: 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.)

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

DEWELLING LOCATION. Three sectors are considered in single or multi-center urban areas. Sectors are identified by the people living in the area. The three sectors are: CENTER: the area recognized as the core area of the urban structure, usually densely built-up sector; TRAM ZONE: the area located between the center and the city edges, generally a densely built-up sector; PERIPHERY: the area located between the inner rings and the rural areas; generally a sparsely built-up sector. (U.S.D.P.)

DEWELLING PHYSICAL STATE. A qualitative evaluation of the facilities providing services associated with the dwelling: 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 good state of structural stability, weather protection, and maintenance without deviation. (U.S.D.P.)

DEWELLING TYPE. The physical arrangement of the dwelling unit: DETACHED: individual dwelling unit, separate from others; SEMI-DETACHED: two dwelling units sharing a common wall; ROW/FOOTH: dwelling units grouped in two to five stories with stairs and lifts for vertical circulation. (U.S.D.P.)

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

DEWELLING UNIT AREA. The dwelling unit area $A$ is the floor, covered area of a dwelling unit. (U.S.D.P.)

DEWELLING UNIT COST. The initial amount of money paid for the dwelling unit or the payment necessary equivalent for repaying the dwelling unit. (U.S.D.P.)

DEWELLING UNIT TYPE. Four types of dwelling units are considered: ROOM: A SIMPLE SPACE usually bounded by partitions and specifically used for living: for example, a living room, a dining room, a bedroom, but not a bath/foodroom, study, 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 some common facilities (circulation, toilets, kitchen). APARTMENT: A MULTIPLE SPACE, with a shelter and the private use of the parcel of land on which it is built (open spaces) as well as the facilities available (SHARY): A SIMPLE MULTIPLE SPACE of private occupancy usually on a single level or story divided into several units by a wall or partition. (U.S.D.P.)

DEWELLING 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. Service: a right in respect of an object (as land owned by one person in view of such the object (land) is subject to a specified use or enjoyment by another person or 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. (Defina, 1972)

ELECTRIC FEEDER. That part of the electric distribution system between the service drop or drops and an electric service drop. (U.S.D.P.)

ELECTRIC SERVICE DROP. That part of the electric distribution system which supplies water directly from pipe. It requires adequate pressure for proper functioning.
Dwelling Environments

Urban (1971)

A receptacle (as in a barrel or hospital or enclosure (as in a camp) containing such a receptacle. (Merriam-Webster, 1971)

Layout. The plan or design of arrangement of essential components of a dwelling or small group of dwellings, including connections for water, gas, and electrical utilities. (U.S.D.P.)

Levels of Services. Two levels are considered: MIN-MIN, are admissible or levels possible below the standards; MIN-STANDARD, are levels set and established by authority, custom of general consent, as a model, example, or sample, or on a basis 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 network obstructions. (U.S.D.P.)

Location. A naturally self-contained residential area/zone/neighborhood/settlement within an urban area that contains one or more dwelling/land systems. (U.S.D.P.)

Locality. A relatively small urban area within which a definite character and layout of local public facilities, services, and natural features exist. (U.S.D.P.)

Location. The 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 neighborhood common court (owned in condominium).

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.)

Locomotive. In highway lighting, a complete lighting device or apparatus. (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 they agree. (U.S.D.P.)

Land-Mark 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 lanes, with 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. The qualification of a land around a dwelling in relation to user, physical control and responsibilities, including management of a town or city, or region, expressing official contemplations on the course of community, housing and community facilities should take, and making proposals for industrial settlement, commerce, population distribution and other aspects of growth and development. (Abraham, 1971).

Median Barrier. A double-faced guardrail in the median or island dividing two adjacent roadways. (De Pinza, 1971)

Mesher Boundaries. Characterized by continuing, harmonious, compatible, attractive, unbroken, unrelieved, unlined, LINES: property lines, political or municipal divisions, main streets, etc.; AMEND similar residential uses, compatible uses (as parks with residential). (U.S.D.P.)

Microclimate. The local climate of a given site or habitat with respect to its proximity 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 and water networks of a specific layout and lot. (U.S.D.P.)

Mutual Ownership. Private land ownership shared by two or more inhabitants and their heir under mutual agreement. (U.S.D.P.)

Natural Features. Prominent objects in or produced by nature. (U.S.D.P.)

Natural Insurmountable Obstructions. Soils that have not been disturbed by artificial means although natural features exist; they are admissible or possible levels below the surface of the ground to a sewer, for admitting light or for purposes of inspection. (U.S.D.P.)

Neutral Wire. Wire carrying no voltage between itself and a grounded conductor, to neutralize it. (U.S.D.P.)

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

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

Ohm (electrical). The unit of resistance to the flow of electricity. The higher the number of ohms, the less resistance the circuit has. When resistance is constant, amperage (and wattage) are in direct proportion to voltage. Resistance of a circuit in ohms is determined by the cross-sectional area of the wire. Ohms = volts/amperes. R = E/I. The practical 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 volt of power is dissipated when one ampere flows through it and that is taken as standard in the U.S. (U.S.D.P.; NOTC ST 45-7, 1953). Merriam-Webster, 1971)

Optimize/Optimize. To bring to a peak of economic efficiency, especially 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 which employs bacterial action to digest/ decompose wastes. (U.S.D.P.)

Percentage Benefit/Mortgage. The fraction of income allocated for dwelling rental or dwelling mortgage payments expressed as a percentage of total family income. (U.S.D.P.)

Pit Privy/Latrine. A simple hole in the ground, usually hand dug, covered with slab and protective superstructure; for disposal of human excreta. (Merriam-Webster, 1971)

Pit Privy/Latrine. A simple hole in the ground, usually hand dug, covered with slab and protective superstructure; for disposal of human excreta. (Merriam-Webster, 1971)

Pit Toilet. 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 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: (1) GROSS DENSITY: including all kinds of land utilization, residential, civic, public facilities, etc.; (2) NET DENSITY: including 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 in a person's name and his heirs without restriction of time. (U.S.D.P.)

Privy. A small, often detached building having a bench and a more or less oval hole through which the user may defecate or urinate into a pit or cesspool subsequently washed out with some 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, etc. made available to all members of a community. (U.S.D.P.)

Public Services and Community Facilities. Includes: public transportation, police protection, fire protection, refuse collection, 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, 1953)

Public Utilities. Includes: water supply, sanitation sewage, storm drainage, electricity, street lighting, telephone, circulation networks, etc. (U.S.D.P.)

Pump. A device or machine that raises, transfers or compresses fluids or that attains gases especially by compression or by suction. (Merriam-Webster, 1971)

Pump. A device or machine that raises, transfers or compresses fluids or that attains gases especially by compression or by suction. (Merriam-Webster, 1971)

Public Works. The activity of a local governmental authority or by an established public utility company which is controlled and regulated by a governmental authority. (HUD/AID, Minimum Standards, 1953)

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

Residential Area. An area containing the basic needs of housing, cooking, eating, clothing, washing, heating, education, recreation, shopping, work. (U.S.D.P.)

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

Right-of-Way. A legal right of passage over another person's property. (land) the area of way or strip through which a right-of-way exists such as a path or thoroughfare which one may lawfully walk or the strip of land devoted to or over which is built a public road, the land...
GLOSSARY

TAX EXEMPTION. A grant by a government of immunity from taxes: (a) ten-year tax exemption on new housing in New York stipulated new construction in the 1920's; (b) the access to a piece of land where people can build their own dwellings; (c) services: the opportunity for residents to take advantage of 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)

SLEEP. Degree or extent of devotion (of the land surface) for the provision of services for residential use and complementary commercial use. Site and service projects are aimed to improve the housing conditions for the relative or proportionate dimensions (of the site). (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 steps: 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 the surface soil, water supply, and drainage for a dwelling unit and/or the lot/land are considered. (7th Collegiate Webster, 1971)

STANDARD. 1) A rule or principle for correct behavior; a model or pattern for imitation; a rule 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. (Merriam-Webster, 1971)

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

TOILET. A fixture for defecation and urination, esp. for a dwelling unit. (7th Collegiate Webster, 1963)

TOXIC. Poisonous; injurious to health. (Merriam-Webster, 1971)

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

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

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

QUALITY OF INFORMATION
The quality of information given in the drawings have been qualified in the following manner:
Tentative: when based upon rough estimations of limited sources.
Approximate: when deducted from different and/or not completely reliable sources.
Accurate: when taken from reliable or actual sources.

METRIC SYSTEM EQUIVALENTS

LINEAR MEASURES
1 centimeter = 0.3937 inches
1 meter = 100 centimeters = 39.37 inches or 3.28 feet
1 kilometer = 1,000 meters = 3,280.83 feet or 0.62137 miles
1 inch = 2.54 centimeters
1 foot = 0.3048 meters
1 mile = 1.60935 kilometers

SQUARE MEASURES
1 square meter = 1.550 square inches or 10.7639 square feet
1 hectare = 10,000 sq meters = 2.4711 acres
1 square foot = 0.0929 square meters
1 acre = 0.4047

BIBLIOGRAPHY


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