ECONOMIC CHARACTERISTICS OF URBAN DWELLING ENVIRONMENTS IN MEXICO CITY

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ABSTRACT

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An important determining force in urban development is economic. Development takes place with people's willingness and ability to pay -in monetary and non monetary terms- for housing accommodations, thus stimulating market forces to meet their demands.

In developing economies however, a great percentage of population is marginal to economic development. The urban economy has been unable to expand and absorb the increasing surplus labor force. Nor has it been capable of subsidizing low income groups housing demand. Within this urban context, the low income population strive to fulfill their housing needs and in this attempt generate "inefficiencies" in the urban structure.

This thesis is concerned with the analysis and evaluation of selected urban dwelling environments in Metropolitan Mexico. It attempts to define low income housing economic performance regarding the financial and real estate markets; and to identify the quality of "inefficiencies" regarding urban development. The need for enlightened urban development policies is emphasized.

The study is based on empirical data and on a systematic analysis of the physical and economic characteristics of the present situation in low income housing.

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Since no comprehensive economic analysis on low income housing in developing countries has yet been available, the main objective of this study is to identify and define the basic economic components of low income urban dwelling environments. Dr. Philip David (Professor, MIT) guided me in establishing the criteria for this analysis. I am grateful to Dr. David for his valuable suggestions and observations on these findings.

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PREFACE

CONTENT:
This research describes the economic characteristics of the low income dwelling environments in Mexico City by analysing 12 case studies which are representative situations existing at the present time in the Metropolitan Area. The following are included in this analysis: an "introduction" on low income housing economic analysis and definition of housing systems; a description of Mexico City's "urban context"; twelve "case studies" stressing on the economic aspects of selected low income housing situations (three cases deal with Public housing); "dwelling and urban analysis" on the utilities and services, physical and economic characteristics of the cases presented; a "graphic evaluation" regarding their land utilization, density, dwelling value distribution, value per person and their physical/economical correlation; an "economic analysis" of case studies, evaluating their net income and returns, also expressed in graphical terms; and "concluding" observations about low income housing economic performance stressing on the need for an urban development policy. Each case consists of: DRAWINGS of locality segment and typical dwelling; DESCRIPTIVE DATA concerning the land values of the locality and block, and values concerning the dwelling's construction. The cases provide first hand material which identifies each housing system, particularly from the physical and economic standpoint.

PURPOSE:
This study attempts to identify, analyse and evaluate the economic performance of low income dwelling environments in Mexico City. The research provides a comparative analytic framework for low income housing, including Public housing, in base of their urban, physical, social and economic qualities. The material is intended to stimulate the formulation of an urban development policy regarding the existing low income housing systems.

APPLICATION:
This research provides a reference for the understanding of low income housing and it's urban environment. It offers a base for realistically approaching low income housing, by drawing on the information of existing housing and urban infrastructure. Their physical and economic analysis/evaluation provides an insight of urban development. It is meant to orient planners and decision makers about the key components/ characteristics of low income urban development.

DATA:
This study is derived from field research carried on during the Summers of 1973, 1974 and Winter of 1973; and from technical assistance of "Hipotecaria Bancomer S.A." property appraisers, who aided the author in appraising different housing situations. The technical information concerning land and construction values was also facilitated by HBSA. This study is based on a previous research on low income housing: "Urban Dwelling Environments in Mexico City" (Bazant J., Cortes J.L., Davila R., Espinosa E., U.S.D.P., MIT, 1974) which stressed the physical aspects of low income housing.

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INTRODUCTION

1. POPULATION:

Urban development starts with people who are willing to pay for housing accommodations...

There are two major types of variables which influence a population's willingness to pay and determine their movement and settlement within the urban context. The first is NON-ECONOMIC such as kinship and societal ties, expectations of employment, security of land tenure, and so forth. Non-economic determinants are based on each households's own evaluation of its needs. Potential movements within the Metropolitan Area are a consequence not only of these perceived needs, but also of the availability of information about the different dwelling environments which may satisfy these needs. Together, evaluation of needs and information shape the household's priorities for housing.

ECONOMIC variables appear as the population attempts to satisfy these priorities by trading off something in exchange--usually money. For example, one extreme case is when the population can afford to pay in monetary terms their basic priorities. But when money is not fully available, non-monetary economic means like labor, time, risk, and so on, will substitute partially or totally for the monetary value of priorities. This substitution is particularly significant at lower income levels, where monetary means are just complementary to non-monetary means. The other extreme case is a population's lack of monetary means which is substituted for by "risk" in invading property usually in the periphery, by extensive daily travel ("time") to activity centers, by "labor" in raising their shelters, etc. Squatter settlements, then, are an economic alternative to urban development. Property invasions, time, labor,...may also be quantifiable in monetary terms, and all have an impact

on the economic performance of the urban structure. Normally, low income population uses both the monetary and non-monetary economic means to fulfill their priorities.

Yet a further complication arises when the population has expectations and priorities that are vastly influenced, directly or indirectly, by economic factors. This marks the separation of economic and non-economic variables.

The population's willingness to pay for housing accommodations, be it in monetary or non-monetary terms, acts to stimulate the market forces to meet their demands. In a developing economy, however, the overwhelming majority of the population is marginal to economic development. Of the lower income groups, the majority are unemployed, self-employed, partially employed or even sub-employed. But in spite of the severe economic constraints, the lower income population does manage to perform within the urban economy using economic means. They relate to the urban economy through their competition for housing situations. They compete on an economic basis, through rents or housing expenditures. In spite of the common belief that the lowest income groups are not responsive to economic forces in the urban context, they do relate to the urban economy.

On the other hand, the more affluent population has a "direct" relation to the urban economy, mainly through employment. A stable economic situation will, at least, permit them some control over their mobility and the ability to achieve their priorities. As they have the possibility of increasing their expenditures in housing, they will obviously be competing with fewer people.

2. URBAN/DWELLING ANALYSIS:

2.1 PHYSICAL: Within this urban context, low income populations strive to fulfill their housing priorities. In such an attempt, they generate settlement patterns. These are defined as housing systems, and cover the range of low-income housing situations in Metropolitan Mexico. Case studies were selected for each housing system, on the basis of their representativeness.

In this study, these housing situations have been identified through urban, social and economic components of their dwelling environments. The urban component deals with the analysis of dwellings, their lots and service infrastructure quality. The social component deals with analysis of households, their composition and income levels. The analysis of the economic component deals with dwellings and land/lot values. By evaluating these components, it has been possible to define the characteristics of urban development, which is the result of an accelerated urbanization process and the precarious economic condition of the population. Rapid expansion has brought serious physical "inefficiencies" in the use and functioning of the urban structure. These basically relate to the housing situation's land utilization, its location, services, density and dwelling type. Physical "inefficiencies" have an undesirable economic repercussion on the urban market, principally in land or housing rentability.

2.2 ECONOMIC:

Market forces stimulate urban development. The physical "inefficiencies" of urban environments not only have an economic impact on housing, but in addition, they are a result of the fact that the economy is one of the governing factors in the Metropolitan Area. The low income population responds in economic terms to the housing market and stimulates the market by that response. The economy, then, is an important factor in the development of low income housing.

What are the economic characteristics of low income housing? The population's economic condition is the principal determinant of housing and urban development. It is they, through their willingness and ability to pay, who bid and determine real property value and who unknowingly define the economic (monetary) conditions under which their properties operate (rentability).

A population's housing expenditures indicate its ability to pay for housing. The housing expenditures, in terms of amortizations or rents, are payed for by property's use or value. These are taken as property's gross income or revenues--which is the monetary value at which properties are exchanged in the market (for rent or for ownership). To analyze property's monetary rentability it was necessary to estimate its net income or revenue. By subracting from the property's gross revenue, the stabilized operating expenses (maintenance, services, taxes, financing costs) which are incurred in the utilization the net revenue has obtained. In other words, net revenues are the final monetary value which properties yield according to the population's willingness and ability to pay.

But not until properties' net revenue, or rentability, are related to the urban economy, will it become clear how low income populations operate within their dwelling environments. Properties are subject to continuous change in value because they are affected by two factors principally: through demand, by means of which the population shapes the trends in housing and urban development; and through finance, by means of which the economy determines the exchange rate of money, which affects low income populations and their expenditures on housing. Both converge in the property's rentability.

This thesis analyzes these two basic components of the urban economy in regard to low income housing: a) the real estate component (land market principally) is produced by the population's willingness and ability to pay and by the urban structure's capacity to fulfill this demand. The analysis of this component basically focuses on the property's own capitalization or its value-added, or the rate at which properties are increasing in value due to demand-supply forces. The increase in value is taken as the real-property return, resulting from the population's economic (monetary and non-monetary) investment. b) the financing component (mortgage market principally), reflects the monetary returns on capital investment. The analysis focuses on housing opportunity returns, which are estimated by assuming that the property's values are invested in the mortgage market.

When the appraised property value and net revenue of different housing situations were analyzed comparatively with their corresponding values/returns obtained through the real estate and mortgage market, some patterns of their economic performance were identified. In general, it was found that low income housing operates with strong economic "imbalances" resulting from discrepancies between the value of properties and their returns. The economic "imbalances" are a consequence of the population's meager ability to pay (low net revenues for given property values); the property's return (high value-added rate due to demand-supply); and the prevailing opportunity returns (low mortgage rate return, high inflation rates).

This study deals then, with the analysis and evaluation of the physical and economic characteristics of low income housing. The low income dwelling environment's physical "inefficiencies" and economic "imbalances" should be regarded as a resultant stage of the population's socio-economic development. They are not permanent qualities, but rather dynamic characteristics of a rapidly developing environment. Although the value figures are constantly changing, what should remain, however, is the notion of urban development

performance.

It is therefore the population, which determines the value hierarchy of its urban dwelling environments, through its willingness and ability to pay. This economic force has in general shaped Metropolitan Mexico's development. Since low income housing systems have "emerged" in different times and under different circumstances, it is important to familiarize oneself with the basic Metropolitan Area's development patterns. The case studies and housing systems, should be viewed together and in perspective with this development.

3. HOUSING SYSTEMS:
Although throughout this study the "housing systems" will be approached and defined in different manners, the following description will initially serve to identify them.

The great majority of the population in Mexico City lives in distinct dwelling environments which are generally recognized by local vocabulary: the names ciudades perdidas, colonias proletarias, vecindades and conjuntos habitacionales, which, in the Metropolitan Area, denote more than a physical dwelling type. In addition to certain kinds of living environments, these names are associated with certain social classes, with certain locations or ranges of locations in the urban area, with certain interest groups, with specific forms of tenure, and with certain economic characteristics. In other words, these names describe more or less distinct "housing systems," typified by characteristic mixes of inhabitants, physical environments and locations, land and urban economics, sponsorship and/or origins of ownership and management. (Turner 1971:II-1)

3.1 CIUDADES PERDIDAS:
These are generally small, very densely populated, unplanned shantytowns scattered throughout the inner ring of the city. (case study: BUENOS AIRES) They occupy any vacant urban lot, typically in the core of blocks forming closed communities from which their name is derived: lost cities. The great majority of their inhabitants have very low incomes and they rent the land where they self-built their shacks. Many households are incomplete or composed of unrelated singles, and many, especially the incomplete families, are long-term residents without hope or expectations of improving their social, economic or physical conditions. A varying, but generally substantial minority, are transients with expectations of upward mobility. Approximately 2% (or 200,000 people) of the 1970 Metropolitan population live in ciudades perdidas. (Turner 1971:II-5) This proportion increased rapidly in the 1945-55 period when the downtown tenements gradually became saturated, and demand stimulated core owners to rent land, thus creating another housing alternative. Growth has decreased somewhat since 1955, but it is expected to increase slightly in the future. (Turner 1971:op.cit.)

3.2 COLONIAS PROLETARIAS or POPULARES NUEVAS:
Most of these are privately promoted subdivisions providing individual building lots on unserviced land on the periphery of the built-up area, generally on land of poor quality such as hillsides or old lake beds subject to seasonal flooding. (case studies: JALALPA, LOMAS DE SAN AGUSTIN, NETZAHUALCOYOTL) Increments of several thousand lots are common but generally there are no clear boundaries between contiguous subdivisions and little or no social organization that clearly subdivides the colonias into identifiable neighborhoods or communities.

Initially, densities are very low but gradually become more dense over a period of about 15 years. After similarly varying periods, utilities are often provided but unevenly and incrementally. (Harth

Deneke 1966:42) The great majority of dwellings are single-family structures of one and two floors, most of which are also built incrementally from a shack or a single room built of concrete blocks.

The population is young, and nuclear families predominate. The majority of the residents are at low income level and static in their socio-economic situation. Only a minority is upwardly mobile. (Turner 1973:202)

The colonias paracaidistas or squatter settlements are the only significant variation from the commercial and semi-legal speculative developments. The main differentiation is that squatters are internally organized and have a clearer physical and social identity. Income levels are lower, but the rate of investment is often similar to that of the other colonias, as they do not have to pay the costs of land. They are generally located on hillside land which may either be public, private, ejidal (communal land for agricultural use) or disputed property. After their settlement, the community has to struggle for public recognition (land tenure) and service supply.

The "new" colonias proletarias and squatter areas have been, for the last two decades, the reception pools of the Metropolitan Area's impressive demographic growth, especially for the low income population. Of the 1970 Metropolitan population, almost 27% (or 1.3 million persons) are considered to live in this housing system. (Turner 1973:11) This system increased rapidly since the late 1950's and consolidated its growth tendencies during the last decade. Its expansion will likely remain the same during the present decade.

3.3 COLONIAS PROLETARIAS or POPULARES VIEJAS:
Some are privately promoted subdivisions, yet the majority are unplanned subdivisions resulting from the urban sprawl. Both were gradually developed from the 1930's to the 1950's at the urban periphery. (case studies: PRO-HOGAR, VALLEJO) The city's expansion has absorbed them into consolidated intermediate zones. These areas have typically mixed land used with proportions of small industrial and commercial activities. Although public utilities may be deficient, most properties have the standard connections, most streets have sidewalks, are paved, have storm drainage and sewerage, lighting, etc.

Residential densities are generally medium, in spite of the mixed land uses. The density of the built up area is compact. The majority of dwellings are single family structures of one or two stories: nonetheless, there is a high proportion of walk-up apartment buildings. Most dwellings have been completed up to and including the construction finished and normally have adequate service supply.

Since the population has been settled for several decades, old nuclear families predominate. Most households have already reached a stable economic situation in the moderate-low income level.

It is estimated that of the 1970 Metropolitan population, almost 12% (or 1.0 million persons) live in old colonias. (Turner 1973:201) In spite of the colonias' area constraint, they may still densify in the future, although it is likely that the rate of growth will decline.

3.4 VECINDADES:
These are one or two story courtyard tenements built before 1940, located in central and inner city areas. Most are composed of between 20 and 50 one and two room dwelling units, and almost all are provided with communal toilets and laundry facilities. (case studies: LAS VIZCAINAS, CASA GRANDE, LA FLORIDA) At dif-

ferent times during the past 30 years, rent controls have been imposed on the vecindades. These controls have led to extraordinary differences between the rents paid by long term residents and newcomers--differences of 1000% or even 2000% for similar and even adjoining units are evidently common. (Turner 1971: II-6)

The incomes of the tenement population vary widely from low to moderate-low incomes. These correlate with length of residence and the forms of tenure, which introduce significant variations:
1) controlled rent tenements are generally occupied by long term, higher income residents who are tied into a local kinship network which of course controls the distribution of units;
2) the uncontrolled rent tenements (formed by free market units) are conversely occupied by families with lower incomes, with shorter periods of residence and who therefore have fewer kinship ties and are more transient. Though poorer, many of these families are younger and have expectations of reaching equal or higher socio-economic levels. There are also substantial numbers of households who have little or no hope of improving their conditions.
3) the newer and often clandestine tenements located in the old and new colonias proletarias may form another variant. Though increasingly important, this variant is included in the free market uncontrolled rent tenement. Little information is available on this variation.

Approximately two million persons or 23% of the 1970 Metropolitan population lives in vecindades. (Turner 1971:II-5) Due to their low rents and proximity to employment sources, the downtown tenements, once the major reception center for migrants, soon became saturated. No growth has been registered in the past decade, and its static condition will likely remain in the future. (Turner 1973:39)

3.5 CONJUNTOS or UNIDADES HABITACIONALES:
These are publicly owned and built housing projects. With few exceptions, these are located in the outer residential ring of the Metropolitan Area. Most are multi-family apartment blocks and row houses, and the physical standards of the dwelling units and related facilities are often very high. (case studies: SAN JUAN DE ARAGON, IZTACALCO, NONOALCO-TLATELOLCO)

Apartments normally have 2-3 bedrooms, which accommodate comparatively smaller nuclear families. Since dwelling units are usually offered to unionized workers or employees, there is apparently no homogeneousness regarding the household's age and composition.

Population densities range from medium to high. The majority of the residents have a stable socio-economic position, with upwardly mobile tendencies.

The high level of public subsidy provided reduces the rents to levels which most upper/lower income families can afford. Though many actual occupants have middle income levels, the conjuntos do provide a low income housing alternative for a very limited number.

It is estimated that only 500,000 people or 6% of the 1970 Metropolitan population lives in Public housing. (Turner 1973:240) If the Metropolitan population increases as it did during the past decade, in spite of the expected housing programs output increase during the present decade, it is likely that their impact on population will decrease proportionately.

These systems are typical of existing housing situations in Metropolitan Mexico. They represent the living/dwelling environments of nearly 70%, or 6 million persons, of the 8.6 million Metropolitan population in 1970. (Turner 1973:11)

I. URBAN CONTEXT

1. PRIMARY INFORMATION:

Mexico City is on a high plateau, limited on the north by the Sierra de Guadalupe, to the south by the Sierra del Ajusco, to the east by the partially dry Texcoco Lake and to the west by the Sierra de las Cruces; latitude 19°3' north, longitude 99°22'west. Although located at an altitude corresponding to a tropical climate, the city is 2242 meters above sea level, thus the area has moderate summer and winter temperatures ranging between 5°C and 26°C, heavy precipitation during May to October with montly averages ranging between 55mm to 148mm, often accompanied by electric storms.

2. POPULATION MOBILITY AND LOCATION:

Traditional patterns of low income mobility have been defined as follows: rural migrants arrived directly to downtown areas looking for employment and a place to settle. (Turner 1967, 1968a, 1968b, Brown 1972) Eventually, as income increased, the expectations for housing security rose stimulating migrants to move to the periphery where unexpensive lots were available for building their own shelter. (colonias proletarias) This mobility pattern has been changing from decade to decade. The downtown tenements soon became saturated, then oversaturated, until demand encouraged downtown land owners to "open" vacant lots as housing alternatives. Thus, ciudades perdidas were implemented. Last decade intense migration currents no longer were absorbed by central accommodations. Low income housing demand then shifted to the periphery. Actual migration and internal mobility trends are therefore concentrated in peripheral colonias.

The centrally located vecindades are today saturated. It was found that they have remained static in growth during the past decade. The ciudades perdidas, although a proportionally small housing system, have been increasing its population at 3.5% annually. (Turner 1973:39)

T.1: METROPOLITAN MEXICO: HYPOTHETICAL POPULATION DISTRIBUTION IN 1970.

	POPULATION (MILLIONS)			
	CENTER	INNER	PERIPHERY	TOTAL
CIUDADES PERDIDAS	0.10	0.10	---	0.20
COLONIAS NUEVAS	-	-	2.30	2.30
COLONIAS VIEJAS	-	1.00	-	1.00
VECINDADES	0.90	1.00	0.10	2.00
CONJUNTOS	-	0.30	0.20	0.50
TOTAL	1.00	2.40	2.60	6.00
(%) OF POPULATION	11.60	27.90	30.20	69.70

SOURCE: TURNER J.F.C.,"NOTES FOR A HOUSING POLICY WITH SPECIAL REFERENCE TO LOW INCOME HOUSING SYSTEMS IN METROPOLITAN MEXICO",MEXICO-CAMBRIDGE, INSTITUTO AURIS, 1971, CHART B. BROWN J.C.,"PATTERNS OF INTRA-URBAN SETTLEMENT IN MEXICO CITY. AN EXAMINATION OF THE TURNER THEORY",CORNELL UNIV., PP. 11-26.

The colonias proletarias viejas are compact residential zones, who expanded their population with 5% annual increase rate. (Turner 1973: op. cit.)

Since last decade, low income housing demand concentrated in the periphery where large extensions of raw land were transformed into colonias proletarias. Their expansion had a 15% p. a. increase rate. (Turner 1973:201)

Finally, Public housing increased at 3.5% annually. (Turner 1973:39)

3. HISTORIC DEVELOPMENT:

The city was originally settled on an island in the Texcoco lake. The 270 ha. island had connections with shore villages through the Calzada de Tlalpan to the south, the Calzada Tacuba to the west and Calzada de los Misterios to the north. Also the Calzadas Vallejo and Nonoalco served later as connecting roads. These main roads also served as dikes intended to regulate the lake's water level, as to avoid the island flooding and to secure the acquatic circulation in the lake.

These roads served ever since as the principal axis of communication and development of the city, especially when the lake was drained and the island became "incorporated" as mainland.

During the entire Spanish colonial period (1520-1810) the small growth of the city remained principally concentrated around its center.

In the late 1800's and at the turn of the century, all towns surrounding the city started growing (Atzcapozalco, Tacubaya, Mixcoac, San Angel, Coyoacan) when people began building residential estates for seasonal use. In this period, other primary arteries were defined, mainly: Reforma, Revolucion, Chapultepec and Insurgentes; all of which consolidated important development axes in the decades to come.

Since 1910, the population began moving out of the city center, and started forming "residential" areas nearby. The center was gradually left for low income population, yet it continued preserving the main commercial and administrative activities.

When industrialization began in the 1930's and intensified in the following dedades, the city sprawled following basically the direction of roads. Some roads were taken as axes for industrial development (Vallejo, Misterios, Insurgentes Norte, Tacuba); and others were for residential and commercial development (Reforma, Chapultepec, Insurgentes Sur, Revolucion, Tlalpan). The low income population began establishing itself near industrial areas, while higher income groups did so near commercial areas.

The main urban arteries had been extended to connect with roads that linked Mexico City with other cities. Insurgentes would be the typical case, as it crosses the Metropolitan Area, and gives access in the north to the city of Pachuca and in the south to Cuernavaca. Other roads met with the extension of avenues, like Roforma which lead to Toluca city, Tacuba which lead to Queretaro, and Zaragoza which leads to Puebla.

In the 1940's growth was mainly concentrated along these grand avenues.

In the 1950's, the urban growth dispersed into filling vacant areas between avenues, instead of continuing expanding along the circulation axis. Up to this decade all urban development took place within the Federal District (DF) and only a small proportion in the neighboring State of Mexico (SM), which was during that time principally attracting industrial expansion.

At the turn of the 1960's, 94% of the Metropolitan population lived in DF and 6% in SM. (Unikel 1971:512) The 1960's is characterized by its massive expansion, principally in the State of Mexico. This was partly a result of local development policies: the DF blocked land subdivisions while EM permitted them. By 1970, of 8.634 m. Metropolitan population, 21% already lived in SM. (OPR 1973:C15) Actual massive growth is the result of intense migration currents which are absorbed by SM who has low cost land, while DF population tends to remain mainly at a "natural" growth rate.

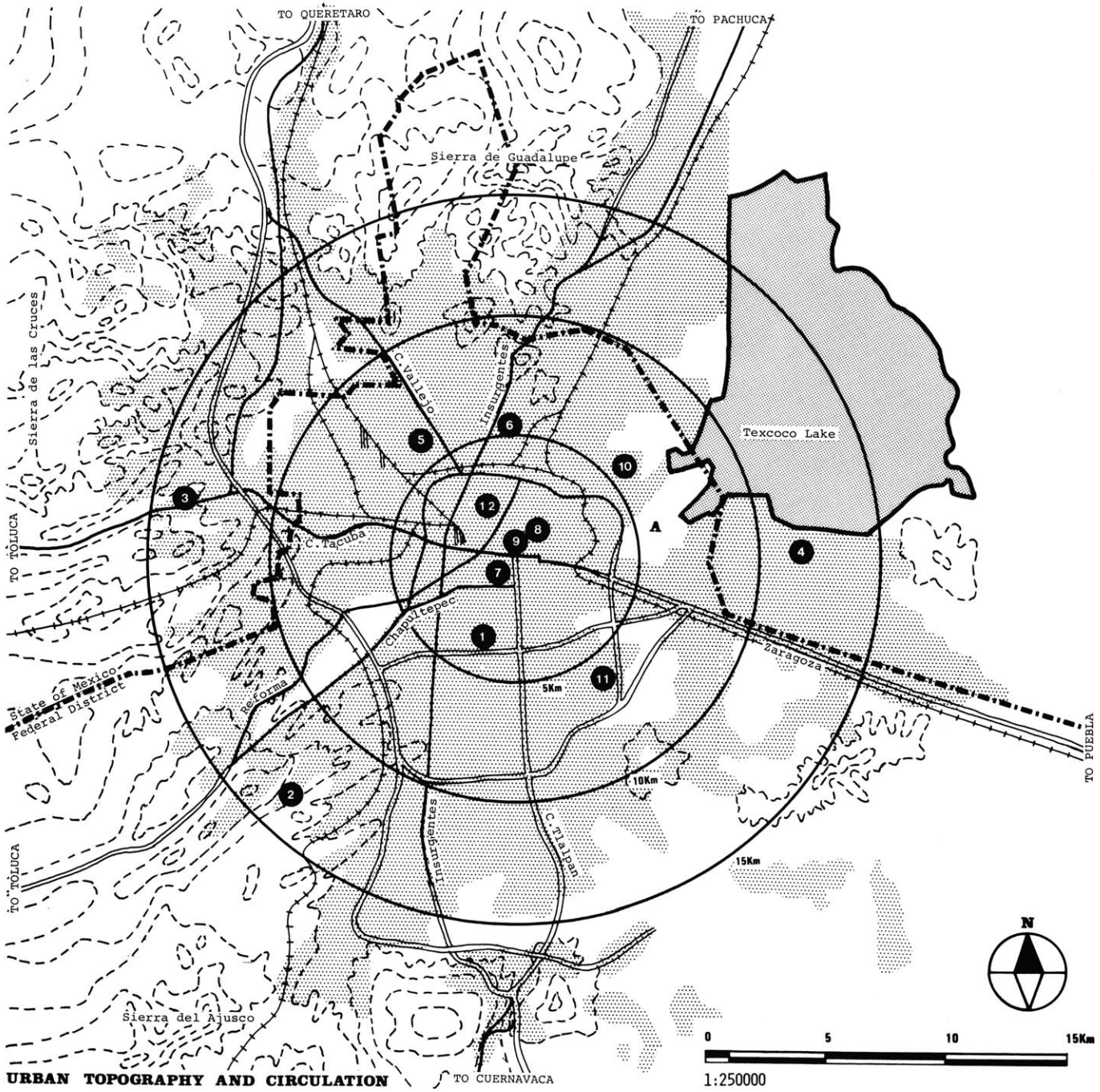
Metropolitan growth has been impressive. Since the turn of the century, approximately every 20 years population and area have been doubling.

T.2: METROPOLITAN MEXICO: POPULATION GROWTH AND EXPANSION.

YEAR	TOTAL		FEDERAL DISTRICT		STATE OF MEXICO	
	POP (MILL.)	AREA (KM2.)	POP (MILL.)	AREA (KM2.)	POP (MILL.)	AREA (KM2.)
1900	541,000	27.137	541,000	27.137		
1910	721,000	40.100	721,000	40.100		
1921	906,000	46.375	906,000	46.375		
1930	1,229,600	86.087	1,229,600	86.087		
1940	1,757,500	117.537	1,757,500	117.537		
1950	3,480,000	240.587	3,480,000	240.587		
1960	5,086,900	342.750	4,870,900	333.000	216,000	9.750
1970	8,634,000	526.500	6,874,200	413.000	1,760,000	113.500

SOURCE: OFICINA DEL PLANO REGULADOR,"EL DESAFIO DEL DESARROLLO METROPOLITANO Y LA ORGANIZACION MUNICIPAL. AREA METROPOLITANA DE CIUDAD DE MEXICO", PONENCIA, 1973, C-1 TO C-15. SORDO J.R.,"EL SISTEMA DE VALORES DE LA TIERRA Y LA ORGANIZACION DEL ESPACIO URBANO EN LA CIUDAD DE MEXICO", INSTITUTO DE INGENIERIA,UNAM, 1974, P. 10-16.

It is interesting to observe where the selected case studies are located. The ciudad perdida (case 1) is located within an area that was developed in the 1930's, and now forms part of central ring: while the colonias proletarias nuevas (cases 2, 3, and 4) are located in peripheral areas which have been developed during the last decade but are still expanding.



URBAN TOPOGRAPHY AND CIRCULATION

1. BUENOS AIRES
2. JALALPA
3. LOMAS DE SAN AGUSTIN
4. NETZAHUALCOJOTL
5. PRO-HOGAR
6. VALLEJO
7. LAS VIZCAINAS
8. TEPITO - CASA GRANDE
9. TEPITO - LA FLORIDA
10. SAN JUAN DE ARAGON
11. IZTACALCO
12. NONOALCO - TLALTELOLCO

KEY

- A — Airport
- Primary Road
- Railroad
- Rapid Transit
- Built-up Area

The colonias proletarias viejas (cases 5, 6) were developed during the 1930's and 1940's urban periphery, but have completely been absorbed by later developments and form today the intermediate ring.

The vecindades (cases 7, 8, 9) are located in downtown areas, most of which were developed in the early 1900's.

Finally, the Public housing (cases 10, 11, 12) are located anywhere in the Metropolitan Area. Some form part of the downtown areas, while others are located in the intermediate ring or periphery.

4. INCOMES:

Metropolitan growth has increasingly been stimulated by low income groups, who by 1970 represented 65% of its population and at least 40% of its area. (Brown 1972:74)

In the city's pre-industrial growth, low income population concentrated in the proximity of downtown areas, where main commercial and administrative activities were centralized. (cases 1, 7, 8, 9)

When the industrialization process started in the 1930's and 1940's, low income groups began settling near industries, principally stimulated by land availability and proximity to working sources. (cases 5, 6)

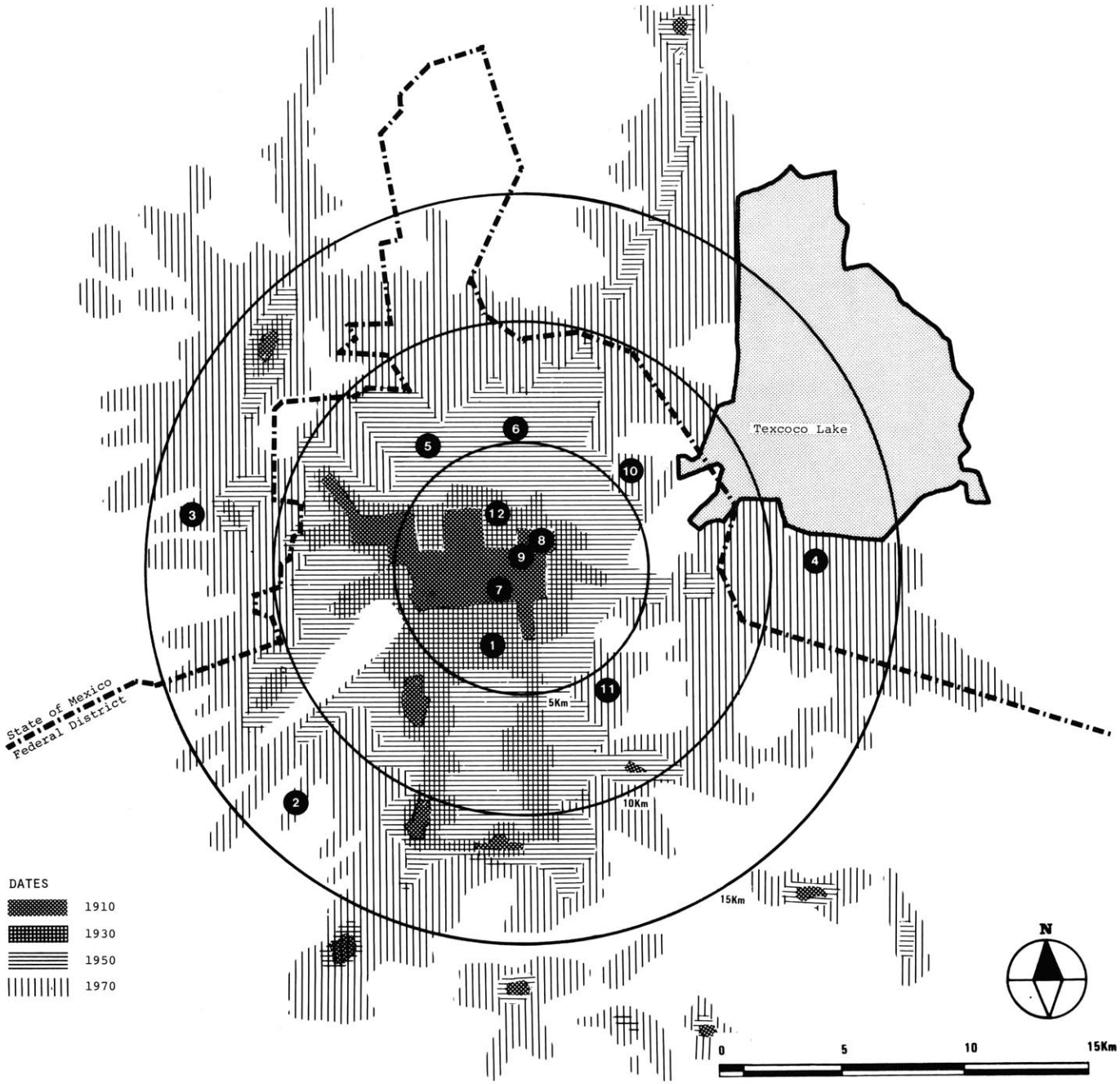
Finally in last decade, low income population have established principally in the periphery where land is available at low cost. (cases 2, 3, 4)

The income structure of Metropolitan population is as follows:

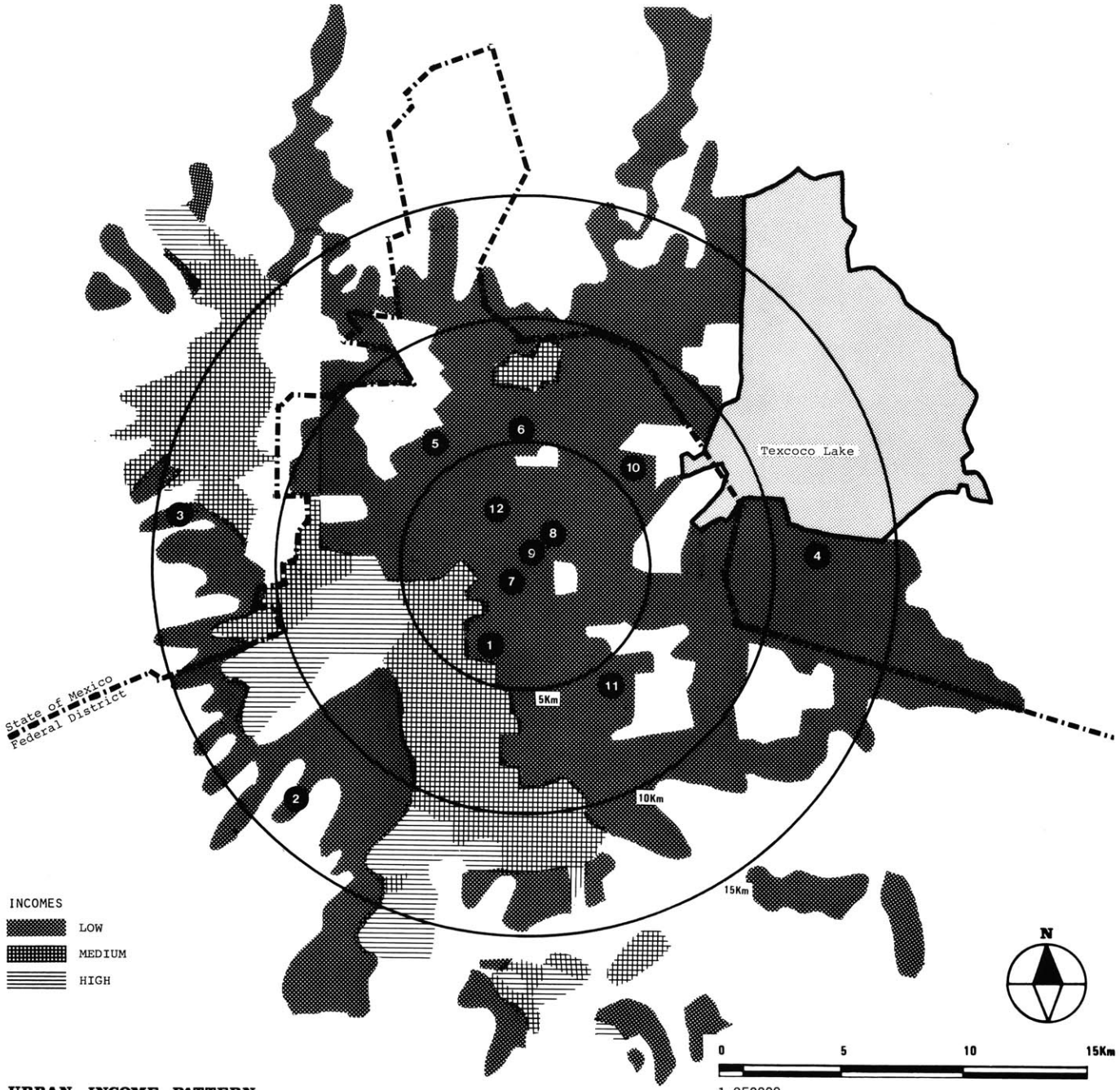
T. 3: METROPOLITAN MEXICO: INCOME DISTRIBUTION IN 1970.

LEVELS INCOME	SUBSISTENCE	ANNUAL INCOME ($)	POPULATION (MILLIONS)	(%)
LOW	- 8 S	- 3456	5.500	63.70
MIDDLE	8 S - 22 S	3456 - 9600	2.960	34.30
HIGH	22 S - ABOVE	9600 - +	0.174	2.00
TOTAL			8.634	100.00

SOURCE: DERIVED FROM TABLE 14.
NOTE: THE SUBSISTENCE LEVEL (S) IS DEFINED AS THE MINIMUM INCOME WITH WHICH AN AVERAGE HOUSEHOLD CAN LIVE IN METROPOLITAN MEXICO, COVERING IT'S BASIC NEEDS OF FOOD AND HOUSING. THE SUBSISTENCE LEVEL IS DEFINED AT $36 A MONTH AT 1970-71 PRICES. (TURNER 1973:3) THE LEVEL "S" IS USED AS AN INCOME UNIT, FROM WHICH ALL INCOMES ARE STRUCTURED. THIS STUDY IS CONCERNED WITH POPULATION WITH ANNUAL INCOMES LESS THAN $3456.



URBAN GROWTH PATTERN



URBAN INCOME PATTERN

The very low income groups living in cuidades perdidas concentrate in downtown since their priorities are proximity to employment sources' services, and peers; whereas the priority of population living in colonias is security of land tenure.

The moderate low income population of old colonias have already been established for over 25 years. They are conveniently settled, having proximity to working sources and land ownership.

The low to moderate-low income groups living in vecindades obtain proximity to activity center and peers, only through rental accommodations.

The population living in Public housing consists of upper-low to middle income groups, who are economically solvent.

5. LAND USE PATTERNS:
Its circulation axes are the Metropolitan Area's most important elements which determined its expansion and land use.

Along them are found "linear" commercial centers. Downtown continues to have the city's major wholesale activities. Two decades ago however, commerce began shifting to periphery, thus forming large commercial sub-centers.

Up to the 1930's, industries had been establishing in that time northern and western periphery, but soon found constraints for expansion as the city grew around them in the following decades.

Since the mid 1940's, industries have been attracted by State of Mexico's tax exemption policy. Most industrial expansion has been gradually absorbed by the neighboring State. But not until last decade, the residential expansion has started again to constrain industrial expansion.

Residential growth has been mostly stimulated by circulation network and industrial development, which also determined the income levels in housing developments.

The ciudad perdida (case 1) is located in a residential area with heavy concentration of commercial activities along main streets.

The colonias proletarias nuevas (cases 2, 3, 4) are located in periphery away from commercial areas and in most cases also away from industrial areas.

The colonias proletarias viejas (cases 5, 6) consolidate an intermediate belt of residential areas. They are located near main circulation arteries and commercial centers, and in some cases near industrial developments.

Vecindades (cases 7, 8, 9) form the predominant housing situation of downtown areas, where commercial activities and light manufacturing industries are abundant.

Public housing (cases 10, 11, 12) is located in residential areas, with no particular relation with commercial or industrial areas. In most cases Public housing is located near main arteries or even these are sometimes constructed to give an access to projects.

The circulation network along with its linear commercial centers integrate the Metropolitan Area's basic urban structure.

An estimate of the predominant land use areas is as follows:

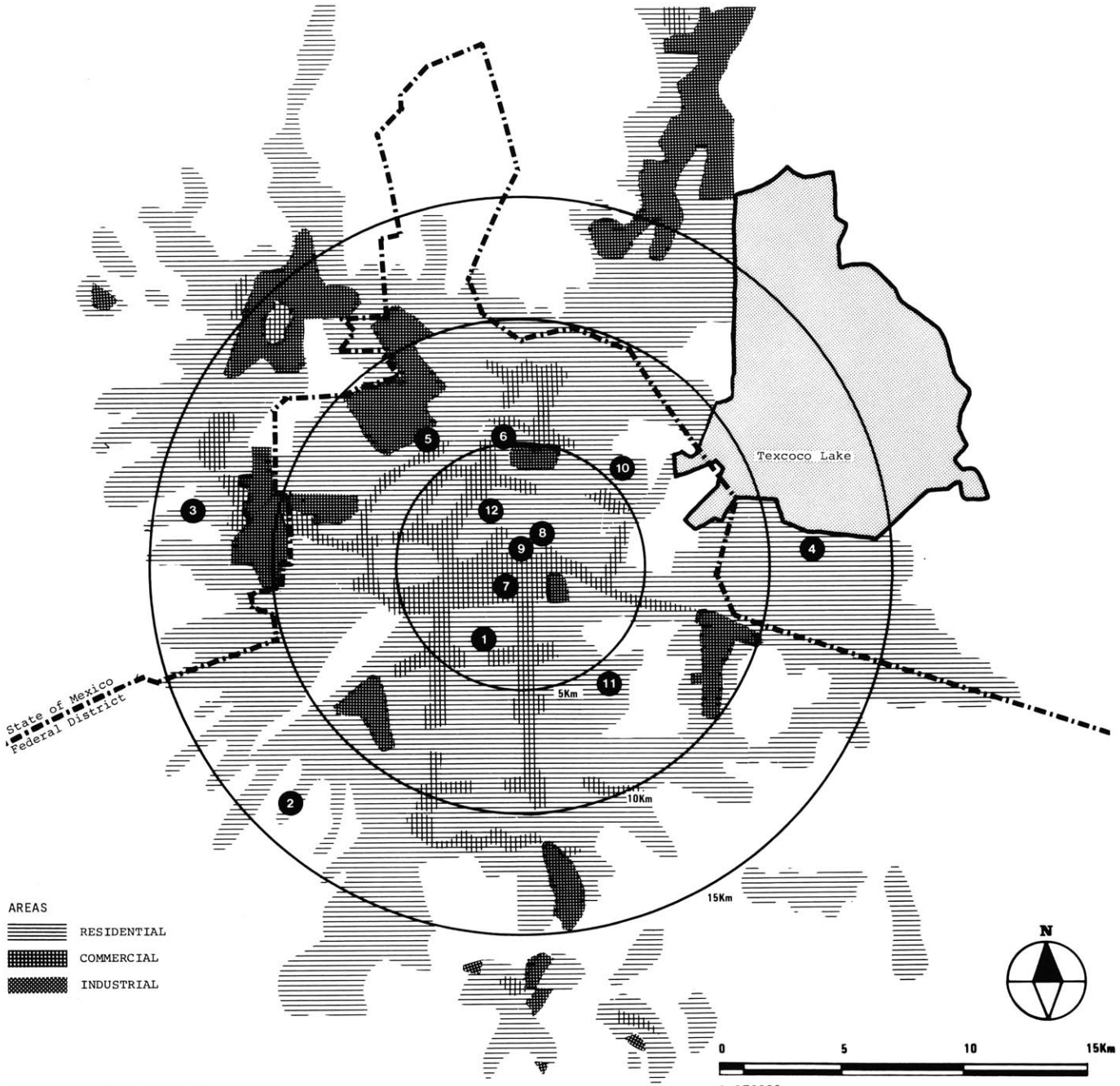
T. 4: METROPOLITAN MEXICO: LAND USE PATTERNS IN 1970.

	GROSS AREAS (Hs)	(%)
RESIDENTIAL	448.0	80.0
COMMERCIAL	31.1	5.6
INDUSTRIAL	63.6	11.4
OTHERS *	17.3	3.1
TOTAL	560.0	100.0

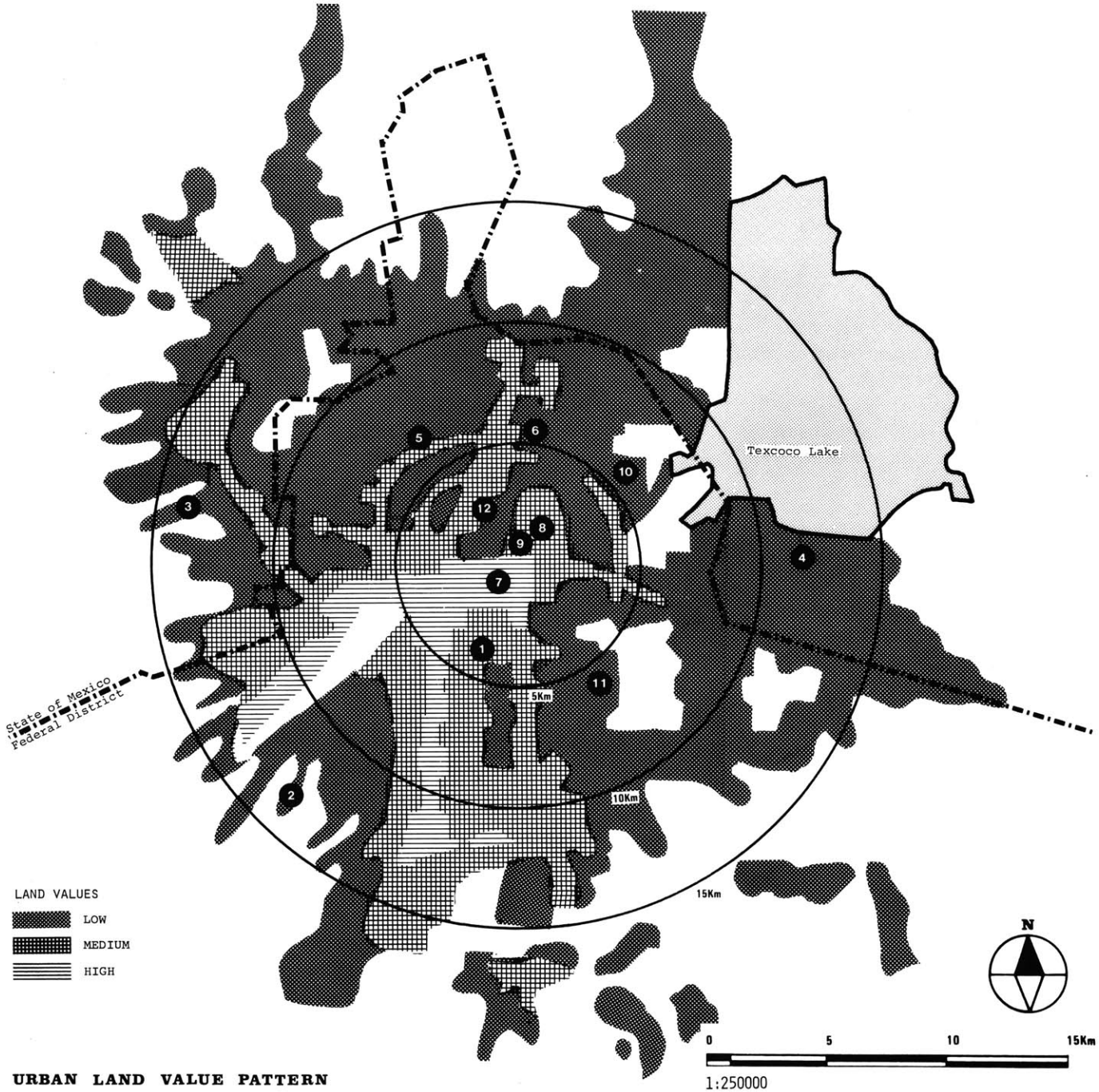
(*) INCLUDES RECREATIONAL AREAS, PARKS AND AIRPORT.
SOURCE: QUANTIFIED FROM: BURO DE INVESTIGACION DE MERCADOS S.A., "PLANO METCADOLOGICO DEL AREA METROPOLITANA DE CIUDAD DE MEXICO", MEXICO D.F., 1972. INSTITUTO AURIS, "ESTUDIO PRELIMINAR DE TEOTIHUACAN, TEXCOCO Y CHALCO. REVISION HISTORICA DEL CRECIMIENTO DE LA ZONA NOROESTE DEL AREA METROPOLITANA", NAUCALPAN EDO. MEXICO, 1973, P. 25,26.

Notice that only 3% of area remains open for recreational or other uses (airport, etc.). This proportion is very low considering that 80% of area is used for residential pruposes.

Circulation areas represent approximately 30% of residential areas, 25% of commercial areas and 20% of industrial areas. The recreational land uses are net areas. In other words, the circulation areas count for 27.7% of Mexico City's area.



URBAN LAND USE PATTERN



URBAN LAND VALUE PATTERN

6. LAND VALUES:

Land values result from Metropolitan Area's development process. They are mainly related to its land use, population's income and the physical service characteristics of the urban layout.

T.5: METROPOLITAN MEXICO: LAND VALUE RANGES IN 1970.

	RANGES	
	LAND VALUE ($)	SUBSISTENCE (S)
LOW	- 36	- S
MEDIUM	36 - 108	S - 3S
HIGH	108 - +	3S - +

SOURCE: HIPOTECARIA BANCOMER S.A.,"ALBUM DE VALORES DE LA PROPIEDAD", MEXICO DF, 1974. DIRECCION DE CATASTRO E IMPUESTO PREDIAL DDF, "ALBUM DE VALORES UNITARIOS PARA LA TIERRA EN LA CIUDAD DE MEXICO Y ZONAS URBANAS DEL DF", TESORERIA DEL DF,MEXICO DF, 1970.
NOTE: THE SUBSISTENCE INCOME "S" IS TAKEN AS A UNIT TO ESTABLISH LAND VALUE RANGES.

The ciudades perdidas (case 1) are located in central areas where land values are at medium level. These income groups afford expensive locations by reducing their dwellings' living space.

New colonias proletarias (cases 2, 3, 4) are developed where land values are the lowest. This is the reason for their rapid expansion. Land values tend to increase due to the intense demand.

Old colonias proletarias (cases 5, 6) are located in areas of medium land values, since they are near commercial and industrial zones. Their values tend to increase at slower rates.

The vecindades (cases 7, 8, 9) have middle land values, which respond to their central location. Values tend to remain stable due to the saturation of housing accommodations.

The Public housing can either be found in zones with low land values in the periphery or medium values in the intermediate ring. (cases 11, 12)

Low land values are found as well in the industrial zones, most of which are located north of the Metropolitan Area.

High land values are predominant in central areas, in linear commercial centers and in high income residential zones.

Medium land values are also related to income level. Their residential zones are formed by single family housing, most of which are located south and west of the Metropolitan Area.

II. CASE STUDIES

The following case studies depict the land values and construction costs of selected urban/dwelling environments in Mexico City.

The 12 case studies presented were selected according to income groups and to their representative housing situation. Each case study contains the following information.

LOCALITY SEGMENT: Since all localities differ in size and shape, a segment of the same dimension has been taken from each locality for the purpose of comparison. The size of the segment is 400mx400m. The segment presented has been drawn after an aerial photograph and has been complemented with information provided by the Cadastre Office of the Federal District and State of Mexico. The segment contains the cadastre and commercial land values of each locality. A general description is made about the locality's land values. (refer to section 3.3)

BLOCK: Within each locality segment a typical residential block has been selected to analyse its land utilization and establish comparison between localities. The block is indicated in the locality segment. A description and figures are given about the typical residential lot dimensions.

DWELLING UNIT: A typical self-contained unit for an individual, a family or a group in each locality segment. A plan of the typical dwelling is included and a description concerning its area and family size, as well as it's constructive characteristics and costs. (refer to section 3.3)

DIAGRAMS: They express graphically the locality's typical dwelling, it's value composition and it's value per capita.

CASE STUDIES SURVEYED:

CIUDADES PERDIDAS (SHANTYTOWNS):

1. BUENOS AIRES: Popular, Very Low Income, Shanties.

COLONIAS PROLETARIAS NUEVAS (UNSERVICED, RECENT SPECULATIVE DEVELOPMENTS):

2. JALALPA: Private, Low Income, Row Houses.
3. LOMAS DE SAN AGUSTIN: Private/Popular, Low Income, Row Houses.
4. NETZAHUALCOYOTL: Private, Low Income, Row Houses.

COLONIAS PROLETARIAS VIEJAS (CONSOLIDATED, OLD SPECULATIVE DEVELOPMENTS):

5. PRO-HOGAR: Private, Low/Moderately Low Income, Row Houses.
6. VALLEJO: Private, Low/Moderately Low Income, Walk-up Apartments.

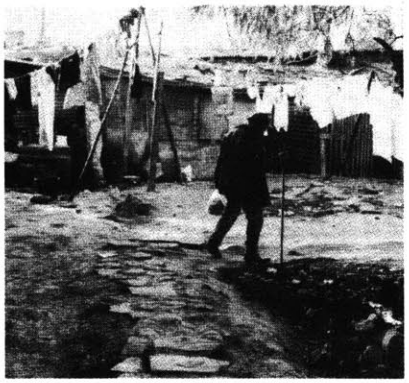
VECINDADES (TENEMENTS):

7. LAS VIZCAINAS: Private, Low Income, Row Rooms.
8. TEPITO - CASA GRANDE: Private, Low Income, Apartments.
9. TEPITO - LA FLORIDA: Private, Low Income, Apartments.

CONJUNTOS HABITACIONALES (PUBLIC HOUSING):

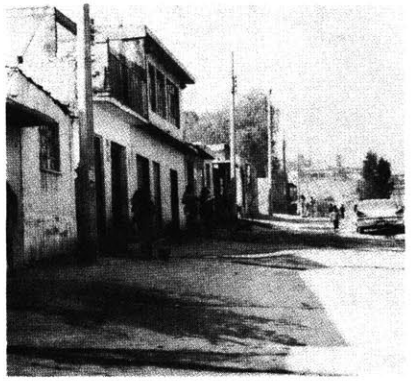
10. SAN JUAN DE ARAGON: Public, Mod.Low/ Middle Income, Row Houses.
11. IZTACALCO: Public, Mod.Low/Middle Income, Walk-up Apartments.
12. NONOALCO-TLALTELOLCO: Public, Mod.Low/ Middle Income, High-rise Apartments.

1 BUENOS AIRES



2 JALALPA

3 LOMAS DE SAN AGUSTIN



4 NETZAHUALCOYOTL

5 PRO-HOGAR

6 VALLEJO

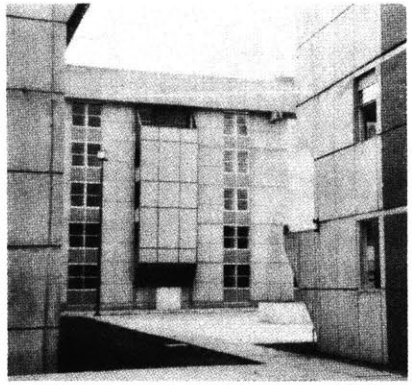
7 LAS VIZCAINAS

8 TEPITO

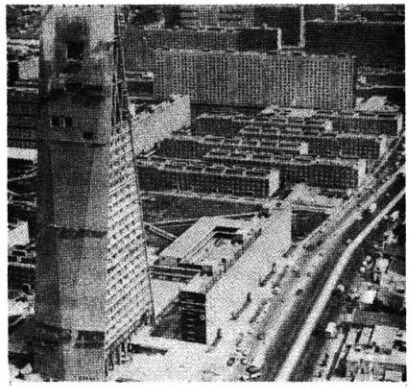
9 TEPITO

10 SAN JUAN DE ARAGON

11 IZTACALCO



12 NONOALCO



1 BUENOS AIRES

POPULAR, VERY LOW, SHANTIES

LAND VALUES:
The BUENOS AIRES case (named after the zone where it is located) is situated within the central ring. This zone's layout is formed by extensions of downtown main north-south axes (Dr. Vertiz, Nino Perdido) which intersect with diagonal east-west streets. This pattern gives a wide variety of blocks' shapes and dimensions, with a consequent heterogeneity of lot sizes.

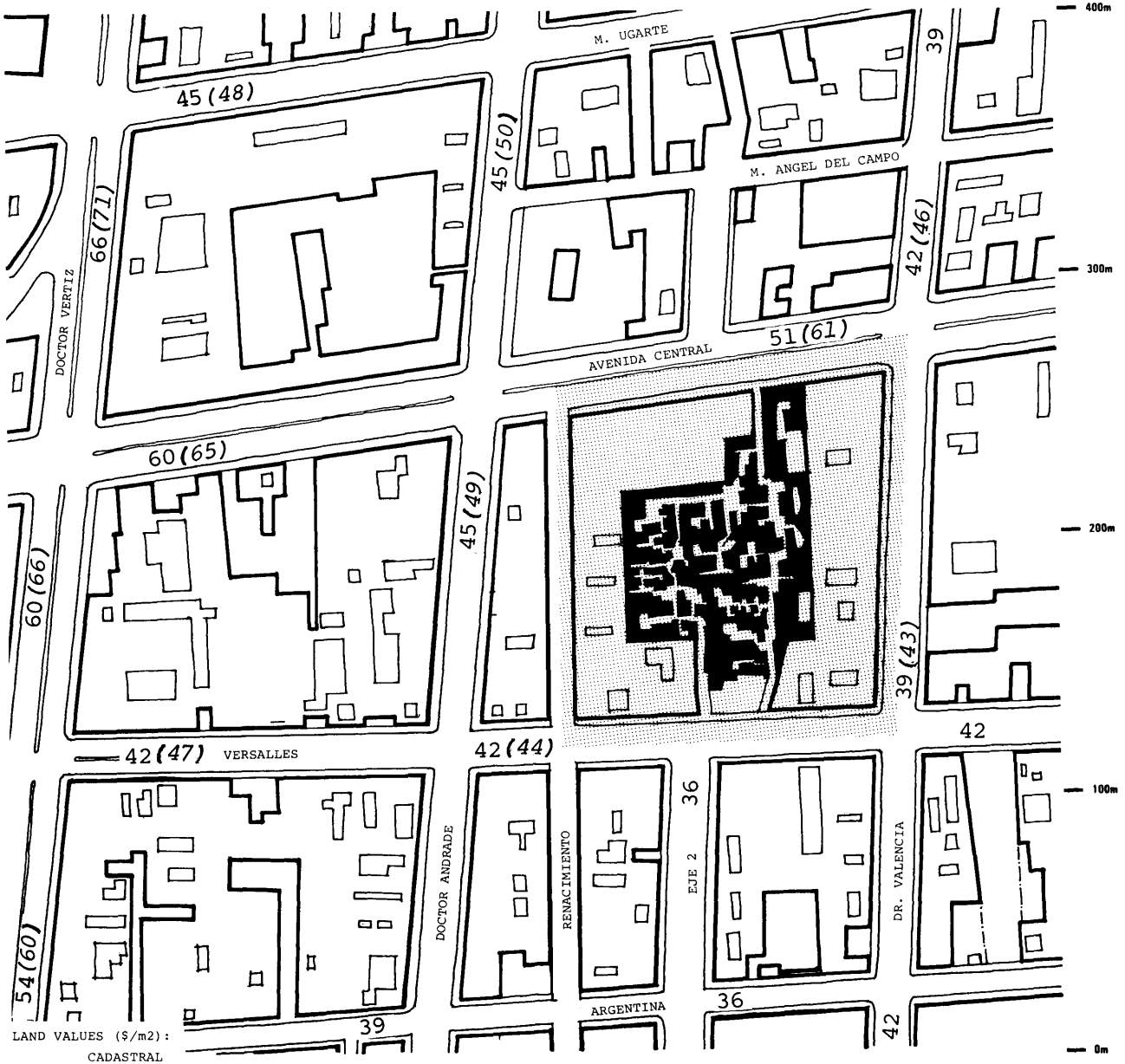
The selected block has a gross area of 1.750 ha. The ciudad perdida occupies the core of the block and has an area of 0.630 ha., or 36% of total area. (TDF 1959) It's estimated population is 1150 persons.

Land values in the segment are uniform. Value differences depend mostly on block's location and on lot's size and position within the block.

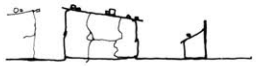
The cadastre values present the following ranges: lowest values ($36-$40) belong to inner blocks, while higher values ($48-$68) reflect proximity to principal streets. (DCIP 1970)

Market values respond similarly to blocks' location. The lowest values belong to interior blocks ($40-$48) while the highest values are those of lots facing main circulation arteries ($56-$72). The ciudad perdida interior lot, has a land value that has been appraised at $38/m2. (HB 1974) This is low for the segment, but it is explicable due to the lot's lack of accessibility, its inadequate service supply and its particular shape and dimensions.

On interior lots, there is not a significant difference between cadaster and commercial values. It is found in average, that they are within the same value range.

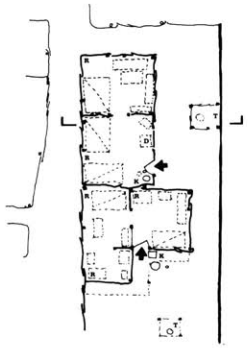


LOCALITY SEGMENT PLAN



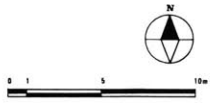
Elevation

Section



Plan

TYPICAL DWELLING



CONSTRUCTION VALUES:
This locality developed in the 1930's and is predominantly formed by low income 2-3 story walk-up apartments and single family houses. The residential land use is mixed with commercial and industrial activities, as shown in the segment plan.

This ciudad perdida was established in the mid 1940's. Some of its shelters are of course that old, and others have established recently. The reason why shanties last so long in spite of their ruinous materials, is that they have a capacity of accepting replacements when needed.

The community of BUENOS AIRES has 189 households. An average shanty covers an area ranging from 20 to 30 m2. The shelter studied covers a net area of 28 m2, and has a gross area of 33 m2 that includes its attributed area of interior semi-private walkways.

Shanties normally have two small "rooms," one of which is permanently used for sleeping and the other is actually used for any family activity, including sleeping.

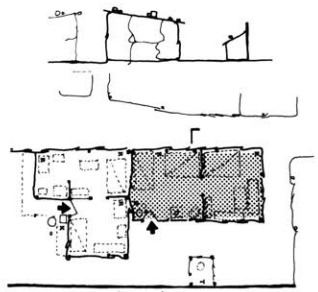
Ciudades perdidas have an average of 6, 8, and sometimes 10 members per household. This means that the covered area per person ranges from 3 to 4 m2. Because of space limitation, all the members use the walkways as extension of the dwelling and only crowd into shanty to sleep.

No cadastre values are attributed to these type of constructions, since they are raised with temporal materials and are "extra-legal" and therefore not subject to taxation.

The commercial value of a shanty is zero, since the materials utilized are extremely deteriorated. However, in other circumstances values may be attributed in base of their rentability.

BUENOS AIRES, Mexico City: (left) This photograph gives a view of the ciudad perdida's entrance. Notice how it is engoulfed by 2, 3 stories buildings, which can be seen in the background; circulation is entirely pedestrian, though pathways could be greatly improved. Electricity is tapped illegally and shacks are in poor physical condition. (E.Espinosa, 1973)

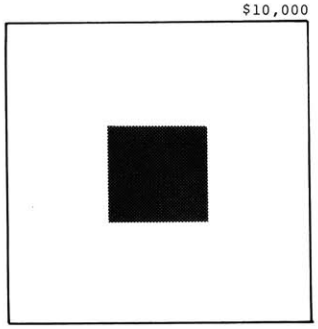
DWELLING UNIT VALUE DIAGRAMS



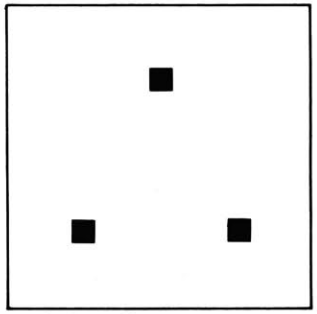
DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Value:	Land	1170
	Construction	--
	Total	1170

$10,000



VALUE PERCENTAGES: Land 100.0
Construction -



VALUE INTENSITY: $/Person 147
50 Dollars

2 JALALPA

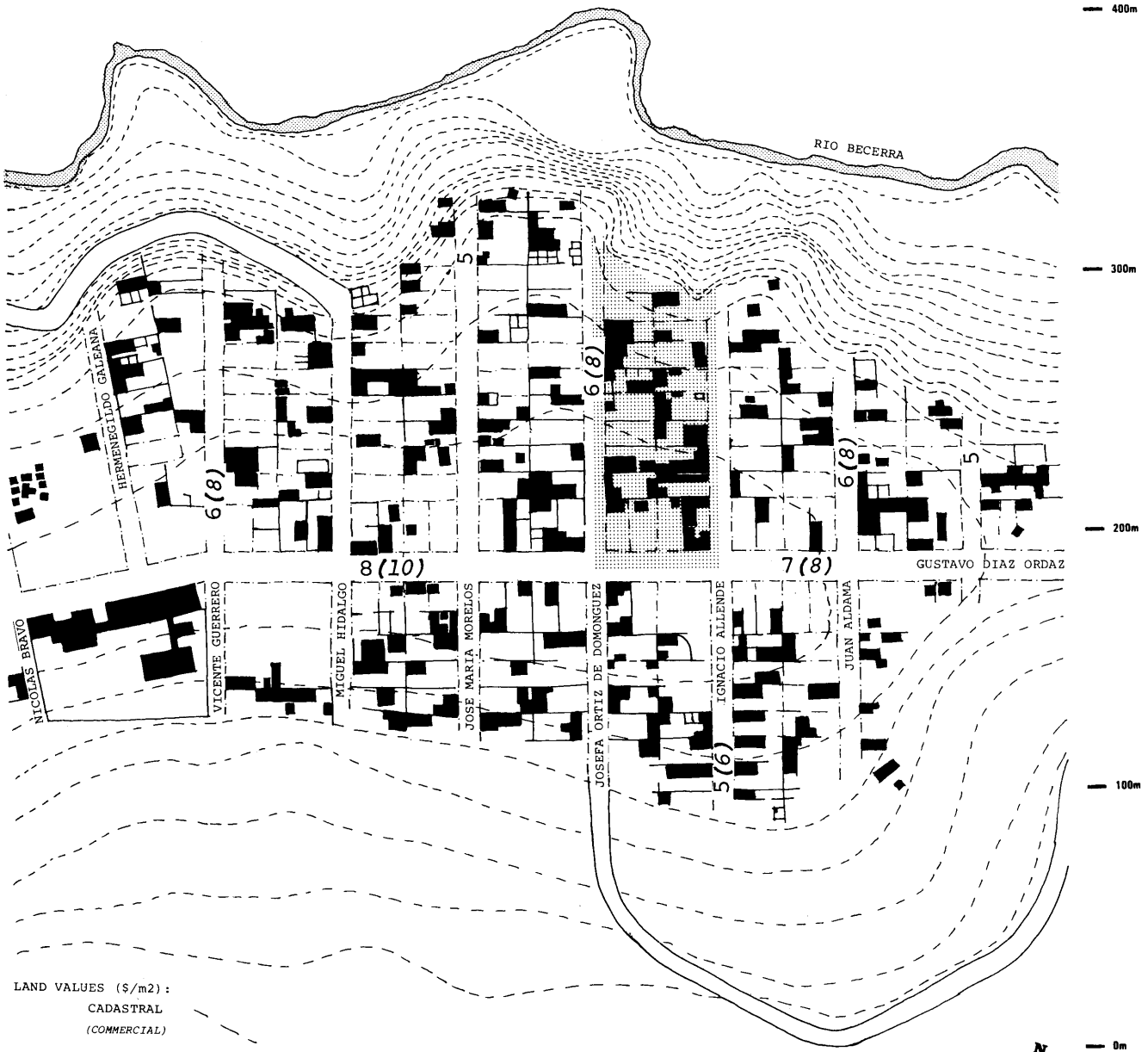
PRIVATE, LOW INCOME, ROW HOUSES

LAND VALUES:
JALALPA is representative of the early 1970's low income subdivisions, which take place in the western hillside periphery. These colonias are developed when land owners, speculating with their property, work their way through to subdivide it - with or without official permit. Usually, subdivisions have no relation with other neighboring colonias, since each have a particular layout, according to promoter's interest and to site's topographical conditions. The only common characteristic is that colonias have the same access road that connects them with the city.

Of new colonias proletarias, JALALPA can be considered as a regular size development of 540 lots distributed in 18 ha. (DGPHP 1971) The segment plan shows only 230 lots in 8 ha., which represent half the locality. The estimated population of JALALPA is only 1500 inhabitants, because approximately 50% of its lots are still vacant.

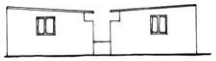
JALALPA's layout follows a grid-iron pattern. Due to its peculiar topographic characteristics, being located along a hill top, the central street is the main circulation spine to which perpendicular streets intersect. Residential blocks have the same width but different lengths. The residential lots have the same dimensions in all the locality: 10m. x 20m.; and have a gross area of 260 m2 of which 23% is for circulation purposes.

Although the colonia was developed after the publication of the 1970 Cadastre Value Album, it was found that the DDF's appraisal office was preparing its assessment for the 1975 Album. The preliminary values given by that office, have been deflated to 1970 prices. The lowest land values ($3-$5/m2) belong to those lots with difficult topographic conditions. The highest values ($8-$10/m2) belong to lots that face the central avenue.

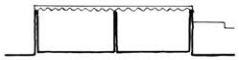


LOCALITY SEGMENT PLAN

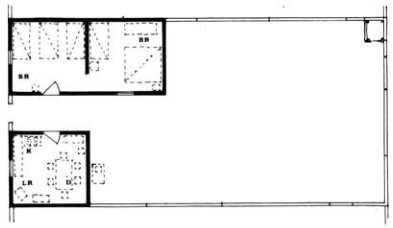
1:2500



Elevation



Section



TYPICAL DWELLING

CONSTRUCTION VALUES:

Since the colonia has been recently developed, the majority of dwellings are at early construction stages. Most of its population is low income, that is self-building their own houses.

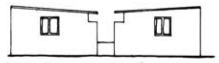
Dwellings are initially composed of one 16 m2 room which serves as a multi-purpose room, to which other rooms are gradually added. The typical dwelling considered has 3 rooms, which include two bedrooms and one room used for cooking, dining and living activities. The dwelling constructed area is 50 m2.

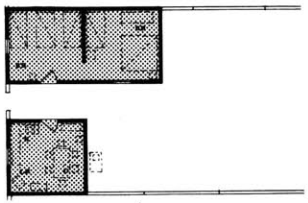
Households in this colonia are formed by very young members. Its size average is 6 persons. The constructed area per member ranges from 6 to 9 m2, but will increase as the dwelling expands.

Typical dwellings' construction values reflect their minimum quality: cement block walls, ground floors, asbesto-cement roofs. Values reflect also their stage of completion. The value appraised for the dwelling shown is $10/m2. (HB 1974) Values may seem low, but are indeed high, since families purchase construction materials at retail prices in nearby stores, which normally hold substantially higher prices than wholesale stores. (Turner 1971:VI-9)

Official cadastre does not include in its category--value, dwellings which are at early construction stages.

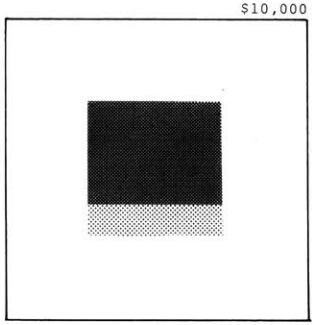
DWELLING UNIT VALUE DIAGRAMS



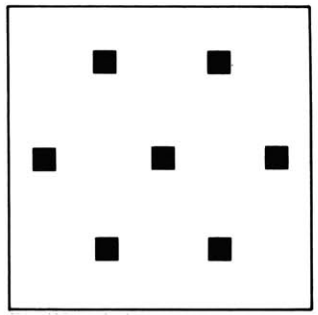


DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Value:	Land	1600
	Construction	500
	Total	2100



VALUE PERCENTAGES: Land 76.2
Construction 23.8



JALALPA, Mexico City: (left) The photo dramatizes how local dwellers have adapted to topographic conditions. The cliff is used as garbage damp. Some dwellers raise animals -chickens, turkeys, pigs- as a side income. (J.Bazant, 1974)

3 LOMAS SAN AGUSTIN

PRIVATE/POPULAR, LOW INCOME, ROW HOUSES

LAND VALUES:
This case study is located on the western periphery hillsides. The locality's topography has varied slopes, which determines its layout pattern.

The LOMAS DE SAN AGUSTIN colonia has approximately 1500 lots and covers 50 ha. Its estimated population is 15,500 persons. The segment plan on the right, covers an area of 400 m. x 400 m. and has approximately 450 lots. It represents one third of the locality. (DC 1973)

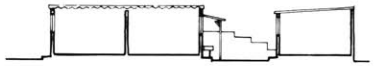
The regular grid pattern is located where slopes are gentle (below right), while irregular patterns follow topographic contours (above left). This is also because "regular" patterns are planned subdivisions, while "irregular" ones are their gradual expansion towards sloped areas. This situation creates a wide variety of blocks' shapes and dimensions. The regular blocks average a gross area of 0.743 ha., which includes 24% of circulation areas. The irregular blocks vary from 0.162 to 0.851 ha. gross area; and have a minimum attributable public area since streets are very narrow due to slope. Lot sizes vary according to blocks. In the first case, lots' net area range from 200 m2 to 300 m2 within the same block. The typical lot in this segment has 200 m2. On irregular blocks, lots are smaller and range from 100 m2 to 200 m2.

The State of Mexico's Cadaster Office has determined a base land value for this locality of $8/m2. (DC 1973)

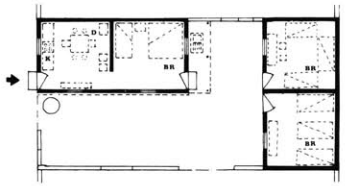
Market land values are low and respond to lots physical characteristics and accessibility. The selected block appraised land value is $12/m2. (HB 1974) Land values are higher in the Toluca-Naucalpan road, or in locality's commercial streets, but are not representative of its low income housing.

LOCALITY SEGMENT PLAN

Elevation



Section



Plan

TYPICAL DWELLING

CONSTRUCTION VALUES:

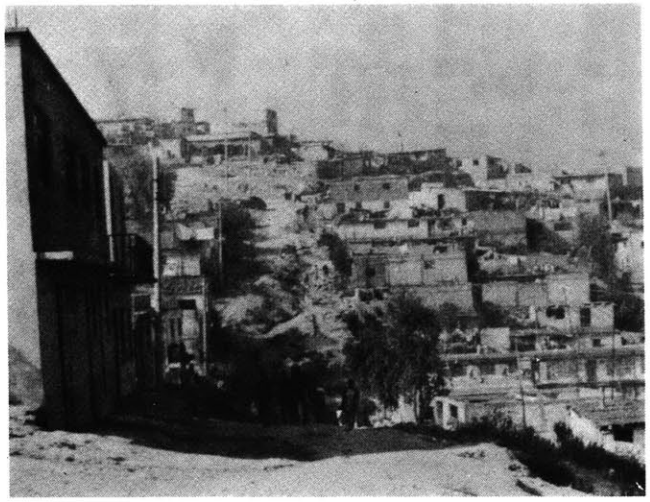
The colonia's predominant land use is residential. This part of the colonia was developed in the mid 1960's, so most dwellings have been under construction process for almost 10 years.

The majority of dwellings are still expanding, but some have reached completion. Typically, dwellings have expanded to fulfill family's needs. The common 3 bedroom, kitchen-dining room house averages 64 m2.

Household size is normally 8 members, of which two are family's relatives. (Vives 1972) The average area per person is 6 m2 to 8 m2.

The State Government doesn't consider values for dwellings that are not completed.

The dwelling's construction has been appraised at $12/m2 (HB 1974), since it has the basic shell (cement block walls, asbesto-plate roof) and has added a cement layer in the floor and frames to windows and doors' openings.



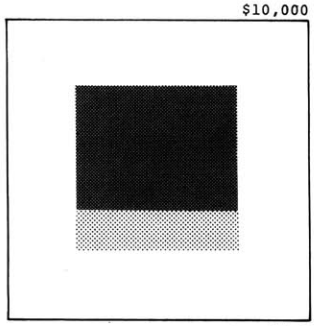
LOMAS DE SAN AGUSTIN, Mexico City: (left) The panorama shows the northern boundary of the locality, facing the Los Remedios settlements. Notice that erosion has made the front street unaccesible for vehicular circulation. Houses constructed on sloped land are adapted to the slope by building of terraces. (J.Bazant, 1974)

DWELLING UNIT VALUE DIAGRAMS

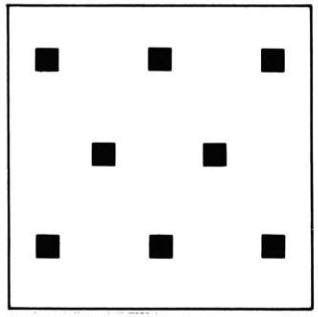
DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Value:	Land	2400
	Construction	768
	Total	3168

$10,000



VALUE PERCENTAGES: Land 75.8
Construction 24.2



VALUE INTENSITY: $/Person 396
50 Dollars

4 NETZAHUALCOYOTL

PRIVATE, LOW INCOME, ROW HOUSES

LAND VALUES:
This new colonia proletaria is located in Metropolitan Area's eastern part, which once was the bed of Texcoco lake. This colonia sprawled to uncommonly large scale because of land characteristics: flat and sandy salted soil; therefore unproductive and inexpensive.

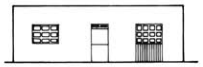
NETZAHUALCOYOTL can be considered the largest homogeneous land subdivision in the Metropolitan Area. It has some 137,000 lots and covers an area of 4000 ha. (Pichardo 1972: 270) Its population is 580,000 inhabitants. (EM 1971:II-49) The segment plan shown of 16 ha. has approximately 760 lots, which represents 1/275th of the locality.

Its layout pattern is extremely regular and monotonous. All blocks have similar dimensions 32m. x 234m. The blocks gross area is 1.120 ha., of which 33% is attributed for circulation use. The lot sizea are similar: 9m. x 16m. Due to the high percentage of public use, lots gross area increase considerably to 215 m2.

The State of Mexico's Cadastre Office has set a base land value of $12 m2 to $14 m2 for interior blocks. (DC 1974)

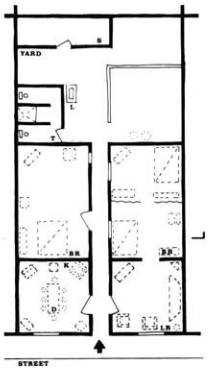
Market land values for this segment range from $16/m2 on interior lots and reaches $36/m2 and higher in lots facing main avenues. The interior lot appraised value is $18/m2, which is representative of the zone. (HB 1974)

LOCALITY SEGMENT PLAN



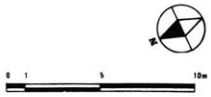
Elevation

Section



Plan

TYPICAL DWELLING



NETZAHUALCOYOTL, Mexico City: (left) This is the back part of the house. Notice the construction materials and the activities in the yard. Bricks are stored for later improvements. (J.L.Cortes, 1973)

CONSTRUCTION VALUES:

Since the colonia started in early 1960's, most dwellings in the segment analyzed are already at later construction stages.

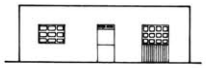
Dwellings not only have expanded to cover the family's basic needs, but have added extra space as well. Normally, they have 3-4 bedrooms, kitchen-dining room and in this case a separate living room, all which covers 80 m2. Besides the family has built in the backyard a washing room and storage. This expansion approximately adds 20 m2 more to dwelling's area.

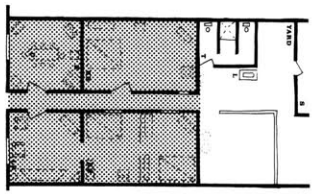
Households are generally formed by young people, and average 6 members in size, of which 1 is a relative living with the family. The constructed area per person is 12 m2 to 17 m2.

The State Government Cadastre Office does not set any values for dwellings that are completed but lack basic service supply.

This low cost construction was appraised at $16/m2, (HB 1974) since to the common cement-block walls, concrete roof, cement layer floor; the owners have added windows and doors, have plastered the walls, and sometimes painted them.

DWELLING UNIT VALUE DIAGRAMS

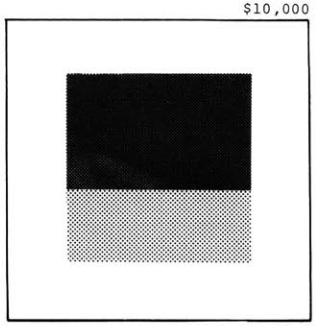




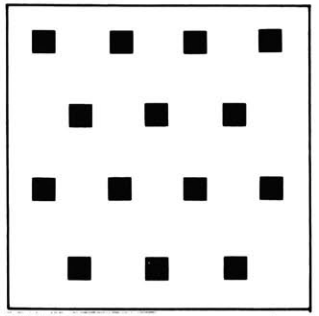
DWELLING PLAN/ELEVATION

Areas:		
	Land	
	Construction	
Values:	Land	2592
	Construction	1600
	Total	4192

$10,000



VALUE PERCENTAGES: Land 61.8
Construction 38.2



VALUE INTENSITY: $/Person 699
50 Dollars

5 PRO HOGAR

PRIVATE, LOW INCOME, ROW HOUSES

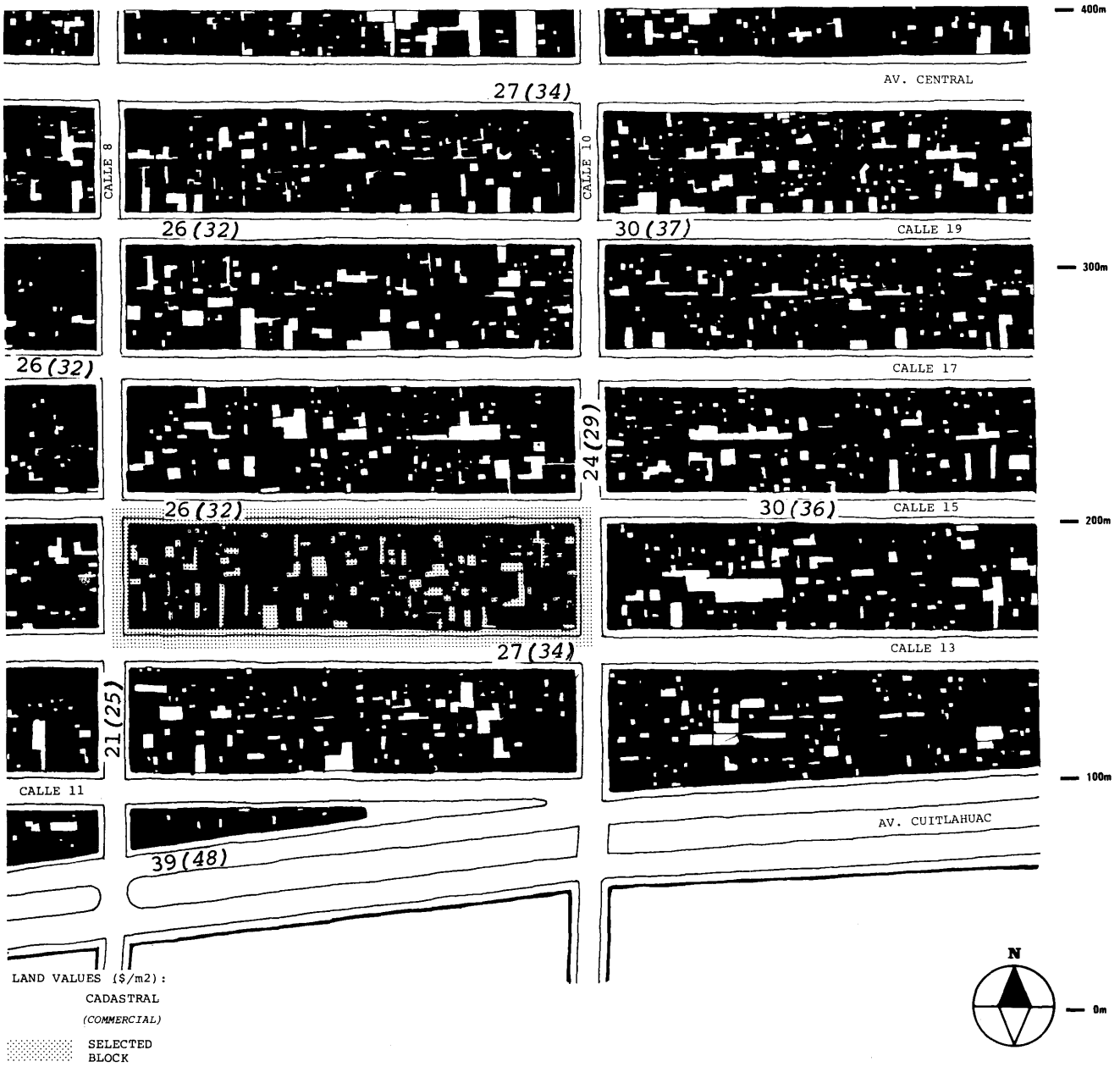
LAND VALUES:
This case study is located within the intermediate ring. The colonia is predominantly formed by low to moderate-low income population. Its land use is residential.

The colonia has approximately 1860 lots and covers an area of 66 ha. (DGOP 1951) Its population is 28,500 persons. (OPR 1973) The 400m x 400m segment shown, includes 435 lots, which represent one fourth of the locality.

PRO-HOGAR is a private development. Its layout follows a grid-iron pattern, with similar block dimensions 40m x 170m. Blocks' gross areas are 0.960 ha., which include 29% of circulation. The lots are standard size: 10m. x 20m. Their gross area including public use areas are 285 m2.

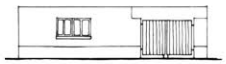
Cadastre land values are quite uniform on interior blocks, ranging from $24/m2 to $27/m2. In Cuitlahuac Avenue land values run as high as $39/m2. (DCIP 1970)

Market values are also homogeneous. The selected block appraised land value is $32/m2. (HB 1974)

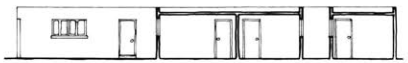


LOCALITY SEGMENT PLAN

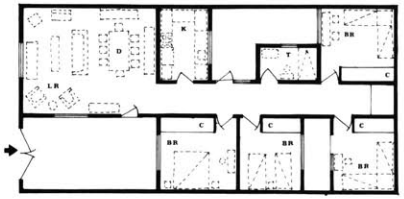
1:2500



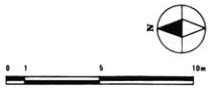
Elevation



Section



Plan



TYPICAL DWELLING

CONSTRUCTION VALUES:
This locality is uniformized with one story dwellings. Since the colonia was developed in the mid 1940's, most dwellings have been completed.

Dwellings occupy most of lots' area. The typical dwelling has 3-4 bedrooms, a bathroom, dining-living room and a kitchen, all which add an area of 135 m2. The remaining area of the lot includes a garage and interior patios.

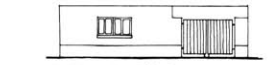
Households are generally formed by middle-aged people. Its average size is 7 members of which 1-2 are normally relatives. The constructed area per person is 16 m2 to 19 m2. It often happens that when family reduces its size (or is in need), it adapts the front room as a shop, and re-arranges one bedroom as living-dining room.

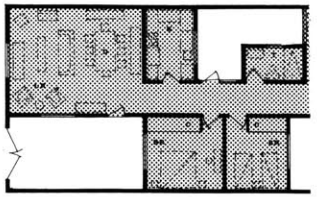
The cadastre values defined in the "Official Construction Value Table" range from $16/m2 to $36/m2, which correspond to low cost construction category. (DCIP 1970)

The construction of this dwelling was appraised at $22/m2 (HB 1974), because it has been completed (brick walls, concrete roof) and includes finishings (plaster, painting, floor tiles, closets, and so on). However, value centers around its service facilities: bathroom and kitchen. For the materials involved in the original construction, this value is low; but this is explicable because constructions have depreciated...as its land has appreciated.

PRO-HOGAR, Mexico City: Along the streets are seen the typical one family, one story dwellings. Small shops are scattered in the locality, some as an extension or adaptation of the dwellings. Notice the many trees, the absence of automobiles and dominance of pedestrians. (J.Bazant,1974)

DWELLING UNIT VALUE DIAGRAMS

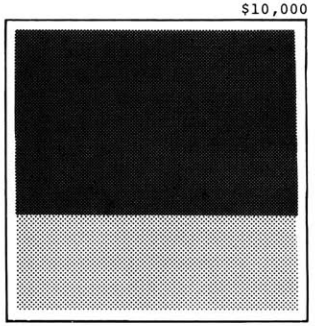




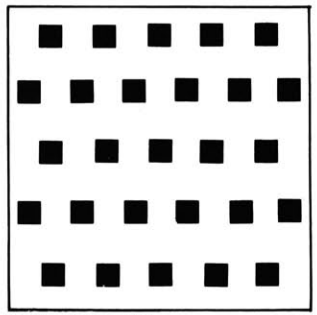
DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Values:	Land	6400
	Construction	2970
	Total	9370

$10,000



VALUE PERCENTAGES: Land 68.3
Construction 31.7



VALUE INTENSITY: $/Person 1339
50 Dollars

6 VALLEJO

PRIVATE, LOW INCOME, WALK-UP APARTMENTS

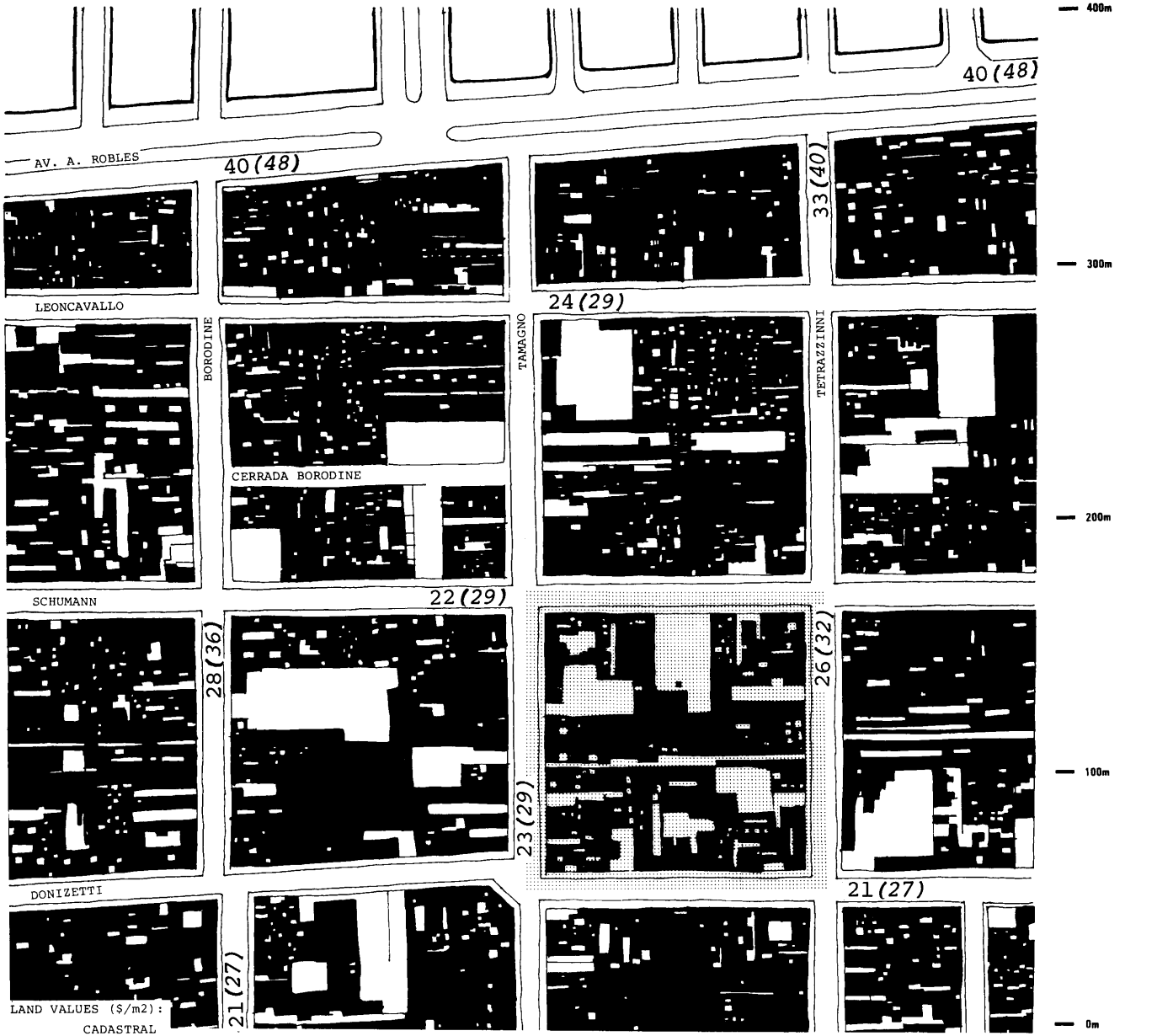
LAND VALUES:
This colonia is located in the northern part of city's inner ring. Its layout doesn't follow a regular pattern, therefore blocks vary in dimensions.

This case study includes 1800 lots and covers an area of 90 hs. Its population is 35,000 persons. (OPR 1973a) The segment plan shown covers 16 hs. and has approximately 290 lots. This segment represents 1/6th of the locality.

The selected block's gross area is 1.299 hs. of which 23% is of public use. In spite of the fact that blocks are regular in shape, their lot subdivisions are not. There is a large variety of lot sizes ranging from the smallest 90 m2 to the largest 1000 m2 in the same block. (DGOP 1949) Lot subdivisions result from their land utilization. This locality is characterized for having mixed land uses: light industries and commercial facilities along with housing. The smaller lots are generally used for residential purposes, while the larger ones are occupied by industries, garages, parkings, auto-repair shops, and so on. The average net lot area is 200 m2 which is representative of residential land use. It is observed that lot area is within similar ranges as in other low income subdivisions.

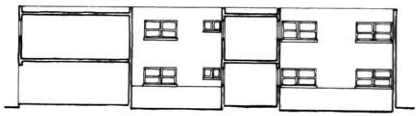
Cadastre land values of this locality are variable, according to lots' shapes, dimensions and use. Land value ranges from $21/m2 on interior blocks to $40/m2 in Robles Avenue. (DCIP 1970)

Market values are low as far as residential lots are concerned. Interior residential lots were appraised at $29/m2. (HB 1974)

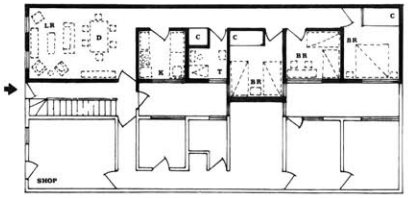


LOCALITY SEGMENT PLAN

Elevation

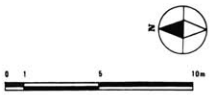


Section



Plan

TYPICAL DWELLING



CONSTRUCTION VALUES:
VALLEJO was developed in the early 1940's. When industries settled, they stimulated along residential development.

The typical 3 bedroom, bathroom, kitchen and living-dining room apartment has an area of 90 m2. This type of apartment usually has defficiencies in ventilation and illumination, since they are constructed very compactly.

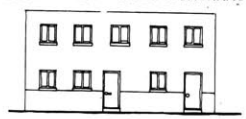
Household size averages 6 members. The constructed area per person is 12 m2 to 15 m2.

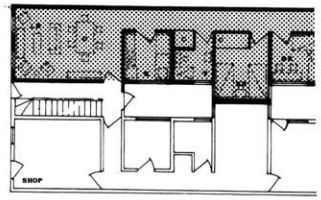
Cadaster values for this construction quality range from $18/m2 to $36/m2. Constructions are officially considered low cost. (DCIP 1970)

The construction of this two story building was appraised at $36/m2 (HB 1974), since it has a reinforced concrete structure and adequate service facilities. Construction materials are low cost and finishings are deteriorated. Construction values are low because buildings are already depreciated.

VALLEJO, Mexico City: (left) The photograph show the type of housing which is typical of the locality: the walk-up apartments. Notice how some are still expanding one story more. (J.Bazant, 1974)

DWELLING UNIT VALUE DIAGRAMS

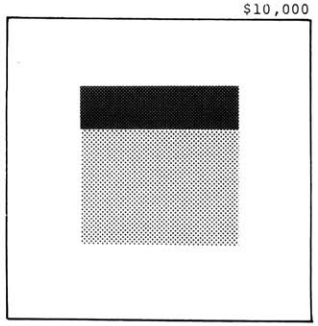




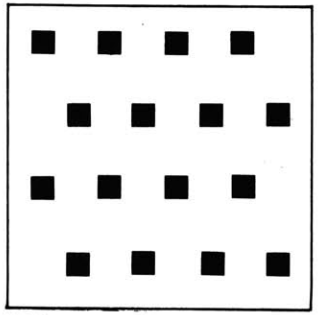
DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Values:	Land	1450
	Construction	3240
	Total	4690

$10,000



VALUE PERCENTAGES: Land 30.9
Construction 69.1



VALUE INTENSITY: $/Person 782
50 Dollars

7 LAS VIZCAINAS

PRIVATE, LOW-INCOME, ROW ROOMS

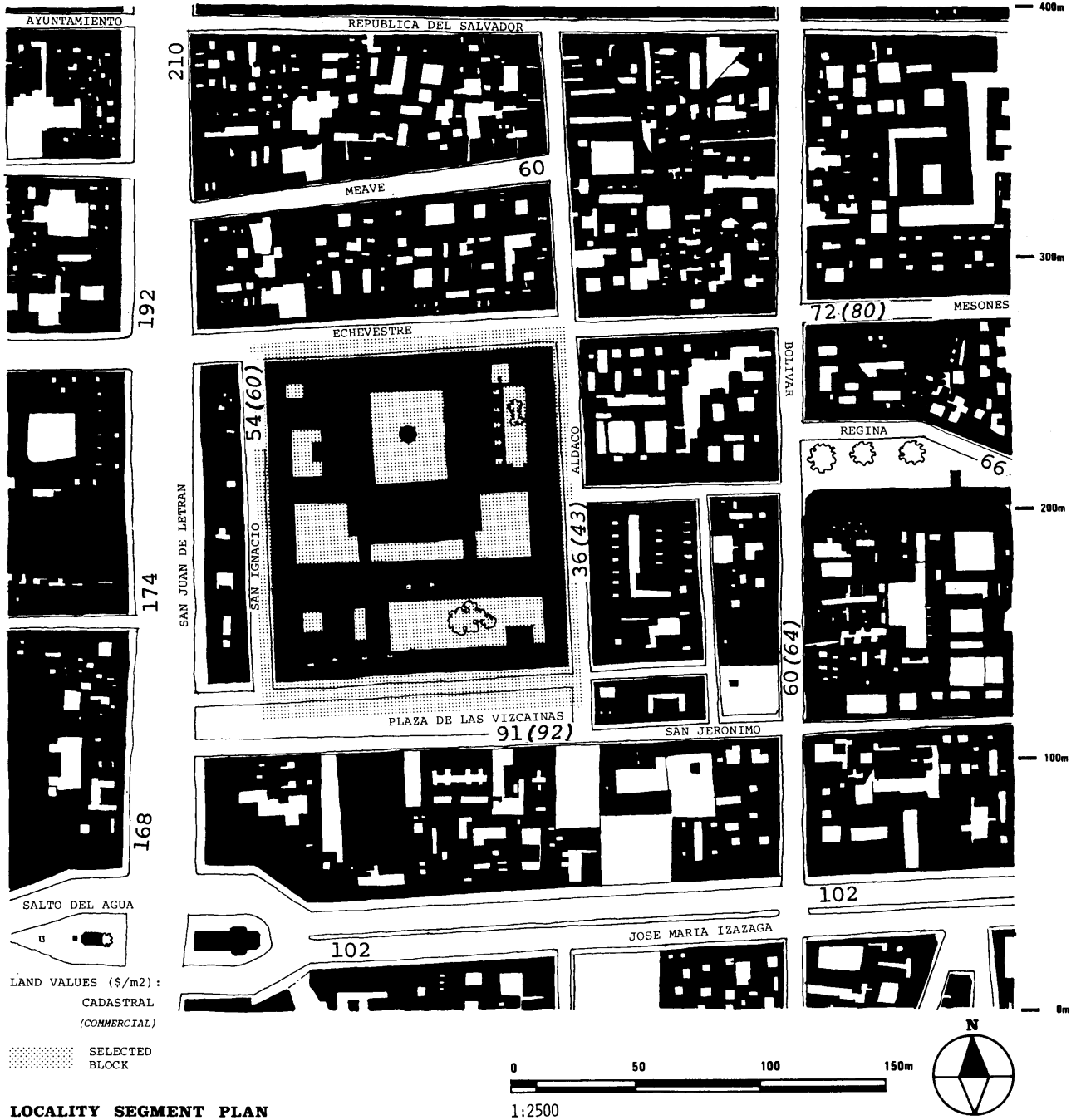
LAND VALUES:
This case study is located in downtown Mexico City. The locality is predominantly formed by low income tenements. It is a highly commercial zone.

Its layout has been traced since the colonial period. Its irregular pattern is because streets were traced following one time canals, pathways, or property lines.

LAS VIZCAINAS is an exceptional example of a colonial building which includes housing for low income population. This building occupies a 125m x 140m block (DC 1934) and has a gross area of 2.13 hs., 19% of which is for circulation purposes. Actually, 550 persons live there.

Land values in this zone are very high, both cadastral as well as commercial. The segment plan contains a range of its values.

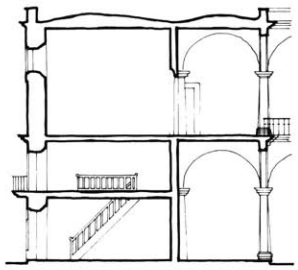
City regulations considers colonial buildings as "historic monuments," and protects them from change. Values are not included since building is withheld from the real estate market.



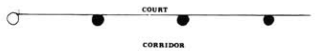
LOCALITY SEGMENT PLAN

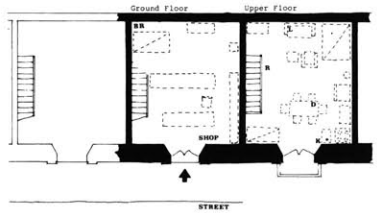
1:2500

Elevation



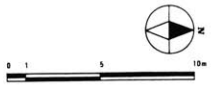
Section





Plan

TYPICAL DWELLING



CONSTRUCTION VALUES:

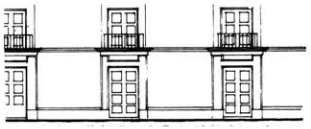
This colonial building has uncommon characteristics. It was originally constructed as a school, which continues to operate. Classrooms are located around its interior patios.

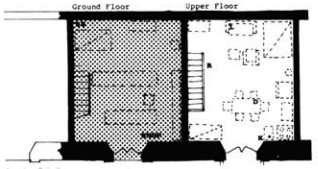
The building contains 58 apartments which are located along property's perimeter. Apartments were initially meant for craftsmen and have the so-called "plate and cup" arrangement. The ground floor part is meant to be a workshop, while it's upper level is meant to be for living purposes. Nothing has changed in all this time, except perhaps the rear part of shops have been adapted as bedrooms also. Apartments have 96 m2 area.

Household size in this case is 8 members. The constructed area per person is 16 m2, including the shop area, and 8 m2 if shop is not included.

The construction is in fairly good condition, in spite of the building being over two centuries.

DWELLING UNIT VALUE DIAGRAMS





DWELLING PLAN/ELEVATION

Areas: Land

Construction

Value: Land

Construction

Total

LAS VIZCAINAS, Mexico City: The photo shows the south side of the block. Notice that all the doors have a window on the upper floor; the lower rooms are utilized for shops during the day and for sleeping during nightime. The upper rooms are multi-purpose rooms. (E.Espinosa,1973)

8 TEPITO, la casa grande

PRIVATE, LOW INCOME, APARTMENTS

LAND VALUES:
The Tepito zone is located within the inner ring. Low income tenements predominate in this locality. Most have been constructed for over half a century.

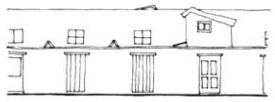
The urban layout of this locality follows an irregular pattern. CASA GRANDE is an exceptional tenement as it occupies 82% of block's area. (DC 1937) The tenement's gross area is 0.940 hs. including 23% of circulation. The attributed gross area per apartment is 31 m2, which include its attributed interior common area. This gross area is taken as base to estimate the apartment's attributed land value.

This tenement is perhaps one of the largest in the Metropolitan Area, since it includes 157 apartments plus courts, washing sinks, and toilets for common use. Without doubt CASA GRANDE is a well known tenement since it was the scenario of Lewis' "Children of Sanchez." Its population is 964 persons.

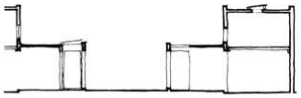
Cadastre values are uniform in the locality and range from $27/m2 to $39/m2. (DCIP 1970)

Market values do not differentiate from Cadastre values, because the zone is old, deteriorated and its housing is saturated. This zone, then, does not generate any housing supply. CASA GRANDE's lot was appraised at $38/m2. (HB 1974)

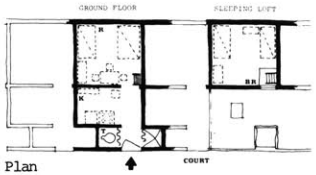
LOCALITY SEGMENT PLAN



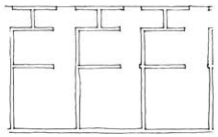
Elevation



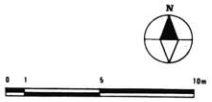
Section



Plan



TYPICAL DWELLING



TEPITO, Mexico City: This is a general view of La Casa Grande. It shows a row of apartments facing the street. Inside the block there are more apartments and a network of open courts. The tree is a central element in the interior walkways. (E.Espinosa,1973)

CONSTRUCTION VALUES:

CASA GRANDE was constructed in the early 1900's. The segment plan shows the row of peripheral apartments, with interior walkways and more apartment units.

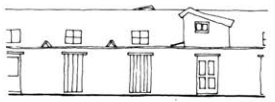
Tenement apartments are very small in size. They usually consist in one room apartment with annex kitchen and toilet facilities. The dwelling has an upper sleeping loft. The area of this typical apartment is 22 m2.

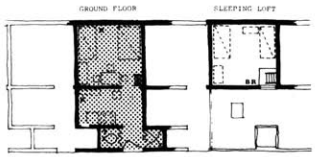
Average household size is 6 members which crowd in the apartment only to sleep. This is why most family activities are usually performed in common walkways, which stimulates gathering and community's kinship relationships. The covered area per person is only 4 m2.

According to the "Official Construction Value Table" the tenements' construction values range from $3/m2 to $8/m2. (DCIP 1970) Constructions fall into the category of old and low quality.

The construction component of this tenement was appraised at $6/m2. (HB 1974) Tenements have been constructed with low cost materials which have deteriorated for the lack of maintenance. Usually all finishings are in very bad condition, but the sanitary facilities are still working.

DWELLING UNIT VALUE DIAGRAMS

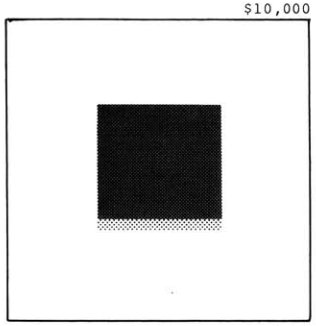




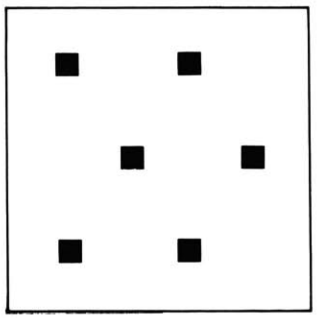
DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Values:	Land	1754
	Construction	132
	Total	1886

$10,000



VALUE PERCENTAGES: Land 93.0
Construction 7.0



VALUE INTENSITY: $/Person 314
50 Dollars

9 TEPITO, la florida

PRIVATE, LOW INCOME, APARTMENTS

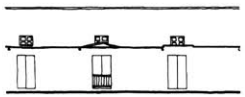
LAND VALUES:
The block where this case study is (named after La Florida Street) has a regular shape and measures 110m x 220m. The tenement building is located approximately in the upper middle part of the block (the lower part doesn't appear in plan). This block has 56 lots with a variety of areas ranging from 220 m2 to 4034 m2. (DC 1937)

The 46 apartments in LA FLORIDA occupy a gross area of 1690 m2 including 8% of exterior circulation areas. The gross area per dwelling unit is 33 m2, which is the attributed land area per apartment. The population of LA FLORIDA is 253 persons.

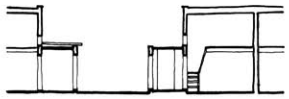
The lot's cadastre value is $42/m2 (DCIP 1970) which is one of the highest values in the locality. Values are high (in relation to the zone) because the street is very commercial.

The lot in LA FLORIDA has been appraised at $43/m2. (HB 1974)

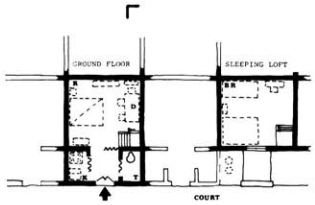
LOCALITY SEGMENT PLAN

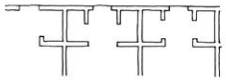


Elevation

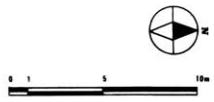


Section

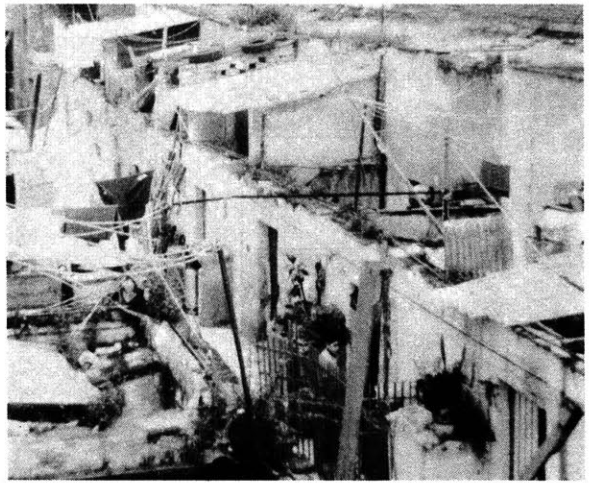




Plan



TYPICAL DWELLING



CONSTRUCTION VALUES:
LA FLORIDA represents the typical tenement with central court that gives access to surrounding apartments.

All tenement apartments are similar. In this case, apartments have one room with a small kitchen and toilet annexed. Apartments include an upper sleeping loft. Their average area is 26 m2.

Household average size is 6 members. The covered area per person is 3 m2 to 5 m2. Space limitation stimulates the use of central court as an extension of apartments.

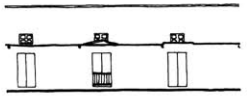
This tenement building is old and completely deteriorated. This has been a consequence of a mid 1940's law that froze rents. Rents since then are at below market levels. Rent control has discouraged property owners to invest in its maintenance.

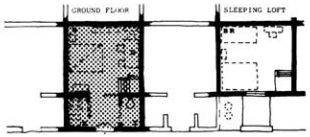
Construction values range from $3/m2 to $16/m2 as defined in the "Official Construction Value Table." (DCIP 1970) Constructions are considered old and depreciated.

Market values of constructions are also low because of buildings physical conditions and their legal constraints. Their construction quality has been appraised at $4/m2. (HB 1974)

TEPITO, Mexico City: This is a general view of the tenement. It shows the row of apartments with the open semi-private court. Notice the different heights of the roofs; the improvements are made by the users. (E.Espinosa, 1973)

DWELLING UNIT VALUE DIAGRAMS

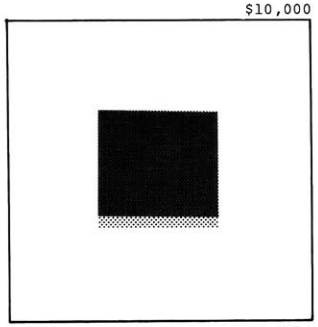




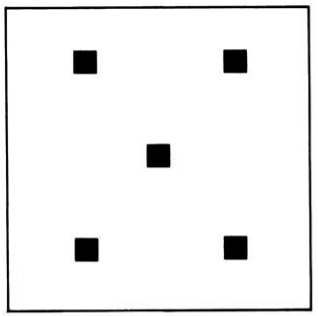
DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Values:	Land	1452
	Construction	104
	Total	1556

$10,000



VALUE PERCENTAGES: Land 93.3
Construction 6.7



VALUE INTENSITY: $/Person 259
50 Dollars

10
SAN JUAN DE ARAGON

PUBLIC, MIDDLE INCOME, ROW HOUSES

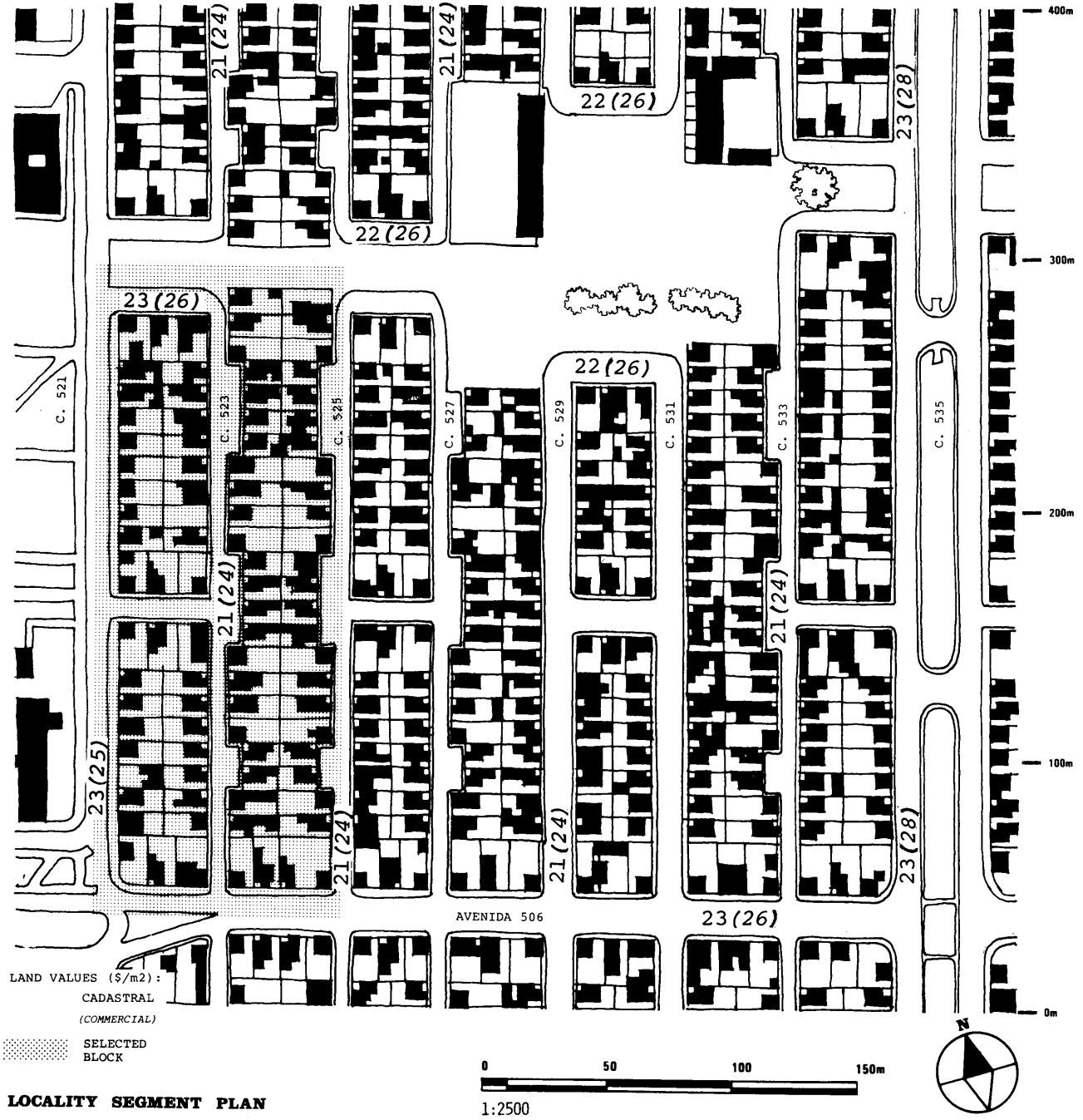
LAND VALUES:
This case study is located in the northern part of intermediate ring. The project is a land subdivision meant for upper-low to middle income population.

The housing project has 9927 dwellings and covers an area of 193 hs. (SHCP 1964) To give an idea of its magnitude, the segment plan shown covers 16 hs. and contains approximately 400 dwellings which represents 1/12th of the locality. SAN JUAN DE ARAGON's population is 55,000 persons.

The layout follows a grid-iron pattern, with additional "open" areas for community facilities. The open areas are interconnected and form a pedestrian walkway system.

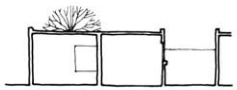
All blocks have the same width, but vary in length. They have several lot sizes, like the common 10m x 19m in the middle of the blocks, and 13m x 19m in blocks' extremes. Another lot size is 10m x 16m that results when its length is reduced 3m for parking facilities. The 10m x 19m lot was selected as representative of this locality. Its gross area is 303 m2 including 34% of public use areas.

The cadastre values are uniform and range from $21/m2 on interior lots to $23/m2 on lots facing main avenues. (DCIP 1970) The interior lot has been appraised at $24/m2. (HB 1974)

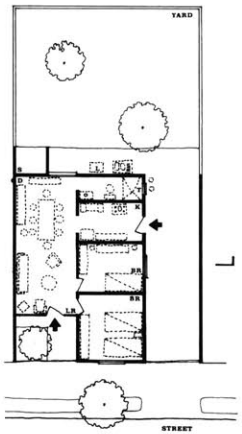


LOCALITY SEGMENT PLAN

Elevation

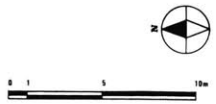


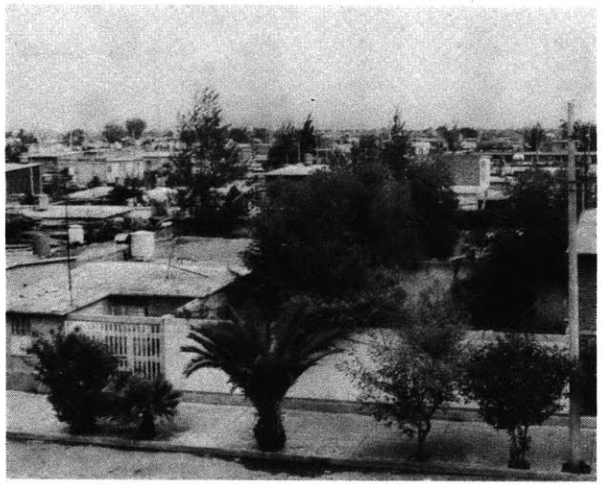
Section



Plan

TYPICAL DWELLING





CONSTRUCTION VALUES:
In this housing project, dwellings vary in size according to their number of bedrooms. All have garage and a backyard.

The selected dwelling has two bedrooms, kitchen, bathroom and living-dining room. Its constructed area is 64 m2.

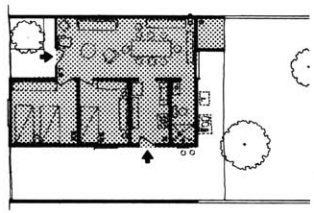
This typical dwelling has a 4 member family. The constructed area per person is 16 m2.

Cadastre values for this construction quality range from $38/m2 to $52/m2. (DCIP 1970) According to the "Construction Value Table," this range corresponds to recent dwellings of "medium" construction quality.

Actually, the construction quality is very good. Dwellings are built with low cost materials but have all the finishings plus extra facilities as an outdoor sink for washing, storage room, and so on. Dwellings also have fully equipped kitchens and bathrooms. The appraised value for this construction quality is $48/m2. (HB 1974)

SAN JUAN DE ARAGON, Mexico City: This is an example of a typical one story house. The dwelling unit has been improved by the owner by providing the door and the fence. Notice the uniformity in houses. (R.Davila,1973)

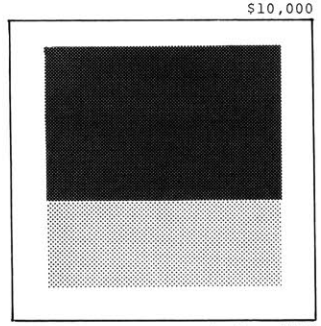
DWELLING UNIT VALUE DIAGRAMS



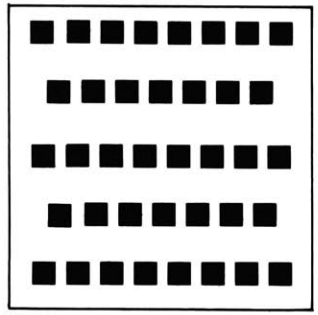
DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Values:	Land	4560
	Construction	3072
	Total	7632

$10,000



VALUE PERCENTAGES: Land 59.8
Construction 40.2



VALUE INTENSITY: $/Person 1908
50 Dollars

11 IZTACALCO

PUBLIC, MIDDLE-INCOME, WALK-UP APARTMENTS

LAND VALUES:
This housing project is located in the southern part of the intermediate ring.

The project covers approximately 74 hs. and contains 5690 apartments. The estimated population that this project expects to house is 30,000 persons. (INFONAVIT 1973) The 400m x 400m segment plan covers 1/5th its area and has approximately 1150 apartments.

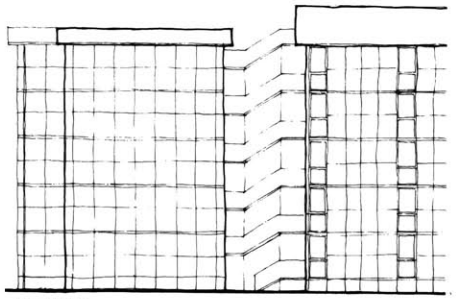
The layout pattern concentrates in "open" areas to which building create their spatial quality. The selected "block" analyzed contains 84 apartments distributed in a gross area of 1.00 hs, of which only 25% is for private use, leaving the remaining 75% for circulation or recreational use. The gross per dwelling is 77 m2 which is taken as base to estimate each apartment's attributed land value.

Since the project is still under construction, it was difficult to form a judgment of its value.

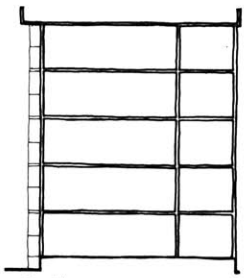
The Cadastre Office of DDF had not assessed the project yet, and was uncertain about giving preliminary figures and determining the nature of this project tax base. Officials indicated however, that "social interest" housing projects were generally tax exempt, at least in the first years after completion.

To obtain IZTACALCO's market value, it was compared with other housing projects that have similar characteristics in land use, landscape and service facilities, but built before 1970. (Unidad Independencia) The information obtained along with Hipotecaria Bancomer's value data, helped determine the value base for this project at $36/m2.
(at 1970 prices)

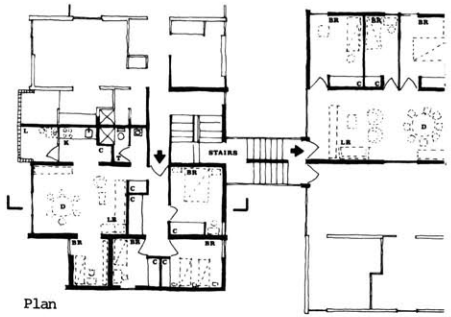
LOCALITY SEGMENT PLAN



Elevation

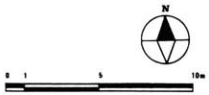


Section



Plan

TYPICAL DWELLING



CONSTRUCTION VALUES:

The typical 4 to 5 story walk-up apartments are characteristic of this project. Buildings offer a variety of dwelling sizes.

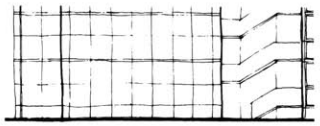
The selected apartment has 4 bedrooms, kitchen bathroom, dining-living room, plus large areas for closets and a small laundry room. This typical dwelling has 80 m2.

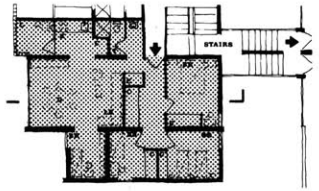
Family's size varies according to dwelling's size. Average households are of 6 members. The constructed area per person is 13 m2 to 20 m2.

Buildings have a fairly good construction quality, considered within the $56/m2 to $80/m2 value range according to the"Official Value Tables." (DCIP 1970)

The construction component of typical apartments was appraised at $68/m2 (deflated to 1970 prices); since buildings require reinforced concrete structure, staircases, water pressure pumps, and other special equipment. (HB 1974)

DWELLING UNIT VALUE DIAGRAMS

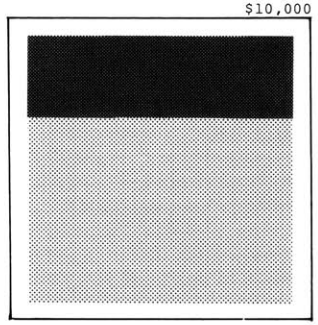




DWELLING PLAN/ELEVATION

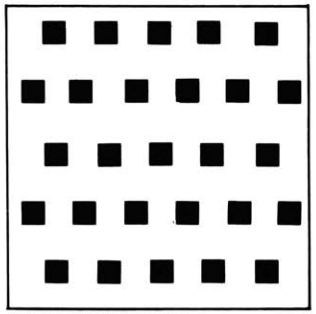
Areas:	Land	
	Construction	
Values:	Land	2772
	Construction	5440
	Total	8212

$10,000



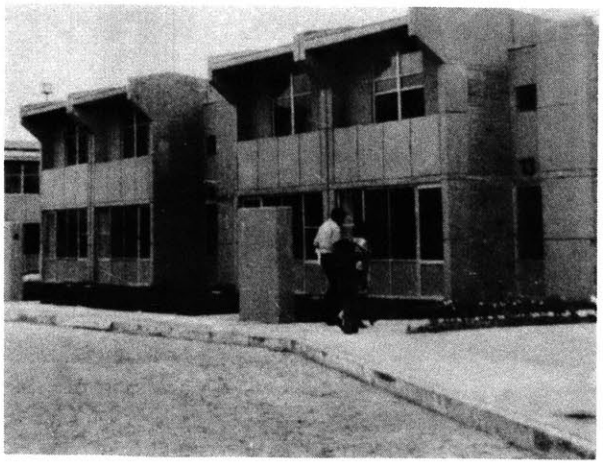
VALUE PERCENTAGES:

Land	33.8
Construction	66.2



VALUE INTENSITY: $/Person 1369

50 Dollars



IZTACALCO, Mexico City: A group of low rise dwellings is shown. The row of houses is facing the parking lot. The typical five story walk-up apartment building has similar construction characteristics. (E.Espinosa,1973)

12
NONOALCO TLALTELOLCO

PUBLIC, MIDDLE INCOME,
WALK-UP/HIGH-RISE APARTMENTS

LAND VALUES:

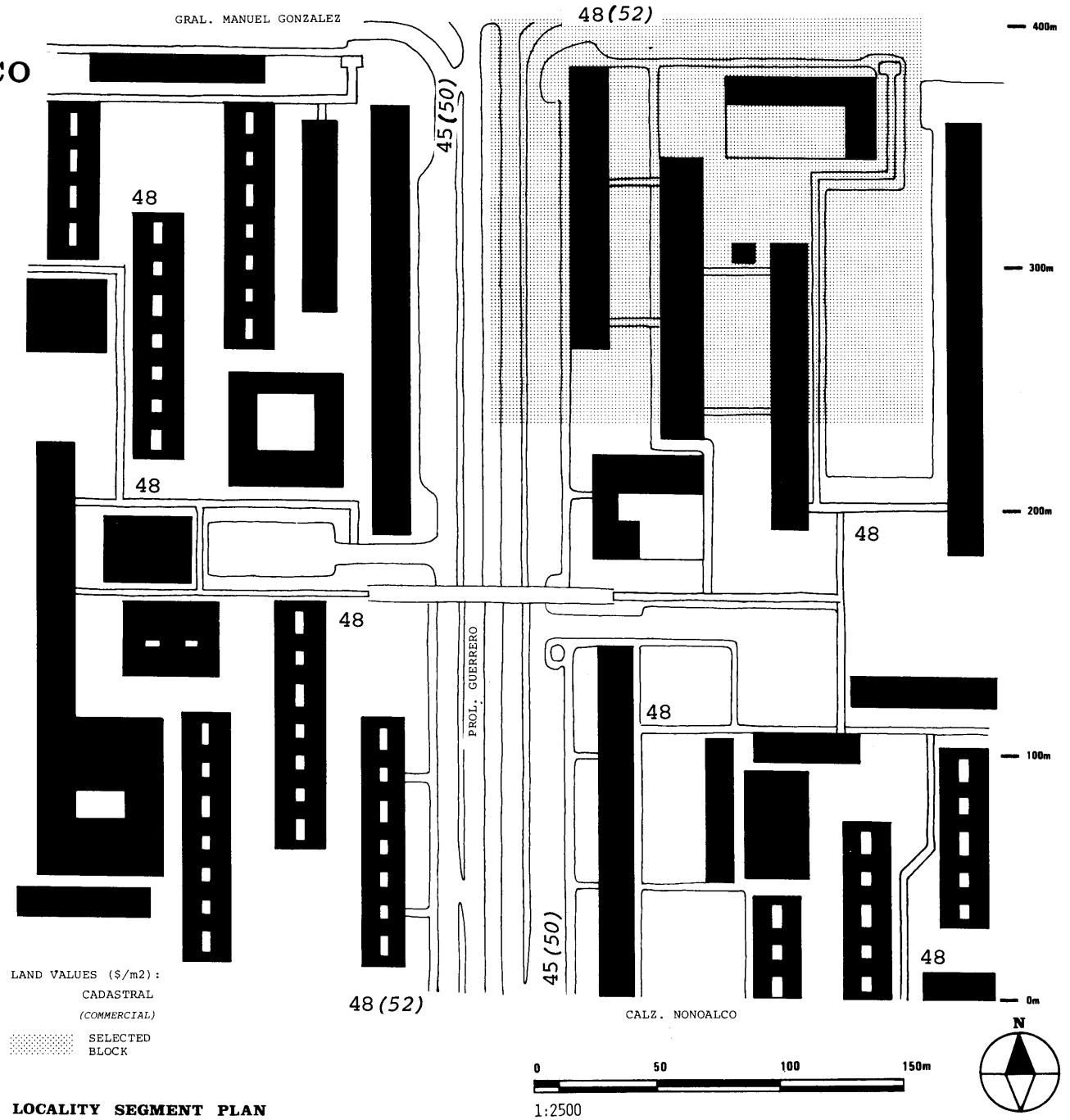
NONOALCO-TLALTELOLCO was built in the mid 1960's. This project covers an area of 115 hs. and has 11,916 apartment units. (BNH 1964) Its estimated population is 70,000 persons. The 16 hs. segment plan has approximately 1600 dwellings, representing 1/7th of the locality.

The general layout is based on super-blocks, each provided with community services and facilities. The project is interconnected with a pedestrian circulation system.

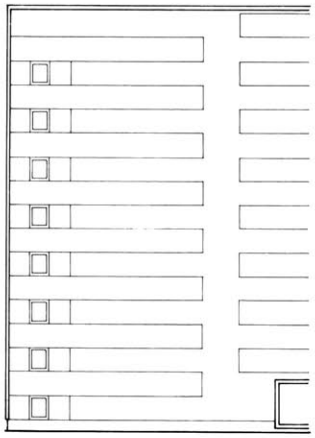
The part of the selected "block" is representative of NONOALCO's layout. This part covers a gross area of 3.15 hs. of which 13% is private land use and 87% is circulation or recreational areas. There are 400 apartments in this block's part. Apartment's gross area is 50 m2, which is the area taken as base to estimate the attributable land value of each apartment.

The Cadastre Office of DDF has set a land value of $48/m2 in all the locality, regardless if buildings which are facing main avenues are high rise or interior buildings are walk-ups. Apartments are levied on an equal land value base. (DCIP 1970)

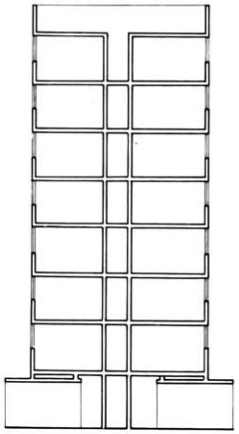
Although land is Public and therefore not commerciable; its location and services are principal determinants of dwelling's value. For analysis purposes, dwelling's value has been divided in two basic components: its construction and land values. Land value in this case has been obtained by considering the market (land) value of properties around NONOALCO. Values were corroborated after, by subtracting from the dwelling's appraised value the attributed value of its construction only--which is established by comparison with similar cases. The attributed land value of dwellings in this block part was appraised at $52/m2. (HB 1974)



LOCALITY SEGMENT PLAN

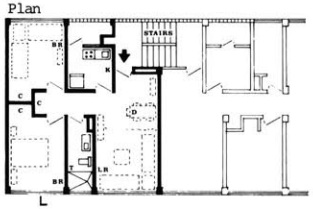


Elevation

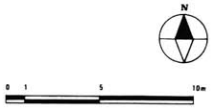


Section

Plan



TYPICAL DWELLING



CONSTRUCTION VALUES:
NONOALCO-TLALTELOLCO is characterized by its high rise buildings, which have 2-3 bedroom apartments.

The selected apartment has two bedrooms, kitchen, bathroom and a living-dining room. It has also areas for laundry and washing. This apartment area is 74 m2.

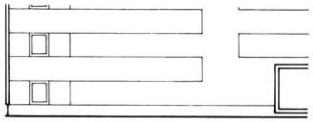
In this case, the apartment accommodates a 4 member family. The constructed area per person is 19 m2.

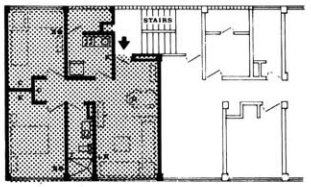
The "Cadastre Value Album" defines the construction value of high rise apartments from $88/m2 to $160/m2. (DCIP 1970)

The construction component of this apartment has been appraised at $92/m2. This value reflects building's equipment: elevators, high pressure water pumps, ducts, sanitary installations, and so forth.

NONOALCO-TLALTELOLCO, Mexico City: (left) The mixture of different kinds of buildings with different heights doesn't create good spatial qualities. (J.Bazant, 1974)

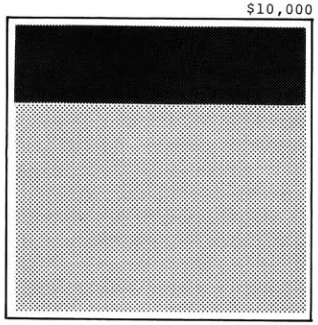
DWELLING UNIT VALUE DIAGRAMS



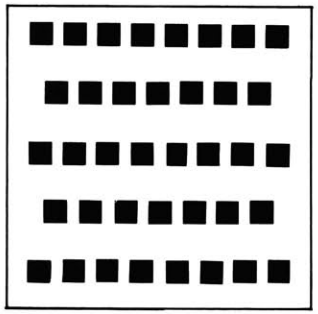


DWELLING PLAN/ELEVATION

Areas:	Land	
	Construction	
Values:	Land	2600
	Construction	6808
	Total	9408



VALUE PERCENTAGES: Land 27.6
Construction 72.4



VALUE INTENSITY: $/Person 1881
50 Dollars

III. URBAN/ DWELLING ANALYSIS

1. COMMUNITY FACILITIES, UTILITIES/SERVICES MATRIX

Category	Population per Category	% of Total Population	LOCALITIES	COMMUNITY FACILITIES: Police	Fire Protection	Health	Schools, Playgrounds	Recreation	UTILITIES AND SERVICES: Water	Sewerage	Storm Drainage	Electricity	Gas (Tank)	Refuse Collection	Public Transportation	Paved Roads, Walkways	Telephone	Street Lighting	Locality
A	200,000	2.3	1. Buenos Aires	■	■	■	■		■			■	■	■	■		■	■	1
			2. Jalalpa	■			■	■	■			■	■		■	■		■	2
			3. Lomas de San Agustin	■			■					■	■		■			■	3
			4. Netzahualcoyotl	■		■	■	■	■			■	■	■	■	■	■	■	4
			5. Pro-Hogar	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	5
B	3,300,000	38.4	6. Vallejo	■	■	■	■		■	■	■	■	■	■	■	■	■	■	6
			7. Las Vizcainas	■	■	■	■		■	■	■	■	■	■	■	■	■	■	7
			8. La Casa Grande	■	■	■	■		■	■	■	■	■	■	■	■	■	■	8
C	2,000,000	23.2	9. La Florida	■	■	■	■		■	■	■	■	■	■	■	■	■	■	9
			10. San Juan de Aragon	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	10
			11. Iztacalco	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	11
D	500,000	5.8	12. Nonoalco Tlaltelolco	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12
	6,000,000	69.7	TOTAL																
		30.3	Middle-High Income																
	8,608,321	100.0	TOTAL POPULATION																

SOURCES:

- *Bazant J.,Cortes J.L.,Davila R.,Espinosa E.(1974), Urban Dwelling Environments in Mexico City,Cambridge Mass., USDP, MIT, p.138.*
- *Oficina del Plano Regulador (1972),Estudio Zonal de la Delegacion de Atzcapozalco, Direccion General de Planificacion DDF, Mexico DF. (unpublished)*
- *_____ (1973),Estudio Zonal de la Delegacion de Gustavo A. Madero, Direccion General de Planificacion DDF, Mexico DF. (unpublished)*
- *_____ (1971), Planos de Usos del Suelo de la Zona Urbana del Distrito Federal.*
- *_____ (1973), Planos de Vialidad y de Servicios de la Zona Urbana del Distrito Federal.*

Instituto AURIS (1973), Estudio Preliminar de Teotihuacan, Texcoco y Chalco. Patrones de Desarrollo Urbano. Revision Historica del Crecimiento de la Zona Nor-oeste -NZT- del Area Metropolitana, Naucalpan Edo. de Mexico. Planos.

The matrix illustrates the approximate availability of community facilities, utilities, and services in the 12 dwelling environments. Three levels are indicated as follows:

- *No provision at all*
- *Limited or occasional*
- *Adequate or normal*

The matrix clearly indicates that the level of service availability is directly related to the dwelling environment location, and in a way it also reflects the population's income level.

Cases 2,3, 4 and 1 rate "none" and "limited." These cases are respectively subdivisions located in the periphery and a shantytown of the inner ring. The cases range from very low to low income levels.

Cases 5, 6 and 7, 8, 9 rate "limited" and "adequate" in their community facilities and services. These cases are, respectively, subdivisions located in the intermediate ring and central area tenements. Their population ranges from low to moderately-low income levels.

Finally, the cases 10, 11, 12 rate mostly "adequate." They have no particular location: central areas, intermediate ring or periphery. The population living in Public housing are mostly from moderate-low to middle income groups.

The following comments were withdrawn from the twelve case studies and are arranged in terms of location and housing systems.

PERIPHERY:
The recently developed colonias proletarias nuevas have "no" access to fire protection, health, sewerage, storm drainage and refuse collection; a "limited" access to police, schools, water, gas (tank), public transportation and telephone. However, electricity and street lighting is widely available in these localities. (see JALALPA, LOMAS DE SAN AGUSTIN, and NETZAHUALCOYOTL)

INTERMEDIATE RING:
The ciudad perdida ranks with "none" and "limited" service supply. They are relatively close to the city center and therefore have "adequate" access to health centers, schools and public transportation. Being a very low income quasi-legal settlement, the population does not have the economic means to improve their immediate environment, and lack of water, sewerage, storm drainage, paved roads and recreation areas. Other services are provided nearby, which are "limited" in community's use: police, fire protection, electricity and telephone. (see BUENOS AIRES)

The already urbanized colonias proletarias viejas rate "limited" availability in fire protection, health centers and recreation or open areas. The normally rate "adequate" service of water, sewerage, storm drainage, electricity and street lighting, police, schools, gas (tank), refuse collection, public transportation, paved roads and telephone. (note: PRO-HOGAR, VALLEJO)

CENTRAL AREA:
The vecindades, because of their central location have "adequate" access to police protection, fire protection, health centers, schools, water, sewerage, storm drainage, electricity and street lighting, gas (tank), refuse collection, public transportaion, and paved roads. They have "limited" access to telephones, and because of the highly dense built up area, they lack open recreational facilities. (see Tepito's: CASA GRANDE, LA FLORIDA, LAS VIZCAINAS)

Public housing projects are instantly built as packages, that normally include most services, utilities and facilities which are provided along the dwelling units and their environment. Only fire protection is "limited," but that is common in all the Metropolitan Area. Note that conjuntos are the only housing system with "adequate" recreational areas. (see: SAN JUAN DE ARAGON, IZTACALCO, NONOALCO-TLALTELOLCO)

2. PHYSICAL DATA MATRIX

Category	Population Per Category	% of Total Population	LOCALITIES	1 USER: Income (Very low / Low / Moderate low / Middle / High)	1 USER: Size (Household Members)	2 DWELLING UNIT: Type (Shanty / Room / Apartment / House)	2 DWELLING UNIT: Net Area m2	3 LAND/LOT: Utilization (Public / Semi-Public (%) / Semi-Private / Private)	3 LAND/LOT: Gross Area m2	4 DWELLING CHARACTERISTICS: Location (City Center / Inner Ring / Periphery)	4 DWELLING CHARACTERISTICS: Type (Detached / Semi-Detached / Row/Grouped / Walk-up / High-rise)	4 DWELLING CHARACTERISTICS: No. Floors (1 / 2 / 3 or more)	4 DWELLING CHARACTERISTICS: Utilizat'n (Single / Multiple)	4 DWELLING CHARACTERISTICS: Physical State (Bad / Fair / Good / Very Good)	5 DWELLING DEVELOPMENT: Mode (Incremental / Instant)	5 DWELLING DEVELOPMENT: Developer (Popular / Private / Public)	5 DWELLING DEVELOPMENT: Builder (Self-Help / Artisan / Small Contractor / Large Contractor)	5 DWELLING DEVELOPMENT: Construct'n Type (Shack / Wood / Block/Cardboard / Masonry/Wood / Masonry/Concrete / Concrete)	5 DWELLING DEVELOPMENT: Date (Year of Construction)	5 DWELLING DEVELOPMENT: Density (People/Hectare)	6 INDICATORS: Dwelling (Constructed Area m2 Per Person)	6 INDICATORS: Lot (Net Lot Area m2 Per Person)	6 INDICATORS: Coverage (% Constructed Area Of Lot Net Area)	Locality
A	0.200m.	2.3	1. Buenos Aires		6-8-10		28	8 - 20	72 6330											1945	750	3-4	3-5	90	1
			2. Jalalpa		6-8		50	23 - -	77 260											1971	200	6-9	25-34	25	2
			3. Lomas San Agustin		8-10		64	24 - -	76 264											1967	330	6-8	20-25	32	3
B	2.300m.	26.7	4. Netzahualcoyotl		6-8		100	33 - -	67 215											1964	166	12-17	18-24	69	4
			5. Pro-Hogar		7-8		135	29 - -	71 285											1945	410	16-19	22-29	68	5
C	1.000m.	11.7	6. Vallejo		6-7		90	23 - -	77 260											1940	423	12-15	15-19	82	6
			7. Las Vizcainas		6-8		96	19 - -	81 21300											1734	233	12-16			7
			8. Tepito Casa Grande		6-8		22	23 -	22 55 9400											1910	796	2-4	6-9	42	8
D	2.000m.	23.2	9. Tepito La Florida		6-8		26	8 -	22 70 1696											1900	850	3-5	4-6	76	9
			10. San Juan de Aragon		4-6		64	34 - -	66 288											1964	175	11-16	33-50	32	10
			11. Iztacalco		4-6		80	35	40 - 25 NA											1973	433	13-20	12-20	25	11
E	0.500m.	5.8	12. Nonoalco Tlaltelolco		4-5-6		74	36	51 - 13 NA											1966	711	12-19	10-15	13	12
	6.000m.	69.5	TOTAL	Note: NA=Not Applicable																					
	30.5		Middle-High Income																						
	8.634m.	100.0	TOTAL METROPOLITAN POPULATION																						

SOURCES:

- *Bazant J. et al.(1974), Urban Dwelling Environments... op.cit.,p.136,140,141.*
- *Turner J.F.C.(1973), Analisis,Diagnostico y Evaluacion del Sistema General de Vivienda de los Sectores de Bajos Recursos en el Area Metropolitana de Ciudad de Mexico, Cambridge-Mexico City, Oficina del Plano Regulador DDF, p.154-B*
- *Direccion de Catastro e Impuesto Predial DDF (1970), Blocks and segments' cadastre plans. Case studies 1,2,5,6,7,8,9,10,11,12. (see Sources of Plans)*
- *Departamento de Catastro. Gobierno del Estado de Mexico (1974), Blocks and segments' cadastre plans. Case studies 3,4. (see Sources of Plans)*

The twelve case studies have been grouped according to their housing system and income level.

	INCOME	HOUSING SYSTEMS	CASES
VL	VERY LOW	CIUDADES PERDIDAS	1
L	LOW	COLONIAS NUEVAS	2, 3, 4
L/ML	LOW/MODERATE-LOW	COLONIAS VIEJAS	5, 6
L/ML	LOW/MODERATE-LOW	VECINDADES	7, 8, 9
ML/M	MOD.LOW/MIDDLE	CONJUNTOS	10, 11, 12

The first four housing systems are representative dwelling environments of the majority of Metropolitan population (64%), while Public subsidized housing represents 6% of the population. The following is a description of the research information contained in the data matrix:

1. USERS

1.1 HOUSEHOLD SIZE - DENSITY

Each housing system is a representative stage of population's socio-economic development; and each has particular characteristics regarding the household's size and the intensity of environment's use.

Population densities are intended as indicators for each dwelling group. Therefore, samples were taken from selected homogeneous areas that include the land of a dwelling group and their circulation access.

In general, lower income households are larger in size, as a way of distributing among many, their housing/living expenditures. They live in compact high density environments. As income increases and households' economy stabilizes, it is observed that they tend to decrease in size and be economically independent, since they need less from peers and community.

T. 7: AVERAGE HOUSEHOLD SIZE. HOUSING SYSTEMS DENSITY.

		HOUSEHOLD (PERSONS)	DENSITY (PERS./HS.)
VL	CIUDADES PERDIDAS	6, 8, 10	600 - 800
L	COLONIAS NUEVAS	6, 8, 10	100 - 300
L/ML	COLONIAS VIEJAS	6, 8	300 - 600
L/ML	VECINDADES	6, 8	700 - 900
ML/M	CONJUNTOS	4, 6	100 - 800

SOURCE: BAZANT J.,CORTES JL, DAVILA R,ESPINOSA E, "URBAN DWELLING ENVIRONMENTS IN MEXICO CITY", USDF, MIT, 1974, P. 140-141.

Due to dwellings size limitation, the lower income population living in cuidades perdidas and vecindades have the highest densities. Ciudades are mostly formed by "extended" families, which include peers and relatives. Vecindades are more characterized for having smaller size households--nuclear families mainly--but who have kinship relations with other community members. Densities in vecindades are normally higher because downtown areas are compact dwelling environments, whereas the ciudades appear sporadically in the inner city's vacant lots.

The colonias nuevas have low densities due to their recent implementation and because a high percentage of lots are still vacant. Households tend to be younger and larger, normally including relatives as members.

The colonias viejas have medium densities, since the majority of lots are constructed, most for residential purposes. Households are nuclear and average in size (5-6 members).

Public housing has densities according to housing type. Row housing projects have low to medium densities, walk-up apartments medium densities and high rise buildings have high densities. Household size averages 4-6 members.

2. DWELLING UNIT TYPE:

The type of dwelling and it's area are characteristics which correlate with populations' income level and their housing systems. These are as follows:

T. 8: DWELLING UNIT TYPE AND AREA.

	HOUSING SYSTEMS	TYPE	NET AREA (M2)
VL	CIUDADES PERDIDAS	SHANTY	20 - 30
L	COLONIAS NUEVAS	UNFINISHED HOUSE	50 - 150
L/ML	COLONIAS VIEJAS	HOUSE/APARTMENT	75 - 150
L/ML	VECINDADES	ROOM/APARTMENT	20 - 50
ML/M	CONJUNTOS	HOUSE/APARTMENT	50 - 100

SOURCE: BAZANT J. ET AL., URBAN DWELLING ENVIRONMENTS ... OP.CIT., P.20,30,44,56,66,76,86,96,100,110,120,132.

The ciudad perdida typical shanty consist in a 1 or 2 room shack. (BUENOS AIRES) Also downtown vecindades have limited area and usually consist of one room apartments with sleeping loft. (LAS VIZCAINAS, CASA GRANDE, LA FLORIDA)

In colonias proletarias nuevas houses are smaller since they are in early construction stages, but have gradually expanded from one room. (JALALPA, L.SAN AGUSTIN, NETZAHUALCOYOTL) Old colonias are typified by conventional apartments and by houses that have reached full expansion. Houses and apartments have several bedrooms and service areas. (PRO-HOGAR, VALLEJO)

The conjuntos dwelling packages have conventional areas that vary according to the number of bedrooms. They have as well several rooms and service areas. (S.J.ARAGON, IZTACALCO, NONOALCO)

3. LAND/LOT

3.1 LAND UTILIZATION:

Land utilization is used to evaluate the physical efficiency of urban layouts. Each housing system has particular land use characteristics.

Basically land utilization is taken as an indicator to analyze the relation of areas used for dwelling purposes, in comparison with areas utilized for circulation or recreational facilities. In this case, to the private use areas, were added semi-private areas which are those under private control but of common use, like courts or walkways. To the public use areas--circulation, parking, recreation--were added the semi-private use areas, like community facilities.

T. 9: LAND UTILIZATION PATTERN.

	PRIVATE SEMI-PRIVATE (%)	PUBLIC SEMI-PUBLIC (%)
CIUDADES PERDIDAS	90 - +	10 - -
COLONIAS NUEVAS	60 - 80	40 - 20
COLONIAS VIEJAS	70 - 80	30 - 20
VECINDADES	80 - 90	20 - 10
CONJUNTOS	10 - 70	90 - 30

SOURCE: BAZANT ET AL., URBAN DWELLING ENVIRONMENTS... OP.CIT., P. 140-141.

Land in ciudades perdidas is almost under total control of its community. In fact, communities are practically isolated from the urban context, since their accessibility is limited. 90% and more of total area is used for dwelling purposes.

The colonias proletarias nuevas have low land control, since urban layouts generally provide too small lots for such a large circulation area. As much as 30%-40% of total area is utilized for public purposes.

The old colonias have similar layout characteristics as the new colonias. Population living in this housing system has little control over their urban environment.

Vecindades have a high 80%-90% of lot's area for private use. Tenants have control not only over their own dwelling but also over common courts. Even maintenance of semi-private use area is generally undertaken by tenants themselves.

Public housing has a variety of land use patterns according to project type. Row housing projects have similar layout efficiency as colonias, but projects devote larger areas for community facilities. In row housing 60%-70% of total area is for private use. High rise projects have the lowest percentage of private use land, since most areas are dedicated for public use purposes. Dwellers have no responsibility over their environment and do not participate in its maintenance. In high rise projects, private land use represents only 10% of total area.

3.2 NET AREA/GROSS AREA:

The area of lots (in the case of subdivisions) and the attributed area of dwellings (in the case of apartments)depend on their urban layout and their land utilization. Table 10 shows the dwellings representative land areas:

T. 10: LAND/LOT NET AREA. GROSS AREA PER DWELLING.

	NET AREA (M2)	GROSS AREA (M2)
CIUDADES PERDIDAS	20 - 30	25 - 50
COLONIAS NUEVAS	120 - 250	150 - 350
COLONIAS VIEJAS	150 - 300	150 - 500
VECINDADES	20 - 40	30 - 80
CONJUNTOS	50 - 200	70 - 400

SOURCES: BAZANT J., ET AL., URBAN DWELLING ENVIRONMENTS,... OP.CIT. P. 18,28,38,54,64,74,82,94,96, 108,118,128.

The dwellings' land net areas were estimated by dividing the property's private and semi-private use areas by the number of dwellings in the lot. The dwellings' gross areas include the property's net area plus its attributed public and semi-public use areas. The gross area is then divided by the number of dwelling units in the lot. Rental and apartment accommodations have obviously smaller land areas per dwelling unit than subdivisions. Gross areas have been used to analyze the urban environment land utilization while net areas were used in the appraisal of dwellings.

4. DWELLING CHARACTERISTICS

4.1 LOCATION:

The city center is mostly occupied by very low to moderately-low income groups (BUENOS AIRES, LAS VIZCAINAS, CASA GRANDE, LA FLORIDA) which have more access to services and facilities. The intermediate ring is mostly occupied by moderately-low income groups (PRO-HOGAR, VALLEJO, SAN JUAN DE ARAGON) and some middle and high income groups. The periphery is mostly occupied by low income groups (JALALPA, L. S. AGUSTIN, NETZAHUALCOYOTL), although some middle and high income residential areas are also found in the periphery.

4.2 DWELLING TYPES:

The row group dwelling types are found throughout the income spectrum from ciudades to colonias proletarias and in some Public housing projects. (S.J. ARAGON) In some newly built colonias the houses are detached initially (JALALPA, L.S. AGUSTIN, NETZAHUALCOYOTL), but as the construction process advances they become row houses. (PRO-HOGAR) Tenements included under row/group provide housing to city's center of activities. Walk-up and high rise apartments are both built by the private and Public sector.

4.3 DWELLING FLOORS:

Most dwellings are generally single floor units in all income groups. Walk-up apartments are accepted as land values increase. High rise units are provided on a limited scale for upper-low, middle and high income groups.

4.4 DWELLING UTILIZATION:

Single occupancy is the form of colonias proletarias' row/group housing and in some Public housing projects. Multiple dwelling occupation is the form of ciudades perdidas, vecindades and walk-up apartments.

4.5 PHYSICAL STATE:

The pattern of physical state is as follows: bad states are found in very low and moderately-low incomes, particularly in ciudades and vecindades. Fair state is generally found in low income groups colonias and good physical state is typical of Public housing cases.

5. DWELLING DEVELOPMENT

5.1 DEVELOPMENT MODE:

Incremental mode is commonly used by very low to moderately-low income groups, from ciudades perdidas to colonias proletarias. Instant development is typical of downtown tenements, walk-up apartments and Public housing.

5.2 DEVELOPER:

The "popular" development is generally found in lower income groups, particularly in ciudades and colonias, since population lacks of financial resources and undertakes own construction process. The "private" sector deals with land subdivisions and housing for low as well as for higher income groups; meant for profit making. The "Public" sector is concerned with subsidized package dwellings for upper-low and middle income groups.

5.3 DWELLING BUILDER:

The building pattern is withdrawn from the case studies: self-help methods are used by very low income groups to build their own environments, like ciudades perdidas and early construction stages of colonias proletarias. Artisans are generally employed to complete dwellings. Small contractors are hired by middle/high income groups to construct apartment buildings or individual houses. The Public sector usually employs large contractors in the construction of their projects.

5.4 CONSTRUCTION TYPES:

Shacks are common of very low income groups and represent approximately 8% of Metropolitan dwellings. (IMSS 1967:52) Masonry/wood is typical of old vecindades and colonias proletarias, both of which cover 19% of city's dwellings. The most used construction materials are masonry and concrete, which count for approximately 73% of Metropolitan houses. (SIC 1971:227) These are typical of dwellings' latter construction stages in colonias and some Public housing projects, mainly row and walk-up buildings. Concrete construction is being used in large housing projects--especially in high rise buildings.

5.5 YEAR OF CONSTRUCTION:

The oldest case study is LAS VIZCAINAS, located in the city center. It was built during the Spanish colonial time. After, the downtown vecindades date from the first decades of this century. Old colonias are typical of the urban sprawl resulted from industrialization of Mexico City in the 1940's and 1950's. Some ciudades are also from that period. The case studies representing the newest type of urban sprawl--mainly resulting from massive migration currents--are the colonias nuevas. Although institutionalized in 1925 (SHCP 1964), not until last decade the Public sector has managed to launch large housing projects.

6. INDICATORS

6.1 CONSTRUCTED AREA PER PERSON:

Household's size and dwelling's area determine the living conditions of population. The following table shows the attributed dwelling area per household member.

T. 11: INDICATORS: DWELLING AREA PER PERSON.

	NET AREA (M2)	HOUSEHOLD SIZE (PERSONS)	IND. (M2/PERS.)
CIUDADES PERDIDAS	20 - 30	6, 8, 10	2 - 4
COLONIAS NUEVAS	50 - 150	6, 8, 10	5 - 20
COLONIAS VIEJAS	75 - 150	6, 8	10 - 20
VECINDADES	20 - 50	6, 8	2 - 5
CONJUNTOS	50 - 100	4, 6	10 - 20

SOURCE: BAZANT J., ET AL., URBAN DWELLING ENVIRONMENTS..., OP.CIT., P. 20,30,44,56,66,76,86,96,98,100,118,120,121,132.

Ciudades perdidas and vecindades have the lowest dwelling area per person of the entire housing system, since households are large in comparison with dwelling's reduced areas.

The only low income housing system that provides "standard" area per person are the old colonias whose dwellings are spacious for such household size.

New colonias instead, have a below "standard" ratio since dwellings are still in construction process and the household must live in few rooms.

Public housing projects observe the "standard" area per person requirement (12 m2). Also family sizes are smaller and have a normal occupancy of 2 persons per bedroom.

6.2 LAND/LOT AREA PER PERSON:

The relation that persons have with their dwelling and lot are important indicators of the (attributed) living space that household members have. In apartment cases, land area per dwelling unit is obtained by dividing

the lot area (or the building's attributed land area) by the number of dwellings or households. The subdivision case studies have only one household per lot. The following figures show the ratio of land area per household member:

T. 12: INDICATORS: LAND/LOT AREA PER PERSON.

	LAND NET AREA (M2.)	HOUSEHOLD SIZE (PERSONS)	IND. (M2/PERS.)
CIUDADES PERDIDAS	20 - 30	6, 8, 10	3 - 10
COLONIAS NUEVAS	120 - 250	6, 8, 10	15 - 40
COLONIAS VIEJAS	150 - 300	6, 8	10 - 30
VECINDADES	20 - 40	6, 8	3 - 15
CONJUNTOS	50 - 200	4, 6	10 - 50

SOURCE: BAZANT J. ET AL., URBAN DWELLING ENVIRONMENTS..., OP.CIT., P.18,28,38,54,64,74,82,94,98,108,118,128.

The ciudades perdidas and vecindades fall in similar land/lot per person range, meaning that besides their low dwelling area, courts or common spaces result very limited.

The old and recent colonias have also similar lot area per person, since layout land utilization and lot sizes are within the same area range.

In Public housing, land/lot area per person varies according to the type of project. Row housing can give as high as 50 m2 lot area per person, resulting from its low density and individual lots per household. In high rise projects however, land area per person decreases to 10 m2 because of high densities. Walk-up apartment projects normally have 20 m2 to 30 m2 land area per person.

6.3 COVERAGE RATIO:

Each low income housing system has a peculiar urban morphology, which reflects the relation of dwelling's covered area with the open areas that surround them. The relation of dwellings' net constructed areas with their attributed gross areas (semi-private, public, semi-public use areas) are as follows:

T. 13: INDICATORS: COVERAGE RATIO.

	DWELLING NET AREA (M2)	LAND/LOT GROSS AREA (M2)	COVERAGE (%)
CIUDADES PERDIDAS	20 - 30	25 - 50	90 - +
COLONIAS NUEVAS	50 - 150	150 - 350	30 - 60
COLONIAS VIEJAS	75 - 150	125 - 500	60 - 80
VECINDADES	20 - 50	30 - 80	80 - 90
CONJUNTOS	50 - 100	70 - 400	- - 30

SOURCE: BAZANT J. ET AL., URBAN DWELLING ENVIRONMENTS..., OP.CIT., P.18,28,38,54,64,74,82,94,96, 108,118,132.

Land coverage extreme case is found in ciudades where 90% or more of the shantytown land is covered, leaving the rest as interior walkways.

Recent colonias have initially a low coverage ratio, because dwellings are at early construction stages. The ratio tends to increase as dwellings expand.

The full expanded dwellings of old colonias have a medium coverage ratio, because their urban layout has large public areas.

Vecindades have high coverage ratio. That is only a small proportion of areas are left for circulation or common areas. The ratio is static since constructions cannot expand more.

Finally, Public housing represents the lowest coverage ratio in the housing system. Only up to 30% of land is utilized for housing construction and the remaining is left for public and semi-public use. Walk-up housing has a coverage ratio of 20%. Ratio drops to 10% in high rise projects. The coverage ratio is related to the project's land utilization.

3. ECONOMIC DATA MATRIX

Category	Population per Category	% of Total Population	LOCALITIES	1 USER: Income — Households Annual Income Range ($)	1 USER: Exp/Rent — Annual Gross Expenditures ($)	1 USER: Expenditures of Income (%)	1 USER: Number — People Living in Land/Lot (#)	2 DWELLING UNIT: Number — Units in Land/Lot (#)	2 DWELLING UNIT: Const'n Value — $/Cadastre m2	2 DWELLING UNIT: Const'n Value — $/Commercial m2	2 DWELLING UNIT: Ratio — Cadastre to Commercial (R)	2 DWELLING UNIT: Tenure — Rental Ownership	3 LAND/LOT: Net Area — Total Area of Land/Lot m2	3 LAND/LOT: Land Value — $/Cadastre m2	3 LAND/LOT: Land Value — $/Commercial m2	3 LAND/LOT: Ratio — Cadastre to Commercial (R)	3 LAND/LOT: Tenure — Extralegal:Rent Extralegal:Owner Legal:Rental Legal:Ownership	4 DWELLING UNIT VALUE: Dwelling ($)	4 DWELLING UNIT VALUE: Dwelling (%)	4 DWELLING UNIT VALUE: Land ($)	4 DWELLING UNIT VALUE: Land (%)	4 DWELLING UNIT VALUE: Total ($) 100.0%	5 OPERATING EXPENSES: Maintenance — No Low Average High	5 OPERATING EXPENSES: Services — No Low Average High	5 OPERATING EXPENSES: Taxation — Not Taxed Taxed Tax Exempt	5 OPERATING EXPENSES: Financing — Self-Financed Mortgage/Loan	6 INDICATORS: Property — Capitalization Rate (%)	6 INDICATORS: Value — Value per Person ($)	6 INDICATORS: Ratio — Income to Value (R)	Locality
A	0.200m.	2.3	1. Buenos Aires	-432	102	25	1150	189	NA	0	-		5821	36	38	1.05		-	-	1170	100.0	1170					9	147	1:2.7	1
			2. Jalalpa	432-720	180	25	6	1	TE	10	-		200	5	8	1.6		500	23.8	1600	76.2	2100					20	350	1:2.9	2
			3. Lomas San Agustin	432-960	240	24	8	1	NT	12	-		200	8	12	1.5		768	24.2	2400	75.8	3168					18	396	1:3.3	3
B	2.300m.	26.7	4. Netzahualcoyotl	720-1200	288	23	6	1	NT	16	-		144	13	18	1.4		1600	38.2	2592	61.8	4192					15	699	1:3.5	4
			5. Pro-Hogar	1920-2400	432	18	7	1	17	22	1.3		200	25	32	1.3		2970	31.7	6400	68.3	9370					12	1339	1:3.9	5
C	1.000m.	11.7	6. Vallejo	1296-1920	336	17	26	4	30	36	1.2		200	23	29	1.3		3240	69.1	1450	30.9	4690					7	782	1:2.4	6
			7. Las Vizcainas	1440-1680	132	8	550	58	TE	NA	-		17254	90	100	1.1		-	-	-	-	-					-	-	-	7
			8. Tepito Casa Grande	1440-2160	168	8	964	157	6	6	1.0		7249	36	38	1.05		132	7.0	1754	93.0	1886					10	314	1:0.9	8
D	2.000m.	23.2	9. Tepito La Florida	1296-1680	144	9	253	46	4	4	1.0		1554	42	43	1.03		104	6.7	1452	93.3	1556					11	259	1:0.9	9
			10. San Juan de Aragon	2640-3120	420	13	4	1	TE	48	-		190	21	24	1.2		3072	40.2	4560	59.8	7632					12	1908	1:2.5	10
			11. Iztacalco	2880-3600	476	11	6	NA	TE	68	-		77*	N	36			5440	66.2	2772	33.8	8212					7	1369	1:2.3	11
E	0.500m.	5.8	12. Nonoalco-Tlaltelolco	2640-3360	504	15	5	NA	TE	92	-		50*	48	52	1.1		6808	72.4	2600	27.6	9408					6	1881	1:2.8	12
	6.000m.	69.5	TOTAL																											
		30.5	Middle-High Income																											
	8.634m.	100.0	TOTAL METROPOLITAN POPULATION																											

Note: NA=Not Applicable, N=Not Available, TE=Tax Exempt, NT=Not Taxed, (*)=Attributed Area per Apartment.

SOURCES:

- *Hipotecaria Bancomer SA (1974), Album de Valores de la Propiedad, Mexico DF.*
- *Direccion de Catastro e Impuesto Predial (1970), Cuadro de Tipos de Edificaciones y sus Valores por Metro Cuadrado, Tesoreria del DDF, Mexico DF.*
- *_____ (1970), Album de Valores Unitarios para la tierra en la Ciudad de Mexico y Zonas Urbanas del DF, Tesoreria del DDF, Mexico DF.*
- *Bazant J. et al. (1974), Urban Dwelling Environments...op.cit.,p.136*
- *Turner J.F.C. (1973), Analisis, Diagnostico y Evaluacion...op.cit., p.154-A*
- *Bartlett C.(1965), Assessing and the Appraisal Process, Chicago Ill., International Ass. of Assessing Officers, p.14-45*
- *Economic Valuation Matrix: Net Income*

1. USERS

1.1 INCOME:

Each housing system has particular socio-economic characteristics and magnitude regarding the population that represents them; as the following table indicates:

T. 14: METROPOLITAN MEXICO: INCOME DISTRIBUTION BY HOUSING SYSTEM IN 1970.

		SUBSISTENCE (S)	INCOME ($)	POPULATION MILLION	(%)
VL	CIUDADES PERDIDAS	- S	- 432	0.200	2.3
L	COLONIAS NUEVAS	S - 3S	432 - 1296	2.300	26.7
L/ML	COLONIAS VIEJAS	3S - 6S	1296 - 2592	1.000	11.7
L/ML	VECINDADES	3S - 8S	1296 - 3456	2.000	23.2
	LOW INCOME POPULATION:			5.500	63.7
ML/M	CONJUNTOS	6S - 12S	2592 - 5184	0.500	5.8
	POPULATION REPRESENTED:			6.000	69.5
M	MIDDLE INCOME	8S - 22S	3456 - 9600	2.460	28.5
H	HIGH INCOME	22S - +	9600 - +	0.174	2.0
	METROPOLITAN POPULATION:			8.634	100.0

SOURCE: BAZANT J. ET AL., URBAN DWELLING ENVIRONMENTS... OP.CIT.,P.136. TURNER JFC, ANALISIS, DIAGNOSTICO Y EVALUACION..., OP.CIT., P.154 A, 154 B. TURNER JFC, NOTES FOR A HOUSING POLICY..., OP.CIT., SECTION II, CHART C, OPP.P.II-4 AND II-5.

Households living in ciudades perdidas represent the lowest income group of Metropolitan population. Their income was defined as the "subsistence level," which was taken as an income unit for the comparative analysis of different socio-economic groups.

The "subsistence level" has been defined as the minimum income required by an average 6 member household to cover their basic needs of food and housing. For Metropolitan Mexico, the subsistence income was defined at $432 per year at 1970-71 prices. (Turner 1973:3) It is worth noting that Mexico City's Official minimum wage for 1970-71 was $2.50/day or approximately $800 annually, which was predominantly earned by semi-skilled workers of employees. (Germidis 1974:68) Normally the "Official Commission on Minimum Wages" readjusts salaries every two years, but due to inflation was compelled to readjust wages three times since 1971. By the turn of 1975, minimum wages had almost doubled.

In 1970-71, the "subsistence level" (S) was approximately half the minimum stipulated wage. Considering that lower income groups (unskilled without permanent employment) did not benefit from salary increases, it then may be assumed that the gap between wages and subsistence income is increasing. This suggests that lower income groups' actual possibilities for obtaining employment (and benefits) is decreasing.

The population in new colonias proletarias is defined at incomes from S to 3S subsistence level. Some are incorporated into the economic system through employment, and others who lack skill manage to subsist through informal employment--street vendors, and so on.

The population of old colonias are predominantly workers/employees who have already learned a skill and are consequently improving their economic position. Its households are moderately-low income, at 3S to 6S subsistence levels. They normally have permanent employment and are stable economically.

Vecindades have a variety of income groups, from 3S to 8S subsistence levels. The lower income groups are formed by unskilled or semi-skilled newcomers who usually work temporarily in nearby markets or manufacturing shops. Lower income groups definitely need a proximity to employment sources. Moderate-low income groups could afford better living conditions perhaps outside the tenements. But they stay in tenements for convenience, since most of them have permanent employment.

The population of Public housing is considered upper-low to middle income. These groups are formed by skilled workers, technicians, professionals,...all of whom have permanent employment.

1.2 SOCIO-ECONOMIC MOBILITY:

Low income groups represent the majority of urban population and they may be characterized and defined in terms of their economical mobility. The economic difference between income groups is significant especially at lower levels, where money is tighter and population has fewer opportunities of improving their economic position.

The low income population is basically formed by old and recent generations of rural migrants, who strive to incorporate into the urban economy. Turner hypothesized low income population's economic mobility tendencies as follows:

T. 15: METROPOLITAN MEXICO: SOCIO-ECONOMIC MOBILITY IN 1970.

		POPULATION (MILLIONS) DOWNWARD	STATIC	UPWARD	TOTAL
VL	CIUDADES PERDIDAS	-	0.15	0.05	0.20
L	COLONIAS NUEVAS	0.30	1.85	0.15	2.30
L/ML	COLONIAS VIEJAS	-	0.90	0.10	1.00
L/ML	VECINDADES	-	1.75	0.25	2.00
ML/M	CONJUNTOS	-	0.40	0.10	0.50
	METROPOLITAN POPULATION:	.30	5.05	0.65	6.00
	(%) OF POPULATION:	3.5	58.5	7.5	69.5

SOURCES: TURNER JFC, NOTES FOR A HOUSING POLICY...,OP. CIT., SECTION II, CHART G, OPP.P.II-11.

Approximately 60% of the Metropolitan population remains "static" in their economic tendency.

The "downward" economic tendency is represented by low income groups that live in new colonias. This population is young primarily and having recently settled is still struggling to incorporate into the monetary system.

The "upwardly" mobile tendency is small in proportion with the massive economically static population. This is composed by individuals who are integrated into the economic structure and obtain income increases.

1.3 HOUSING PAYMENTS:

It is observed that households' income relates to housing expenditures following two basic patterns: a) the lower the incomes, consequently the lower the housing expenditures; and b) the lower the incomes, the higher the percentage of income that is derived for housing expenditures.

T. 16: ANNUAL EXPENDITURES ON HOUSING. (RENTS OR AMORTIZATIONS)

	HOUSING SYSTEMS	ANNUAL EXPENSES	(%) OF INCOME
VL	CIUDADES PERDIDAS	- - 100	25 - +
L	COLONIAS NUEVAS	150 - 300	20 - 25
L/ML	COLONIAS VIEJAS	300 - 450	15 - 20
L/ML	VECINDADES	100 - 200	5 - 15
ML/M	CONJUNTOS	400 - 500	10 - 20

SOURCE: BAZANT J. ET AL., URBAN DWELLING ENVIRONMENTS... OP.CIT., P.20,30,44,56,67, 77,85,98,100,110,121,130. TURNER JFC (1973) ANALISIS, DIAGNOSTICO Y EVALUACION...OP.CIT. P. 154 A, 154 B. BROWN JC, PATTERNS OF ... OP.CIT. P.188,103. TURNER JFC (1971), NOTES FOR A HOUSING POLICY... OP.CIT..P.II-4.

The lowest housing expenditures are payed by very low income groups living in ciudades perdidas. However, they spend 25% of their income and more on housing, which is the highest percentage of Metropolitan housing. This income group is economically unstable, since incomes are likely to remain at subsistence level (due to lack of skill) and housing expenditures are tending to increase. Households are obliged to continue paying high housing expenditures in order to keep their location which is vital for their subsistence.

Also, the population in new colonias allocates a high proportion of their income for housing expenditures. Households have very limited savings capacity, because they are amortizing their lot and investing on dwelling construction. Since households do not have funds available, they risk to lose property by default when an emergency arises.

The population living in old colonias have the largest housing expenditures; yet as a percentage of income expenditures, they are relatively low. Households are investing little on housing, since dwellings are already completed. In general, this income group is saving and in a better position to meet casualties without risking their properties.

Tenants in vecindades pay rents that are below their economic capacity. Consequently they are saving from rents. Lower income tenants pay a higher proportion of income on rents and are not saving. Tenants are usually better off than any other group in the low income housing market; paying low rents for small but serviced accommodations with excellent locations. This is why downtown areas have been saturated for a long time.

The conjuntos are predominantly formed by upper-low income groups who spend 15% to 20% of their income on housing. This income group is economically solvent. Although they may not "save" from housing expenditures, they are eligible to credit when in need. Also, Public agencies ease the economic burden on purchasers by offering the most convenient financing plans.

1.4 DWELLERS/DWELLINGS PER LAND/LOT:

The number of people that live within a lot, depend upon the dwelling's type and tenure. In land subdivisions, presumably one household occupies one lot, as in the case of colonias proletarias and conjuntos' row housing. Here households seek land ownership. In the rental accommodation cases--vecindades and ciudades perdidas--households share with others the use of property. A combination of

both tenure types, is found in condominiums--like walk-ups--where households own their dwelling, but still share common areas of the property. Usually, properties that are held on rent have one owner, while properties held in condominiums have several. Both cases deal with private property, therefore people and dwellings may easily be registered.

But the number of dwellings or households per "lot" in Public housing's walk-ups or high rise buildings are difficult to determine, since land is public. Special considerations should be made to obtain the desired information, and vary according to project.

2. DWELLING UNIT

2.1 DWELLING UNIT CONSTRUCTION VALUES:

Some considerations are initially made regarding low income housing construction values. The available information on construction costs is only useful in determining the value of "recent" buildings; but is of doubtful use in studying precarious low income settlements. The most reliable source for determining the construction values of different low income housing situations are the commercial mortgage banks, since they valuate property through appraisal. The "Departamanto de Avaluos y Estudios Economicos" of "Hipotecaria Bancomer S.A." offered the technical support which complemented this part of the analysis. Its personnel have enough experience and information to determine the commercial values of unfinished dwellings at different stages of completion, old tenements and old houses.

The cadastre's "Construction Value Album" (used for taxation purposes) offers basic information on construction-cost parameters of different building types and ages according to their materials, quality and physical state.

It is considered helpful to establish the relation between cadastre and commercial construction values. It was found that contrary to land values, there was no significant difference between them. The commercial values are higher than cadastre values as the following indicators show:

T. 17: CADASTRE/COMMERCIAL CONSTRUCTION VALUE RATIO IN 1970.

	HOUSING SYSTEMS	RATIO
VL	CIUDADES PERDIDAS	N.A.
L	COLONIAS NUEVAS	N.A.
L/ML	COLONIAS VIEJAS	1.2
L/ML	VECINDADES	1.0
ML/M	CONJUNTOS	N.A.

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES... OP.CIT. DIRECCION DE CATASTRO E IMPUESTO PREDIAL DDF,"CUADRO DE TIPOS DE EDIFICACION Y SUS VALORES POR METRO CUADRADO", TESORERIA DEL DDF, 1970.

Downtown tenements have similar commercial cadastre values since constructions are deteriorated or in precarious conditions. In old colonias commercial values are up to 20% higher than cadastre construction values, since dwellings having services tend to appreciate. Unfinished dwellings in new colonias and shanties are not considered in the "Cadastre Album;" nor is Public housing which is tax exempt.

It should be emphasized that values in this analysis only reflect the low income housing market, and therefore do not relate to any profit making type of construction. The following table summarizes construction values and constructed area ranges for each housing system:

T. 18: COMMERCIAL CONSTRUCTION VALUES. 1970. CONSTRUCTED AREA PER DWELLING.

	ESTIMATED RANGES ($/m2)	(m2)
CIUDADES PERDIDAS	- 0	20 - 30
COLONIAS NUEVAS	8 - 20	50 - 150
COLONIAS VIEJAS	20 - 40	75 - 150
VECINDADES	0 - 8	20 - 50
CONJUNTOS	40 - 120	50 - 100

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES... OP.CIT. TABLE 10.

CUIDADES PERDIDAS:

The population living in this housing system, rents the land upon which it builds its dwellings. Land rentals are arranged under mutual "agreement" with the owner and therefore lack legal bases.

Only temporary shelters are erected in ciudades perdidas because: a) the precarious socio-economic condition of the household, and b) the extra-legal rental basis which results in dwellers' insecurity of land tenure.

Shelters are usually built by the household itself, that is by self-help, and occupy an agreed area which normally ranges from 20 m2 to 30 m2.

The materials utilized are generally from construction demolitions: bricks for walls, corrugated asphalted cardboard plates for roofs, wood poles for the roof's structure, no windows and only one door that is used for access, illumination and ventilation. Floors are compact ground. Shanties do not have any sort of construction finishings.

No private services were found in shantytowns. All of them are for communal use: pit latrines and water taps.

No values are attributed to shanties with these characteristics.

COLONIAS PROLETARIAS NUEVAS:

The construction values of colonias are low in comparison with housing market, because dwellings are at an early or intermediate construction stage.

The construction materials commonly used are: cement blocks in walls and asbestos plates or sometimes concrete in roofs. Floors are usually compact ground with a thin concrete layer as finishing. Windows are left as openings; same as doors. Frames and glass are added later.

The construction process is slow, since the breadwinner undertakes construction in his spare time and when savings are available. Sometimes households may afford temporary help and contract a mason for a specific job.

Since service supply is inadequate, most of the households built a pit latrine in the backyard, which later is adapted into a bathroom. The kitchen occupies a corner of the living-dining room until the dwelling expands and there is enough area to put it on a separate room.

Dwellings' constructed areas range from 50 m2 to 150 m2 according to their stage of completion. For example, in JALALPA, a recent development, dwellings have an average constructed area of 50 m2. In LOMAS, a mid 1960's development, dwellings have expanded to 64 m2. Finally, in NETZAHUALCOYOTL, an early 1960's development, a considerable proportion of dwellings have expanded, increasing their area to 100 m2.

The construction values are related with dwelling's completion stage. In JALALPA, dwellings are practically not more than a shelter whose attributed values are $10/m2. In NETZAHUALCOYOTL, dwellings have reached construction finishing which increase the values to $16/m2. In LOMAS, dwelling's construction was appraised at $12/m2, reflecting their intermediate construction stage. Households normally concentrate on dwelling's expansion and little on their finishings, except on those which give them security like windows and doors.

The attributed values on construction are low because: a) quality is low, and b) since dwellings have no service supply, households do not have to make costly investments on kitchen or bathroom connections nor on their furnishing.

COLONIAS PROLETARIAS VIEJAS:

The highest attributed values in housing construction were found in old colonias. Dwellings are generally more than 25 years old and have fully expanded throughout the years. With dwellings already expanded, owners allocate their resources in making dwellings more safe and comfortable.

Small construction jobs are usually handled by masons that work under household's supervision. New constructions are usually undertaken by small contractors, especially in the case of 2-3 story buildings.

Since old colonias have adequate service infrastructure, most houses have well equipped kitchens and bathrooms.

Constructed areas per dwelling are quite uniform. In PRO-HOGAR subdivision, from a 200 m2 lot normally 135 m2 are constructed. In VALLEJO, lots are larger, but are occupied by 2-3 story walk-up apartments with 90 m2 average constructed area.

The construction quality in both cases is similar, yet there is a difference in their attributed value. The difference relies on walk-up's simple reinforced concrete structure which has been appraised at $36/m2. In the other case, one story dwellings require only

load bearing walls, appraised at $22/m2. These values represent a fair construction quality, which somehow is the best among low income housing.

VECINDADES:
The lowest attributed value to dwelling's construction is found in downtown tenements. Vecindades are old, most of them for well over 50 years. Although construction materials may originally have been of fairly good quality, the lack of maintenance has run down the tenements. For materials, bricks are used for walls, reinforced concrete for roofs, metalic or wooden windows, and they are to some extent plastered and painted.

Apartments have a small toilet adapted on their entrance court. Tenants use public baths for other needs. Tenements also provide toilets and washing facilities for common use.

Vecindades have limited areas. All is crowded into one room. Regularly, tenants have adapted a sleeping loft to this one room apartment. The constructed area considering the loft is 22 m2 in CASA GRANDE and 26 m2 in LA FLORIDA.

The vecindades were built instantly by small contractors. They are in deteriorated condition. Their construction component has been appraised at $6/m2 and $4/m2 respectively.

In regard to colonial buildings in downtown areas, some have been adapted as tenements and exceptionally colonial buildings were originally built including low income apartments, as in the case of LAS VIZCAINAS.

CONJUNTOS HABITACIONALES:
The highest attributed values for housing construction are found in Public housing. This housing system can be distinguished from the above 4 mentioned because: a) Public housing stock is fairly recent, since more than half has been mass produced during the last two decades, and b) Public housing is produced as a consumer good and is offered in the market as a finished product.

The construction materials used in housing projects are low cost, but of fairly good quality: bricks for walls; reinforced concrete for roofs and structure in medium and high rise buildings; interior and exterior finishings; fully equipped bathrooms and kitchens; and so forth. Although the quality is similar, the attributed construction values vary according to the construction type. The S.J. ARAGON row housing was appraised at $48/m2. Instead, the construction component of dwellings in high rise apartments was appraised at $92/m2. IZTACALCO's construction was appraised at $68/m2.

Housing projects are constructed by large contracting companies, under the specifications and supervision of housing agencies.

Apartment sizes in Public housing range from 50 m2 to 100 m2. In row housing ARAGON, small houses average 64 m2. In IZTACALCO's walk-ups apartment areas are 86 m2, while in NONOALCO's high rise apartments average 74 m2.

2.2 DWELLING UNIT TENURE:
In the very low and low income groups three situations can be described: quasi-legal ownership is typical of ciudades perdidas and squatter settlements; rental situation is characteristic of groups with non-permanent tenure, like the downtown vecindades; and ownership is generally found in colonias proletarias.

In the moderately-low and middle income groups two situations can be found: rental situation is characteristic of apartments in old colonias, while the population living in Public housing generally own their dwelling units.

3. LAND/LOT
3.1 NET AREA:
By land /lot net area is meant the property's taxable area, or the private and semi-private use areas.

Regardless of size and number of units that fit in, properties are counted as a legal unit, and therefore the appraisal considered properties as a whole. When it became necessary to withdraw dwelling's individual value, an average was obtained by dividing the property's value by the number of dwellings. In reality, each part of the property may have different values which reflect its location, access, services, shape, views, odors, noise, ventilation, and so on. Therefore, each apartment in a walk-up building and each room in a tenement may have individual values.

However, Public housing has been approached differently. Appraisal considered the dwelling and the buildings characteristics, although not directly land. The attributed land area per apartment is taken as the building's recreational area (private and semi-private use) divided by its number of apartments. The figures obtained are approximate.

Net area ranges have been previously described in the Physical Data Matrix section.

3.2 LAND/LOT VALUES:
There are basically two criteria which may be used for land value analysis: a) in base of the Official Cadastre, and b) based on commercial values. The first one is used for property taxation, while the second for property transactions. Commercial appraisals are more realistic in describing the values of different housing systems because they reflect a day-to-day demand, whereas cadastre values are revised every 5 years and lack continuous responsiveness to market forces.

The cadastre values were only used for comparison, especially since the last time they were reassessed was in 1969-70. The commercial land values are higher than the cadastre land values as the following average indicators show:

T. 19: CADASTRE/COMMERCIAL LAND VALUE RATIO IN 1970.

	HOUSING SYSTEMS	RATIO
VL	CIUDADES PERDIDAS	1.00
L	COLONIAS NUEVAS	1.50
L/ML	COLONIAS VIEJAS	1.30
L/ML	VECINDADES	1.05
ML/M	CONJUNTOS	1.20

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES...OP.CIT. DIRECCION DE CATASTRO E IMPUESTO PREDIAL DDF, ALBUM DE VALORES UNITARIOS... OP.CIT.

At the turn of the 1970 decade, downtown cadastre and commercial land values were fairly similar (ciudades perdidas, vecindades). Intermediate ring colonias proletarias viejas and Public housing denote some land value differences, whereas new colonias experienced at least a 50% variation on their land values.

The land value analysis deals only with values that are representative of each locality. Land values on avenues, that in most cases were selected as boundaries of the locality, are therefore not considered.

It should be remembered that commercial and cadastre land values refer only to low income housing. Usually, higher income residential areas, commercial axis of the city, office areas, and so on, have considerably higher value differences: 1:2 to 1:3 according to Sordo (1974:4) and Pichardo (1972:203)

T. 20: COMMERCIAL LAND VALUES. 1970. LAND/LOT AREA PER DWELLING.

	ESTIMATED RANGES ($/m2)	(m2)
CIUDADES PERDIDAS	40 - 60	20 - 30
COLONIAS NUEVAS	4 - 24	120 - 250
COLONIAS VIEJAS	20 - 40	150 - 300
VECINDADES	40 - 100	20 - 40
CONJUNTOS	24 - 60	50 - 200

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES... OP.CIT. TABLE 10.

CIUDADES PERDIDAS:
High land values result from location and the central city's adequateness in services and community facilities. But the ciudades themselves have poor service supply: water tap for communal use, no sewerage, no drainage, and limited electricity supply (usually stolen from public power lines).

The localities in which the ciudades are, have normally adequate service of water, sewerage, drainage, and electricity. They have refuse collection, telephone, good public transportation, street lighting and pavement in the streets. In the BUENOS AIRES case, community facilities are excellent, since the locality has public and private hospitals/health centers, schools and playgrounds, churches and cemetery.

The predominant land use of the locality is residential mixed with retail shops, light industry, mechanic and craftsman workshops. The ciudades tenants therefore seek employment in nearby facilities.

Since intermediate ring ciudades are mostly located in block's core, they don't have land available for expansion. Usually the number of shanties/households that can fit in a lot, varies according to its size and to demand but remains within the range of 50 to 200 shanties per community. Typically shelters are located in the backyard of several blocks (core), but sometimes they settle in any vacant lot. Land values of block's core are less than that of the lots which have

direct access from the street. Values are strongly determined by the lots' location and their services. The appraised land value of BUENOS AIRES lot is $38/m2.

COLONIAS PROLETARIAS NUEVAS:
The cheapest land available in the housing market is the periphery, where large extensions of "unproductive" land are urbanized to meet low income groups intense demand for housing.

Private contractors, real estate developers, or simply land owners/speculators are responsible for the fast growing Metropolitan expansion. Actually the colonias have no limit concerning their size: they can be average as is JALALPA (540 lots), as large as SAN AGUSTIN (1500 lots) and as uncommonly large as NETZAHUALCOYOTL (137,000 lots) Normally, colonias offer "commercial" lot sizes. In JALALPA lots have 200 m2; in NETZAHUALCOYOTL around 150 m2, and in SAN AGUSTIN, lot sizes vary accoridng to slope: 120 m2 to 300 m2.

Due to the intense demand, speculative developments "open to sale" as soon as subdivisions are traced on the field. Lots are sold with the promise that services will gradually be implemented. Since law enforcement is not efficient, speculators end up selling all the lots without fulfilling their promises.

Recent speculative developments have inadequate services. Localities lack water, sewerage or drainage connections. The streets and walkways are not paved. Only electricity is available as well as street lighting. Public transportation is normally limited, same as the telephone service and refuse collection.

Community facilities are inadequate if available. Schools operate with over-demand. Other facilities like fire protection, health centers, recreational areas, do not exist or provide limited service.

Land values in new colonias vary according to lots' sizes, community's services and facilities, and to colonia's location within the urban context. JALALPA is practically inaccessible with public transportation. Land values there average $8/m2; while NETZAHUALCOYOTL having limited transportation facilities average $18/m2 on interior lots. SAN AGUSTIN is located near employment sources but with inadequate transportation. Land values there average $12/m2 on interior lots.

With time, the Government gradually provides the basic services and facilities. In some parts of JALALPA and NETZAHUALCOYOTL, water, drainage, and sewerage systems are being implemented. LOMAS at the moment still remains with promises.

COLONIAS PROLETARIAS VIEJAS:
Old colonias, once located in the periphery have been absorbed by urban expansion and actually form the city's intermediate belt.

This expansion has benefited in many ways old colonias. Principally, the construction of main circulation arteries has given them direct access to downtown and other parts of the city. Along with it came the service infrastructure. Consequently, land values have several times doubled since the colonias were originally developed more than 25 years ago.

In fact, this housing system has adequate service supply in water, sewerage and storm drainage; as well as telephone, public transportation, refuse collection, electricity and street lighting. Streets and walkways are paved.

The community facilities are generally adequate in schools and inadequate in health centers, fire protection and recreational areas.

Land values in old colonias reflect their locality's services and facilities, and their land use. In PRO-HOGAR, a predominantly residential locality, interior lots were appraised at $32/m2. In VALLEJO's mixed land use, lots were appraised at $29/m2 for interior residential lots.

The PRO-HOGAR locality has 1860 lots with an average of 200 m2/lot. The contrary, VALLEJO is not an instant development, but represents the typical case of gradual and mixed expansion. Its 1800 lots range from 90 m2 to 1000 m2 within the same block.

VECINDADES:
The highest land values registered in low income housing belong to downtown area, which for centuries has been the Nation's and the City's principal social, economic, political and administrative center.

Land values are high due to location and adequate service supply: water, sewerage, drainage, refuse collection, public transportation, telephone, electricity and street lighting, pavement of streets, sidewalks and walkways.

The community facilities are adequate as well: fire protection, health centers, schools and playgrounds, churches, and so on. Only recreational areas are limited.

Tenement's location is excellent. Localities are near the largest wholesale and retail commercial areas, the wholesale food market of the city, Government offices (Federal and local)... plus small scale manufacturing industries, all which represent potential sources of employment for unskilled, semiskilled and skilled workers or employees.

Low income housing stock in the locality, has remained unchanged for decades. Consequently, land values haven't experienced substantial increases during that time. However, land values remain comparatively the highest of the low income housing market. Land values in downtown areas are quite homogeneous, since localities have similar characteristics. In CASA GRANDE, land was appraised at $38/m2 and in LA FLORIDA, at $43/m2.

Tenements vary in size. In CASA GRANDE, the 7249 m2 lot contains 157 apartment units; while the 1554 m2 lot of LA FLORIDA contains 46 apartments.

CONJUNTOS HABITACIONALES:
The land in Public housing doesn't relate to market values, since housing agencies had until 1973, the capacity to obtain land by expropiation (through Presidential Decree), justifying it as "Public" need or purpose. Land expropiation for housing continues to be feasible, but administrative procedures have been channeled through one agency: "Instituto Nacional para el Desarrollo de la Comunidad Rural y Vivienda Popular." (INDECO)

Expropiation costs are minimal in regard to the value of the land. The indemnization that is offered to land owners (based on raw land cadastre value) plus the administrative costs of expropiation do not account for more than 5% of property's value. (AURIS 1974:78)

Housing agencies generally expropiate ejidos located in the periphery and sometimes non-urbanized land in the intermediate ring. (S.J. ARAGON, IZTACALCO) Exceptionally, agencies have attempted urban renewal. (NONOALCO-TLALTELOLCO)

The ejido land values are normally very low since land is used for agriculture or has remained unproductive. Land values increase when services and utilities are provided. It is the local Government who absorbs the costs of providing those services. Housing agencies absorb the costs of service distribution within the project.

Once the "raw" land is converted to urban uses and the agencies invest in housing construction, the market land values of the site and of the surrounding areas will start to increase. Something similar happens in urban renewal projects. Since projects take place in deteriorated tenement areas, when agencies start to invest, commercial activities sprawl around the site stimulating value increases. In both cases, land value increases are usually not considered by housing agencies, nor will they consider the economic spillovers on the project's area of influence.

From case studies we learn that Public housing offers adequate utilities and services: water sewerage, drainage, refuse collection, public transportation, telephone, electricity and street lighting.

The community facilities are also adequate: schools, playgrounds, health centers and abundant recreational areas, which none of the other housing systems have.

Public housing projects vary in scale: from large projects like S.J. ARAGON (9927 dwellings) and NONALCO (11,916 dwellings) to regu-

lar scale projects like IZTACALCO (5690 apartments).

Since the projects have adequate services and facilities, land values vary mostly according to location. In city center land is more expensive than in the intermediate ring or the periphery. Land values reflect also the type of housing developed and its investment. S.J. ARAGON row housing has comparatively low land values ($24/m2), whereas NONOALCO high rise buildings are capital intensive which increase land values to $52/m2. IZTACALCO walk-up apartments have an attributed land value of $36/m2.

3.3 LAND/LOT TENURE:

There are basically two types of land/lot tenure: the legal and the extra-legal; each of which there are two variants: rental and ownership.

Ciudades perdidas represents the case of households that rent land to erect their shack. Land tenure is extra-legal since rentals are maintained by verbal agreement. Also, squatter settlements are extra-legal situations, but with land ownership claims. Extra-legal housing correlates with the lowest income groups.

The legal-rent cases are represented by vecindades and walk-up apartments in colonias viejas. Whereas, new colonias and Public housing deal with ownership mode. The legal tenure relates to low and higher income groups that can afford the purchase of property.

4. DWELLING UNIT VALUE

4.1 DWELLING UNIT VALUE RANGES:

The appraisal of selected low income housing situations offered important information regarding the dwelling's value and their value distribution. From research the following value ranges were elaborated:

T. 21: DWELLING UNIT VALUE RANGES. 1970.

	HOUSING SYSTEMS	($)
VL	CIUDADES PERDIDAS	- 1400
L	COLONIAS NUEVAS	2000 - 4400
L/ML	COLONIAS VIEJAS	4400 - 10,000
L/ML	VECINDADES	1400 - 2000
ML/M	CONJUNTOS	4400 - 12,000

SOURCE: VALUATION OF CASE STUDIES. HIPOTECARIA BANCOMER SA, ALBUM DE VALORES, OP.CIT.

Shanties lack monetary value. For comparative purposes however, the appraisal considered the land shanties occupy and attributed them a value.

The value of dwellings in new colonias is related to their construction stages. Materials are fairly similar in all cases. Construction quality and value increases as households add more finishings to their dwellings.

Dwellings in old colonias proletarias reached high values because in 2 or 3 decades, their land appreciated substantially more of what their dwelling depreciated.

Apartments in vecindades have a low value because their limited size and deteriorated construction quality; in spite of the fact that tenements are located in high land value areas.

From the appraisal of the Public housing cases it is obtained that dwellings are the highest valued in the low income housing market. Values resulted from the combination of several factors: recent construction, fairly good quality, adequate area per dwelling unit, and their complement in landscaping, parking, recreation and community facilities.

4.2 PERCENTUAL RELATION OF VALUES:

The selected value components of dwellings are: land and construction. These components helped analyze the dwelling's value distribution. It was considered that other qualitative components--like service supply--are included and compose the value of land. The same goes for material qualities which compose the dwellings' construction values. The relation that value components have in low income housing is as follows:

T. 22: PERCENTUAL RELATION OF DWELLING's VALUE.

		LAND (%)	CONSTRUCTION (%)
VL	CIUDADES PERDIDAS	100 -	0 -
L	COLONIAS NUEVAS	60 - 80	40 - 60
L/ML	COLONIAS VIEJAS	30 - 70	70 - 30
L/ML	VECINDADES	80 - 100	20 - 0
ML/M	CONJUNTOS	20 - 60	80 - 40

SOURCE: VALUATION OF CASE STUDIES. HIPOTECARIA BANCOMER SA, ALBUM DE VALORES... OP.CIT.

In new colonias, a substantial proportion of the dwellings' value is represented by their lots. When dwellings are at early construction stages, 80% of their values are composed by their land. At later construction stages, construction values increase.

Since dwellings in old colonias have reached full expansion, approximately one third of their value derives from land. But in walk-up apartments, the higher construction density accounts for up to two thirds of the dwellings value.

In vecindades, more than 80% of property's value is derived from its land values.

Public housing has a range of dwelling value distribution which relates to the housing project type. In row housing, more than half dwelling's appraised value is represented by land; while in high rise projects only 10% of apartment's total value belongs to land.

6. INDICATORS

6.1 VALUE PER PERSON:

The household size is taken as an indicator to attribute the dwelling value per member. The ranges of values per capita are:

T. 23: INDICATORS: DWELLING VALUE PER PERSON.

	HOUSEHOLD SIZE (PERSONS)	VALUE/CAPITA ($/PERS.)
CIUDADES PERDIDAS	6, 8, 10	- 160
COLONIAS NUEVAS	6, 8, 10	320 - 800
COLONIAS VIEJAS	6, 8	800 - 1600
VECINDADES	6, 8	160 - 320
CONJUNTOS	4, 6	1200 - 2000

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES... OP.CIT.; BAZANT J. ET AL., URBAN DWELLING ENVIRONMENTS...OP.CIT.,P.20,30,44,56,67,77,85,98, 100,110,121,132; TABLE 21.

The per capita value of Public housing is 5 to 10 times higher than that corresponding to family members in ciudades perdidas or vecindades.

Notice that dwellings' values in ciudades and some colonias are 8 to 10 times more of its per capita value, while in Public housing this relation is between 4 and 6.

6.2 INCOME TO VALUE RELATION:

The population's income and their dwelling's value are taken as indicators to illustrate their monetary relation, as the following figures show:

T. 24: INDICATORS: INCOME/VALUE RATIO.

		ANNUAL INCOME ($)	DWELLING VALUE ($)	RATIO
VL	CIUDADES PERDIDAS	- 432	- 1400	1:2 - 1:3
L	COLONIAS NUEVAS	432 - 1296	2000 - 4400	1:3 - 1:4
L/ML	COLONIAS VIEJAS	1296 - 2592	4400 - 10000	1:2 - 1:4
L/ML	VECINDADES	1296 - 3456	1400 - 2000	1:1 - 1:2
ML/M	CONJUNTOS	2592 - 5184	4400 - 12000	1:2 - 1:3

SOURCE: DERIVED FROM TABLES 14 and 21.

A shanty in a ciudad perdida has an attributed value equivalent to approximately 3 times its household's annual income.

The new and old colonias have similar income/value ration. When income increases, households tend to invest their savings on dwellings maintaining therefore a proportional ratio. These housing systems have the highest income to value ratio as a result of rapid land value increases.

The opposite case is presented in vecindades, where land values increase at a minor rate. The income to value relation is practically constant and within similar proportions. Dwellings' value are equivalent to household's annual income.

Public housing has an income/value ratio which doesn't present considerable variations, in spite of the differences in values appraised for each housing type. This is because agencies study the "target" income group and offer conventional housing within their possibilities.

4. GRAPHIC EVALUATION

This section is devoted to the graphical expression of the dwelling environments' basic physical and economic characteristics. It also attempts to correlate graphically the mentioned characteristics with population and urban context.

4.1 LAND UTILIZATION, DENSITY:
It is observed that lower income groups have more control over their housing process and dwelling environment. A high proportion of land is utilized for private or semi-private use, or for community's semi-public use. Construction is consequently more compact and densities are higher. As income increases, households will have the means for purchasing lots in colonias and their control over their environment will decrease. In Public housing, population has no control over housing or environment, so land utilization and densities be entirely dependent on the project's design.

In the ciudad perdida (case 1) notice that population has practically built-up their own environment. Areas for circulation (whether public or semi-public) are really kept to a minimum, intensifying private land utilization.

The colonias proletarias nuevas (cases 2,3,4), old colonias (cases 5,6) and Public row housing (case 10) show similar land utilization patterns. This is because they are planned subdivisions, with minimum lot areas. Since new colonias are recently established and not yet fully occupied, they have lower density than older colonias that have compact construction. Public housing density is low due to generous open areas.

The vecindades (cases 7,8,9) denote also high proportions of private land utilization, keeping the interior circulations under community control. Public areas are at a minimum.

Public housing projects (cases 11,12) show medium and high densities. Public areas are predominant, which gives the population limited control over their own environment.

4.2 VALUE DISTRIBUTION, VALUE PER PERSON:
Similarly to land utilization and density, the dwelling environments denote particular patterns regarding their value distribution and the attributed value per person. It is observed that at lower income levels, housing values are mostly derived from land, dwellings themselves have secondary value. Once land tenure is assured, and as income increases, households will be investing in their dwellings. Public housing is capital intensive, where regardless of urban characteristics, agencies create fixed housing values.

In the ciudad perdida (case 1) land represents the value of this housing situation. Dwellings are shacks with negligible economic value. High land values, and high densities, bring down the value per capita.

In vecindades (cases 7,8,9) land also represents the housing situation's major asset; dwellings are deteriorated and have little economic value. Land values are high, and along with high densities, result in low value/capita ratio.

In colonias, dwelling values depend on their construction stages. In new colonias (cases 2,3,4) housing values result mostly from land values, since dwellings are at early construction stages. The value per person will tend to increase as populations invest on their dwellings. In urbanized old colonias (case 5) 2/3's of the value of housing will derive from land. On the contrary, in walk-up apartments (case 6) two thirds of dwelling's value is derived from its construction. Since dwellings are completed and have service facilities, their values are high. The value per capita is also high.

In Public housing (cases 1o,11,12) a greater proportion of dwellings' values are concentrated on their constructive component. Land assumes secondary importance. Due to the high construction quality of urban environments, the value per capita will normally be the highest of low income housing systems.

4.3 DWELLINGS' PHYSICAL AND ECONOMIC CORRELATION:

The urban dwelling environments were initially analized according to their physical characteristics: urban (land use, lot area) and dwelling (area, material quality). Afterwords, their appraisal offered information about their economic characteristics, mainly through two basic value components: land (after lot's area, service quality) and construction (after dwelling's area and material condition).

These four selected variables with which the housing situations have been analysed, are now used to identify their basic correlations with population (in terms of income and density) and urban context (in terms of distance and land/lot area). Although each correlation is described separately, it is emphasized that all interrelate and therefore should be viewed together. Each case study or housing system could be analyzed considering all its correlations: the population's income level is reflected in density, housing location, constructed area,... and these result in dwellings' physical and economic characteristics. For example, in the housing value case, it may be observed that some lower income groups live in the central areas where land values are the highest. This is possible because they share values among many -in terms of reduced dwelling areas. The more limited dwellings are, the more units will "fit" in the lot, which obviously result in high densities. This same income group could be traced through the construction value graphs, and after through their land and constructed areas graphs.

Population has been basically defined through their income level -expressed in dollars per year. Income is used as an indicator to identify the predominant economic groups within particular housing situations. Other households with other incomes may be found in the same system, but the income group defined is supposedly the representative of that particular housing system. The income level division has helped define the economic status of the population: very low, low, moderately-low. Income is also associated with household's expenditures on housing.

Density (expressed in persons per hectare) is an indicator used to define the population's intensity of use on their housing situation. Density sometimes relates to the family's way of life: from completely independent to a kinship community.

Distance (expressed in kilometers from the city center) is used as an indicator of urban location. Distance is here divided in three rings: central 0-5 km., intermediate 5-10 km., and peripheral 10-15 km. Distance or rings may be identified with particular development stages of the Metropolitan Area, and with its service infrastructure quality.

The gross area, defined in square meters, is the dwelling's private and semi-private area plus it's attributed public and semi-public land use area. This indicator is used to identify not only dwelling's size, but also its relation with circulation and other public areas. Dwelling's gross area, can be identified with the type of housing system; whether grid-iron, apartments or rental accommodations. It is also associated with land utilization.

4.1 LAND UTILIZATION: PATTERNS, PERCENTAGES, DENSITIES

1 BUENOS AIRES

Popular Very Low Income Shanties

Very low percentage of land for streets and walkways; only private land is sheltered area; semi-private land constitutes the only open space. High population density; very poor living conditions.

2 JALALPA

Private Low Income Row Houses

Medium percentage of land for streets, walways, open spaces; medium percentage of land for private use; medium/low population density.

3 LOMAS SAN AGUSTIN

Private/Popular Low Income Row Houses

Low percentage of land for streets and walkways, no land for public open spaces; high percentage of land for lots; medium population density.

4 NETZAHUALCOYOTL

Private Low Income Row Houses

Medium percentage of land for streets, walkways; medium percentage of land for private use; low population density. Poor layout with excessive public land.

5 PRO HOGAR

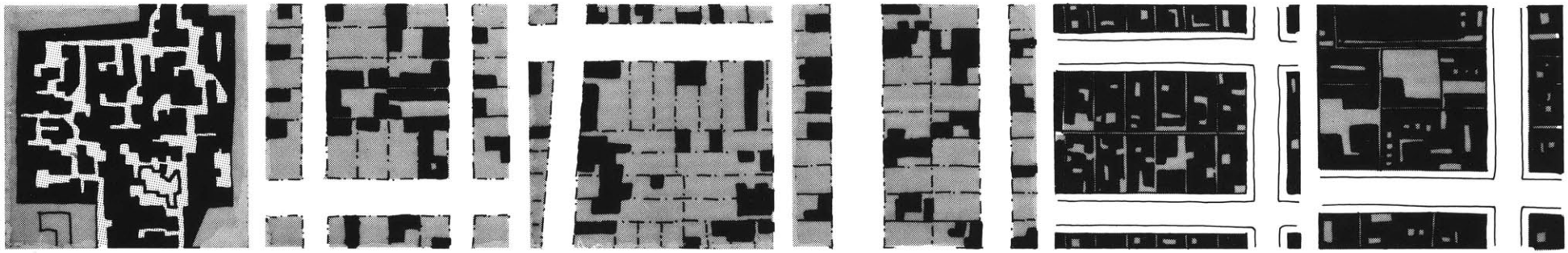
Private Moderately Low Row Houses

Medium percentage of land for streets and walkways; no land for public open spaces; high percentage of land for lots; medium population density.

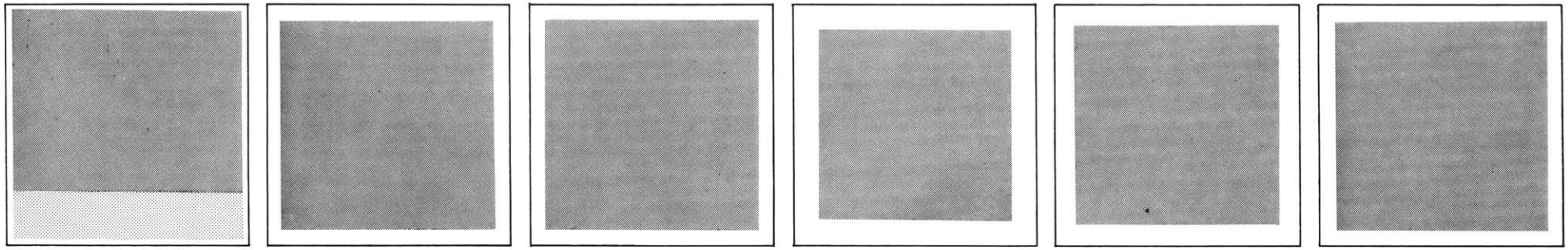
6 VALLEJO

Private Moderately Low Apartments

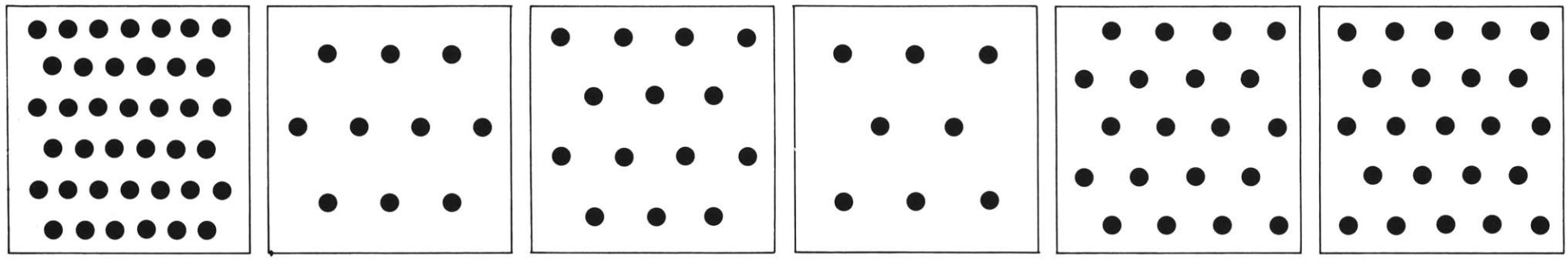
Low percentage of land for streets and walkways; no land for public open spaces; high percentage of land for lots; medium population density.



PATTERN



PERCENTAGES	1	2	3	4	5	6
Streets/Walkways	8	23	24	33	29	23
Playgrounds	-	-	-	-	-	-
Cluster/Courts	20	-	-	-	-	-
Dwellings/Lots	72	77	76	67	71	77



DENSITY	1	2	3	4	5	6
Persons/Hectare	750	200	330	166	410	423

● 20 Persons

7 LAS VIZCAINAS

Private Moderately Low Row Rooms

Low percentage of land for streets and walkways; high percentage of land for lots. Most of the land with private utilization is sheltered area; low population density.

8 TEPITO

Private Low Income Apartments

Low percentage of land for streets and walkways; high percentage of land for lots. Most of the land with private utilization is sheltered area; high population density.

9 TEPITO

Private Low Income Apartments

Low percentage of land for streets and walkways; high percentage of land for lots. Most of the land with private utilization is sheltered area; high population density.

10 SAN JUAN DE ARAGON

Public M.Low/Middle Income Row Houses

Medium percentage of land for streets, walkways, open spaces; medium percentage of land for private use; medium/low density. Poor layout with undefined open spaces result in excessive public land.

11 IZTACALCO

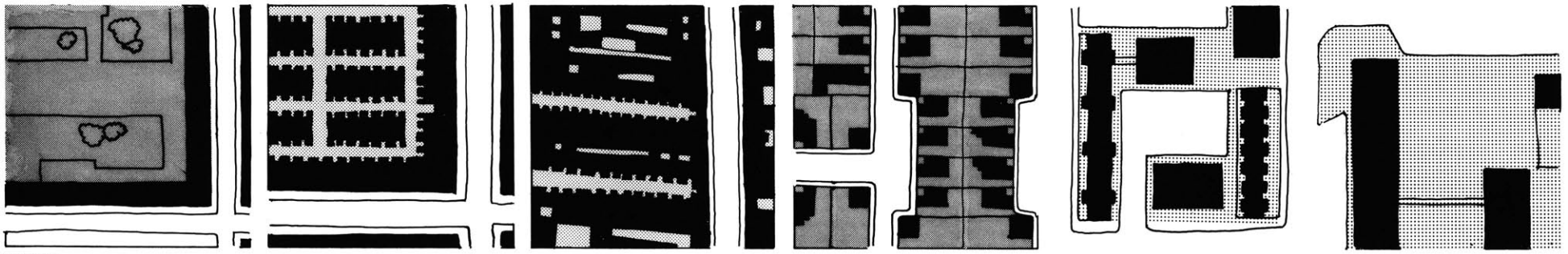
Public Middle Income Walk-up Apts.

High percentage of land for streets, walkways, open spaces; very low percentage of land for private use; medium population density. Poor layout with undefined open spaces result in excessive public land.

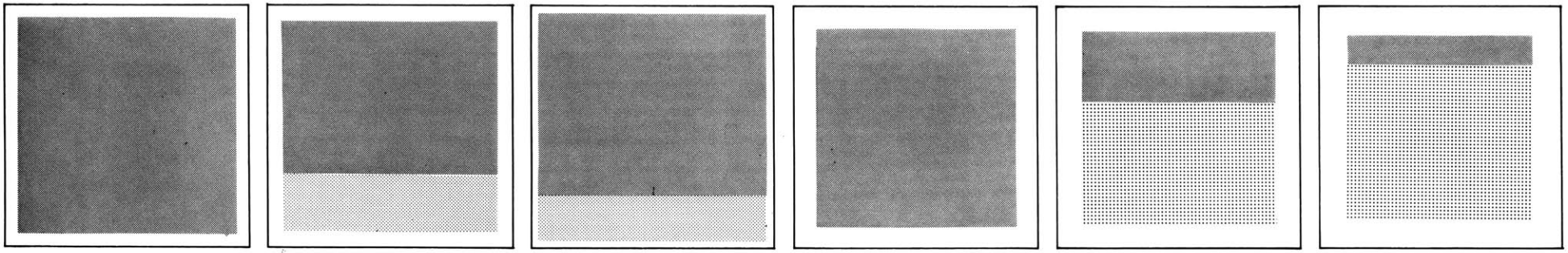
12 NONOALCO TLALTELOLCO

Public M.Low/Middle Income High Rise

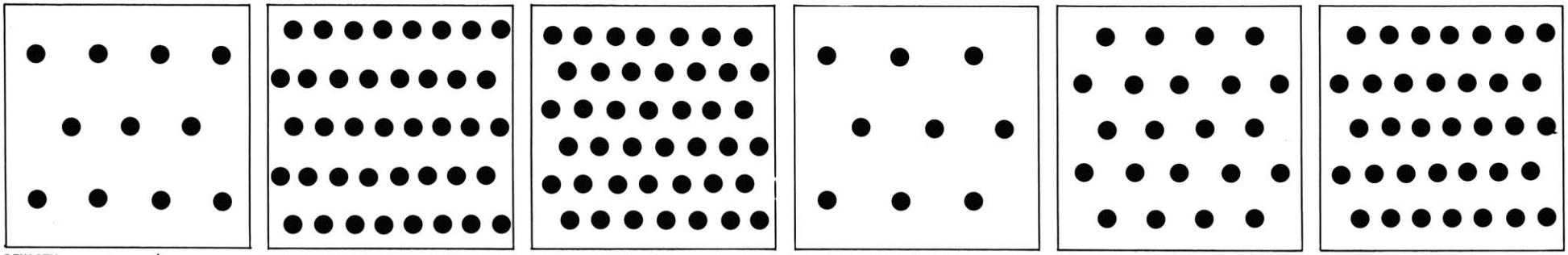
High percentage of land for streets, walkways, undefined open spaces; low percentage of land for private use; medium/high population density.



PATTERN



PERCENTAGES					
Streets/Walkways	19	23	8	34	35	36
Playgrounds	-	-	-	-	40	51
Cluster/Courts	-	22	22	-	-	-
Dwellings/Lots	81	55	70	66	25	13



DENSITY	Persons/Hectare	233	796	850	175	433	711

● 20 Persons

4.2 DWELLING UNIT: SCHEMES, VALUES, VALUE INTENSITY

1 BUENOS AIRES

Popular Very Low Income Shanties

Shacks are constructed with temporal materials. Their value is related to the land they occupy. They are limited in area and densely populated. Their per capita value is very low.

2 JALALPA

Private Low Income Row Houses

Dwellings are at early construction stages and have few rooms. Construction materials are permanent. Land represents the dwelling's major asset. Since dwelling values and densities are low, the per capita value is also low.

3 LOMAS SAN AGUSTIN

Private/Popular Low Income Row Houses

Dwellings are at a more advanced construction stage and contain several rooms. Bedrooms and living areas are in separate rooms. Dwelling values center on land. Low land values and low densities result in low per capita value.

4 NETZAHUALCOYOTL

Private Low Income Row Houses

Dwellings are near completion. They contain several rooms for different functions. Wash/bathrooms are built-although service facilities are not always available. Dwelling values center on land. Per capita value increases as land increases in value.

5 PRO HOGAR

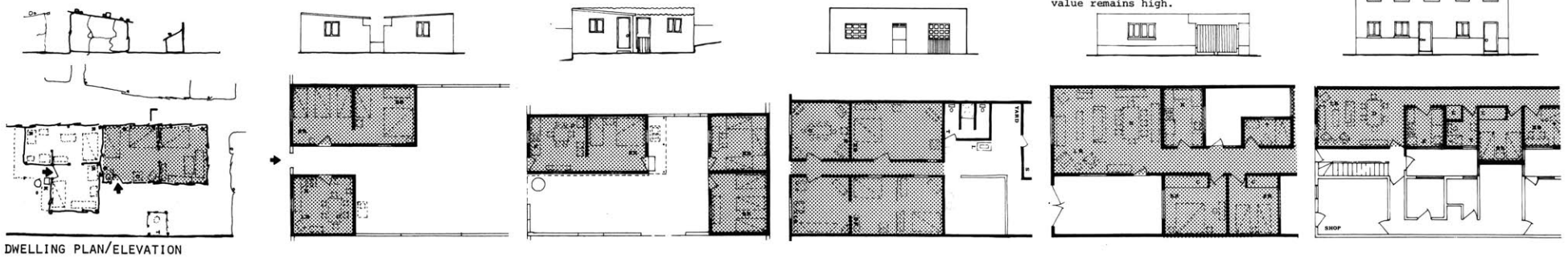
Private Moderate Low Income Row Houses

Dwellings have reached completion. They practically cover the lot,except for interior patios for ventilation and illumination. Dwellings have service facilities which increases considerably their value. Value still centers on land. Although dwellings have compact densities, per capita value remains high.

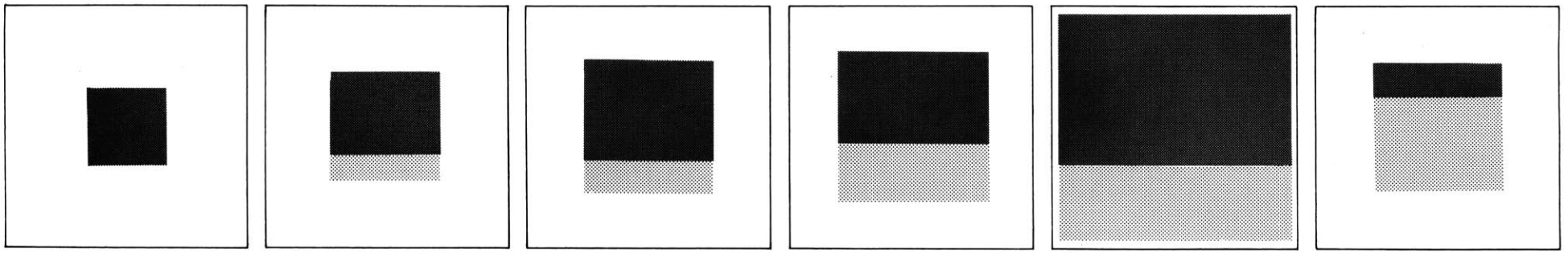
6 VALLEJO

Private Moderate Low Income Walk-up Apts

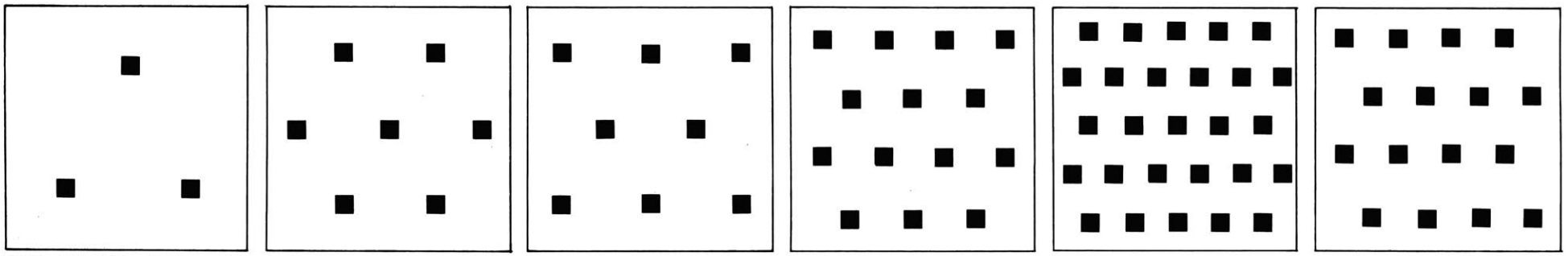
Each lot contains several apartments. Although with many rooms,dwellings are small in size. They include services and facilities. Values center on the building's constructive component rather than in land.



DWELLING PLAN/ELEVATION



VALUE PERCENTAGES:	1	2	3	4	5	6
Land	100.0	76.2	75.8	61.8	68.3	30.9
Construction		23.8	24.2	38.2	31.7	69.1



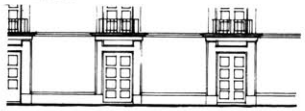
VALUE INTENSITY: $/Person	1	2	3	4	5	6
	147	350	396	699	1339	782

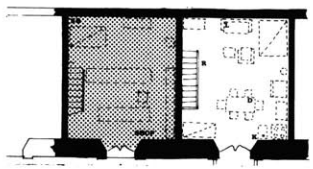
■ 50 Dollars

7 LAS VIZCAINAS

Private Low Income Row Rooms

Occupying a colonial building, Apartments have one spacious room with a shop in the ground level. No values are attributed to dwellings, since building is considered an historic monument.

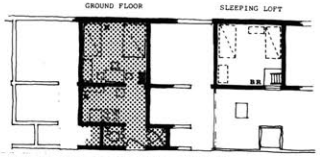




8 TEPITO

Private Low Income Apartments

Very limited in size. Apartments contain two rooms and a sleeping loft. Constructions are deteriorated. Dwelling Value depends on land. The per capita value is very low, due to tenement's high density.

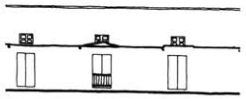


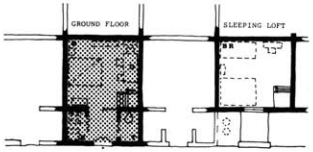
DWELLING PLAN/ELEVATION

9 TEPITO

Private Low Income Apartments

One room apartments with a sleeping loft, including basic services. Constructions are deteriorated. Dwelling value centers on land. High densities lower the per capita value.

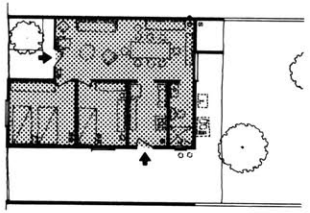




10 SAN JUAN DE ARAGON

Public M.Low/Middle Income Row Houses

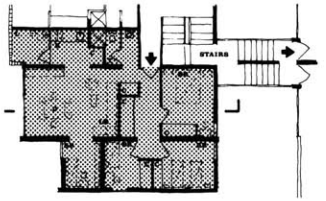
Instantly built houses, with conventional areas. Fully serviced and equipped. Land and construction values are high due to the quality of services and materials. Dwelling value centers on land value. Densities are low. Per capita value in high.



11 IZTACALCO

Public M.Low/Middle Income Walk-ups

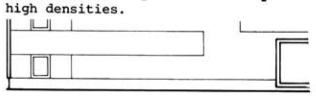
Apartments are conventional size. Include services and facilities. Land and constructions values are high due to service and materials quality. Capital intensive project, value centers on construction rather than in land. High per capita value.

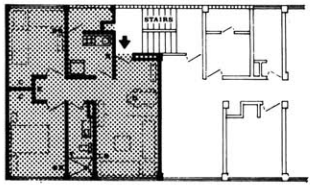


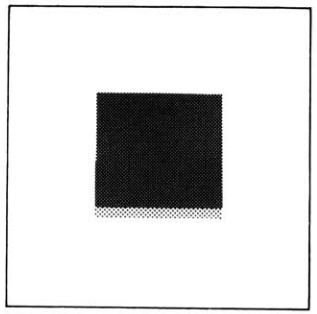
12 NONOALCO TLALTELOLCO

Public M.Low/Middle Income High-Rise

Apartments are conventional size. Fully serviced and equipped. Land and construction values are high due to the services and materials quality. High capital intensive project. Dwelling value centers on its construction. High per capita value in spite high densities.

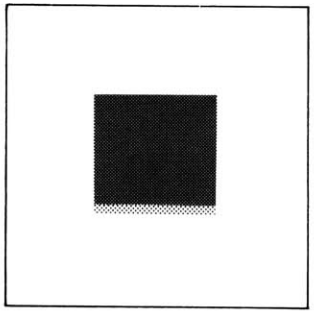






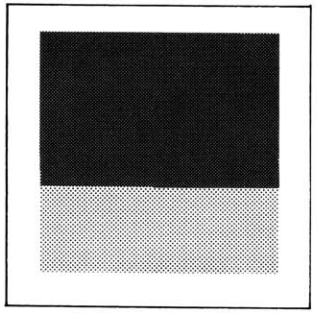
VALUE PERCENTAGES: Land 93.0

Construction 7.0



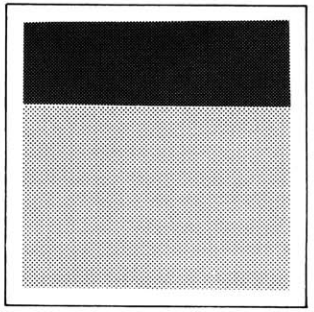
93.3

6.7



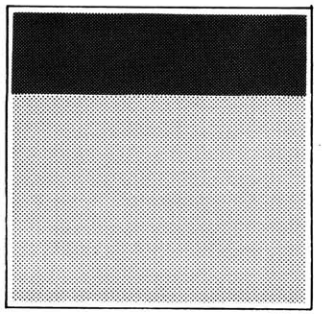
59.8

40.2



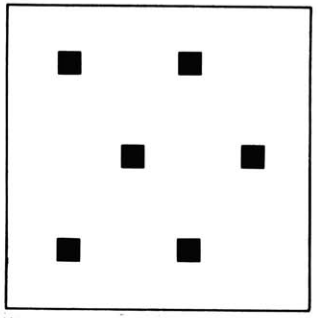
66.2

33.8



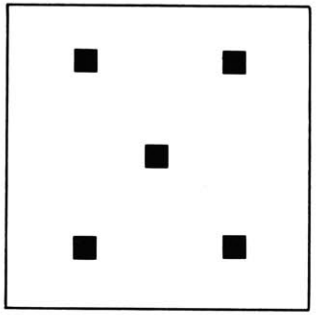
72.4

27.6



VALUE INTENSITY: $/Person 314

50 Dollars



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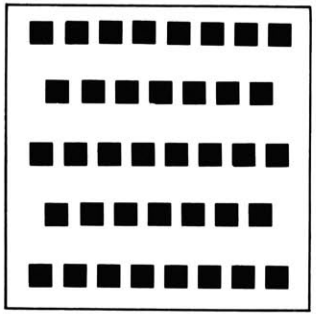

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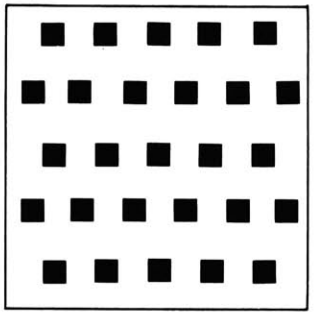

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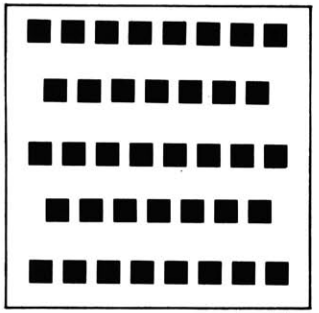
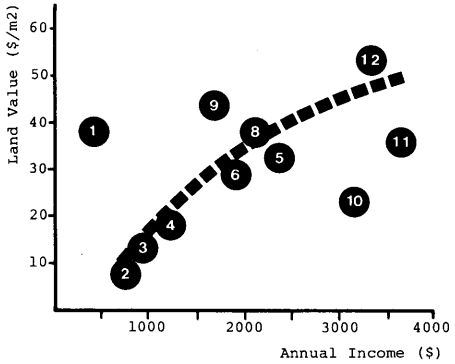
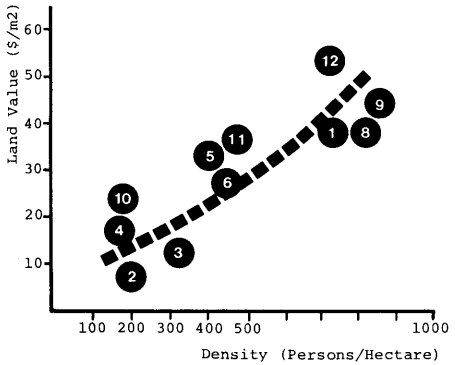


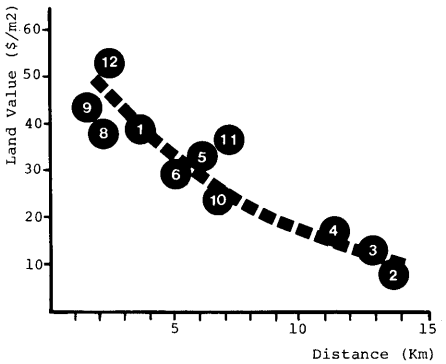
1881

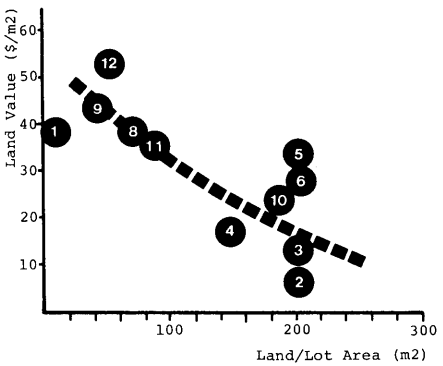
4.3 PHYSICAL / ECONOMIC CORRELATIONS

LAND VALUE









G. 1 LAND VALUE - INCOME:

Land values have a direct relationship with household's income, except in cases where housing is held under rental bases. In land ownership cases, low income housing has the lowest land value; but as income decreases land values tend to increase. In the cases where land values are already high, low income groups settle only on rental bases.

CIUDADES PERDIDAS (case 1): The very low income shantytowns are located in central areas where land values are high. The rent of land is based on individual agreements, but it is the entire community who ultimately yield property's revenues.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): The low income population earning above subsistence level, moves to the periphery where they find land values compatible with their incomes. The purchase of a lot becomes household's economic burden for many years.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Moderate-low income groups afford medium/high land values. When these localities were developed 25 years ago land values were very low, but have increased as the city has expanded.

VECINDADES (cases 8,9): Tenants' income vary from low to moderate-low levels. The better off tenants pay less of what they can afford, nonetheless high land value locations.

CONJUNTOS (cases 10,11,12): The moderate-low to middle income groups do not have difficulty in finding accomodations. In Public housing, fix land values are more a result of investment characteristics than a result of market forces. Row housing yields low land values, while capital intensive high rise projects yield high land values.

G.2 LAND VALUE - DENSITY:

In low income housing, density is in direct consequence of land value. The higher land values are, the more dense localities will be. As land value decreases, so does density; although not with the same rate. A person that moves from one land value to another does not necessarily pay, but trades less or more land area.

CIUDADES PERDIDAS (case 1): The shanty dwellers afford high land values by sharing them through compact high densities. In a way, the more households fit in a lot the "less" will they pay in land rent.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): Low land values result in low densities, because each household owns a lot. Land value tends to increase, especially in commercial areas, which are usually more densely populated.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Medium land values result in medium densities. Land scarcity maintain the values stabilized with compact densities.

VECINDADES (cases 8, 9): High land values result in high densities. Tenants trade limited living space (translated in high density) for their location.

CONJUNTOS (cases 10,11,12): In Public housing land values relate to densities according to the type of project: row, walk-up and high-rise. It is observed that at higher densities, more "recreational" areas are available.

G. 3 LAND VALUE - DISTANCE:

Land values are correlated with the distance that localities have to or from the city center. Values are higher in central areas than in any other part of the city; and they decrease as the distance from the city center increases.

Distance is also related to time. The oldest low income housing are tenements, located in the city center; whereas recent colonias are located in the periphery. The old colonias form the intermediate ring. Public housing has no relation with the development process of the city.

CIUDADES PERDIDAS (case 1): The BUENOS AIRES case is located within the inner ring. Land values are high because it's proximity to downtown and what that represents in terms of services and facilities.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): They are located in the periphery at more than 10 km. from city center. Low land values are a consequence of distance and inadequacies of services and facilities. Land values increase as city expands.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): They are located in the intermediate ring. The colonias have reached medium market values. Land values are increasing at low rates, because colonias are practically saturated and demand for housing is not intense.

VECINDADES (cases 8,9): Located within central areas, tenement land values are high because of their strategical proximity to employment sources and services. Land values are stabilized since tenements are saturated and no improvements have been made in this area.

CONJUNTOS (cases 10,11,12): Except for central area's renewal project which holds the highest land value (12), Public housing projects have medium land values. This is because their adequacy in services. Location is secondary.

G. 4 LAND VALUE - LAND/LOT AREA

Land value is in direct relation to lot area in subdivisions or the attributed area per apartment in walk-ups or high-rise buildings. As land value increases, the land/lot area of dwellings tend to decrease.

CIUDADES PERDIDAS (case 1): Shantytowns located in high value land/lot, manage to operate by limiting the shacks' areas. According to graph, shanty dwellers could obtain more area by shifting to lower land values.

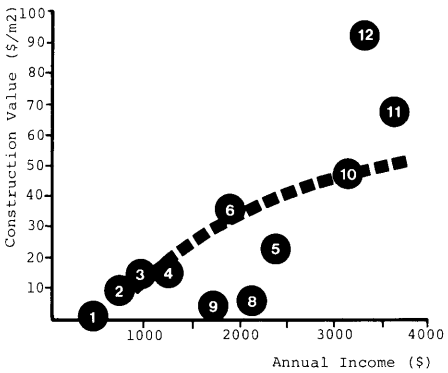
COLONIAS PROLEATRIAS NUEVAS (cases 2,3,4): Low land values on colonias imply larger lot areas. Land values tend to increase and eventually will balance with lot's area.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): In walk-ups, the lot area is "distributed" by the number of apartments it contains. (6) In subdivisions, each lot has at least one dwelling. (5) Altough in both cases, land values are within similar range, the attributed land value per dwelling is different.

VECINDADES (cases 8,9): High land values limit the attributed land area per apartment.

CONJUNTOS (cases 10,11,12): In row housing(10) the layout pattern offers excessive area per lot according to its land value. In high-rise housing (12) the apartments' attributed land area are low in comparison with high land values. In both cases, a dwelling's attributed area could be lowered by re-utilizing open areas adequately. Walk-ups have proportionate land value per attributed area.

CONSTRUCTION VALUE



G. 5 CONSTRUCTION VALUE - INCOME:

In low income housing, construction values are in direct relation to income. The exceptions are rental accommodations where tenants do not contribute to dwelling's maintenance or improvement. When households are property owners, they generally invest in dwelling construction. At lower incomes, construction values are lower since dwellings begin as shelters. As income increases, construction values tend to increase. In rental situations, low income groups find no incentive to invest in a dwelling that its not theirs.

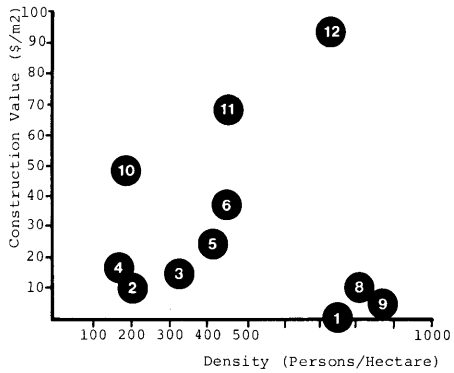
CIUDADES PERDIDAS (case 1): The population's main housing expenditures are concentrated on land rents, and they have no remaining resources to construct a shelter with permanent materials.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): Low income population allocate available resources for the construction of their dwelling. Construction values vary according to household's possibilities of investing in construction quality. In early construction stages, households channalize their efforts in dwelling's expansion. At latter construction stages, households invest on construction finishings.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): The moderate-low income dwellings have reached expansion and households invest mostly in improvements.(5) In walk-ups, construction values are higher because of building's structure.(6)

VECINDADES (cases 8,9): The low income population living in tenements are not responsible for building's cost or maintenance. Tenement constructions are deteriorated and its commercial value is minimum.

CONJUNTOS (cases 10,11,12): Only middle income groups can afford Public housing. Its construction values vary according to the type of building. Notice that construction values are considerably higher than in low income housing.



G. 6 CONSTRUCTION VALUE - DENSITY:

In low income housing, construction values do not have a direct relation to density. At higher densities, construction values remain low because people are not property owners. As density decreases, construction values tend to increase because the population has control over their dwelling construction. In Public housing, construction values are substantially higher since projects are built instantly.

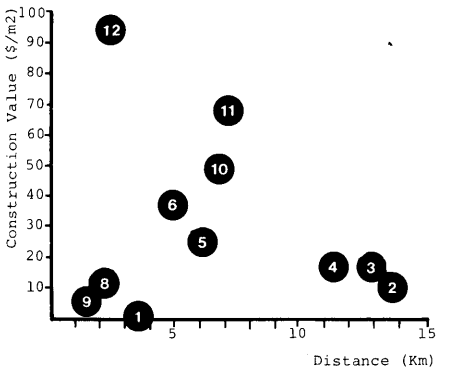
CIUDADES PERDIDAS (case 1): Self-help shelters are easy to build and to accommodate compactly in a lot, causing high densities.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): With unexpensive land to amortize, people allocate available funds for dwelling's construction. Construction values relate to dwelling's completition stage.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Medium range density results in compact constructions. Construction values are also moderate because of dwelling's services.

VECINDADES (cases 8,9): Tenements' limited apartment area and value result in overcrowdness or high density.

CONJUNTOS (cases 10,11,12): High construction values result from capital-intensive housing. With subsidies and through the manipulation of densities, purchasers amortize similar dwelling values, regardless of the project's type.



G. 7 CONSTRUCTION VALUE - DISTANCE:

There is no relation between construction values and distance. Public housing construction values are 3, 4 and up to 10 times higher than low income housing construction values. It is observed that construction values are lower in the city center and higher on the intermediate ring. In the periphery, construction values are low because of the dwelling's precarious construction stages.

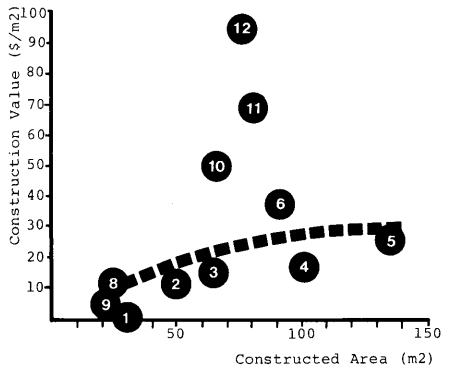
CIUDADES PERDIDAS (case 1): Temporary shanties have no attributable construction value. The population's priority is land location. It is likely that shanties will remain the same, as long as this income group requires the proximity to the city center for their subsistence.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): Low construction values depend of dwelling's construction stage. The lack of service infrastructure perpetuates precarious conditions in dwellings. As city expands, colonias will gradually be supplied with services. The value of construction tends to increase.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Dwellings on the intermediate ring have high construction values because of their adequate service supply which permits bathrooms and kitchens.

VECINDADES (cases 8,9): The frozen rents in tenements impedes their renewal and blocks their maintenance. Construction values are low, but are compensated by location (high land values).

CONJUNTOS (cases 10,11,12): Public housing has higher construction qu-lity than low income housing. The values too are higher, regardless of project's location.



G. 8 CONSTRUCTION VALUE - DWELLING AREA:

Construction values are directly correlated to dwelling's constructed area. As constructed area increases, dwelling's construction values tend to increase.

CIUDADES PERDIDAS (case 1): The population living in shantytowns rents land to settle. Shanty's area is minimal and limited to the area of land rented.

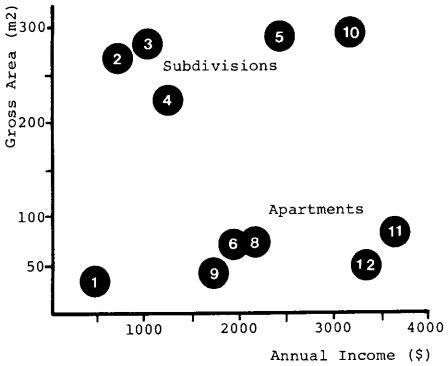
COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): With low land values, households have the lot's area for the expansion of their dwellings. Constructed areas vary according to dwelling's construction stage.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Dwellings are completed and have the largest constructed area of the low income housing system. With services included, construction quality increases.

VECINDADES (cases 8,9): Tenement's low construction values result from their poor physical condition. Dwellings' areas are limited as a consequence of land scarcity and values.

CONJUNTOS (cases 10,11,12): The construction values of Public housing are not comparable with low income housing, although dwelling areas remain within similar ranges as do some low income housing situations.

LAND/LOT AREA



G. 9 GROSS AREA - INCOME:

There is no relation between household's income and dwelling's gross area. The low income subdivisions have more similar lot sizes and layout patterns than higher income subdivisions. Apartment sizes are also similar for low and middle income groups, except for tenements which are unusually small.

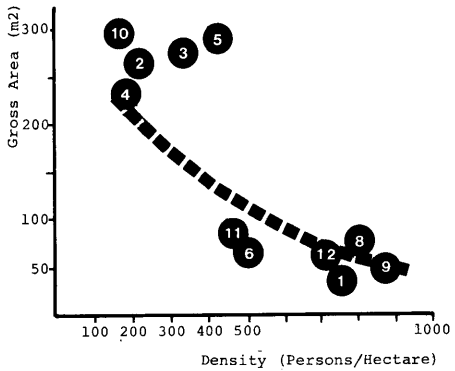
CIUDADES PERDIDAS (case 1): Population at subsistence level manages to live in the inner ring by limiting the rented area of land. The attributed area per shanty is minimum, even considering its attributed portion of interior walkways.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): Peripheral subdivisions offer commercial lot sizes to low income households. With low land values, layouts are generous in public areas which increase considerably the lots' gross areas.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Altough lots might have similar areas as in new colonias, the higher land values require a higher income in households. Public land use areas increase the lots' gross areas.

VECINDADES (cases 8,9): These income group live in reduced apartments, whose attributed land areas are far below that of standard size apartments.

CONJUNTOS (cases 10,11,12): Public land subdivisions have more similar lot areas than subdivisions developed for low income population. Apartments have the same attributed land area as apartments in colonias, but households' incomes are higher.



G. 10 GROSS AREA - DENSITY:

The dwelling's gross area is in direct relation to density. As density decreases, the dwelling's attributed area decreases. This is due to the land value's relationship to area. At higher land values, smaller gross areas. Households may trade land area -and density- for land values. Gross area has a direct relation with subdivisions' patterns or with apartments' building types.

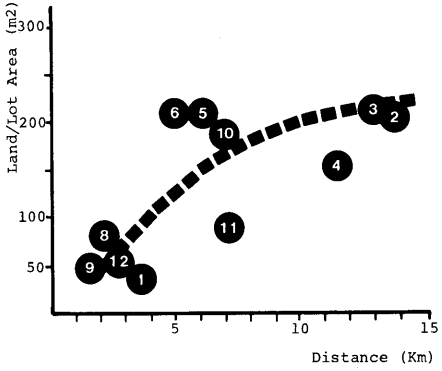
CIUDADES PERDIDAS (case 1): High land values give as consequence high densities which are obtained by reducing to minimal proportions the dwelling's area.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): The gross area of dwellings depend on the layout pattern: a) in lot sizes, and b) in circulation areas. Dwelling's gross areas are very large, which give low densities.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): In subdivisions, dwelling's gross area is large, yet densities are within medium range since housing construction is compact. Apartment's gross area is less, which yields medium densities also.

VECINDADES (cases 8,9): Compact construction keeps densities very high and minimizes circulation and open areas.

CONJUNTOS (cases 10,11,12): Public housing has a variety of densities which result in a variety of dwellings' gross areas. In row housing(10) dwelling's gross area is very large which keeps densities low. In high-rise apartments(12), gross area is small which result in high density. In walk-up housing (11), apartments have medium gross area which results in medium densities.



G. 11 LAND/LOT AREA - DISTANCE:

Lot area is in direct relation to its distance from the city center. In dowtown, the dwelling's attributed area is the smallest. As distance from the city center increases, the dwelling's lot area tends to increase.

CIUDADES PERDIDAS (case 1): The shanties have an extremely low attributed area per unit because land is expensive. The interior walkways are very reduced.

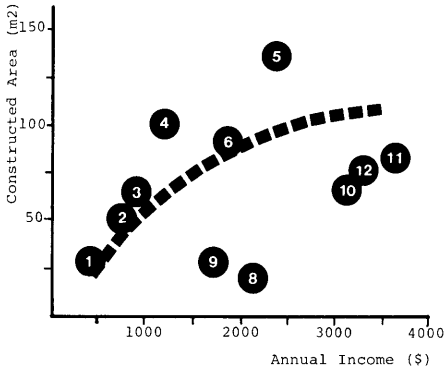
COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): Where land values do not represent economic constraints, peripheral subdivisions provide conventional lots, but devote large extensions of area for circulation. The lots' gross areas are therefore the largest in the low income housing market.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): In the intermediate ring, lot areas are conventional; but the dwelling's attributed land area is smaller than houses in subdivisions. A high proportion of layout area is devoted to circulation.

VECINDADES (cases 8,9): The tenements limited attributed gross area is a result of reduced common courts and public circulation. Location in city center makes land scarce.

CONJUNTOS (cases 10,11,12): Public housing apartments -walk ups and high rise- have an attributed gross area comparable to that of low income apartments. This is because there are many apartments in a building, and they "share" the generous open areas.

CONSTRUCTED AREA



G. 12 CONSTRUCTED AREA - INCOME:

In low income housing, dwelling's constructed area is related to household's income level. At lower income levels, dwelling's constructed areas are lower. As income increases, dwellings tend to expand. In apartments, income is not a factor in determining its' area, but is related to construction quality.

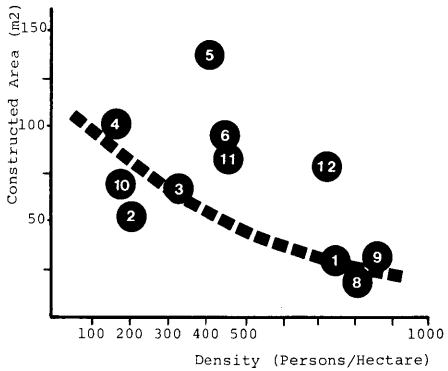
CIUDADES PERDIDAS (case 1): A shanty's covered area is related to household's income. Yet, this income group has limited choices regarding its shelters' sizes, since land is scarce.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): The constructed area varies according to the household's income and the time the dwelling has been under construction.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Moderate-low income groups have completed their construction process. Dwellings have the largest constructed area. Apartments have limited area, but households spend less on housing.

VECINDADES (cases 8,9): Tenements have the smallest constructed area in the housing market.

CONJUNTOS (cases 10,11,12): In Public housing the constructed area per dwelling unit is within similar ranges, regardless of whether projects are row housing, walk-ups or high rise buildings.



G. 13 CONSTRUCTED AREA - DENSITY:

Density is directly related to dwelling's constructed area. As constructed area decreases, density tends to increase, because a larger number of dwellings can fit within a lot. Each housing system has particular household sizes which relate to constructed area in terms of density.

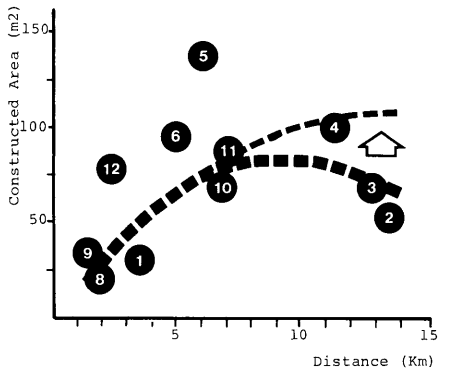
CIUDADES PERDIDAS (case 1): This housing situation has a high density, both because the shelter's constructed area is very limited and because the household's size is very large.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): Densities are low in spite of the fact that household size is normally large. Dwellings are at early construction stages, yet circulation areas are excessive for the residents' own use.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): Densities are medium because of compact constructions, regardless of whether in subdivisions or in apartments.

VECINDADES (cases 8,9): Central housing accommodations have been saturated for decades. Apartments' reduced sizes along with intense demand keeps densities very high.

CONJUNTOS (cases 10,11,12): Public housing observes a direct relation between dwelling's constructed area (in terms of bedrooms) and family size. Density depends on the type of project.



G. 14 CONSTRUCTED AREA - DISTANCE:

The dwelling's area is in direct relation to it's lot area and has an indirect relation to it's distance to the city center. As land becomes available, dwellings will tend to be larger. In locations where land is scarce, dwellings are limited in area. Dwellings are small in downtown. In intermediate ring, dwelling areas are high because they have been completed. In the periphery, constructed areas are low because dwellings are still under construction.

CIUDADES PERDIDAS (case 1): Shanties cover a minimum area and have generally no possibilities for future expansion, becase of overcrowdness.

COLONIAS PROLETARIAS NUEVAS (cases 2,3,4): At initial construction stages, dwellings have 2 or 3 rooms. As dwellings expand, rooms are separated according to functions. Because land is available, dwellings will continue to expand.

COLONIAS PROLETARIAS VIEJAS (cases 5,6): The intermediate ring dwellings have large areas after several decades of construction process.

VECINDADES (cases 8,9): Having been constructed for over half a century, downtown tenements have not been renewed or expanded. Areas are limited.

CONJUNTOS (cases 10,11,12): Public housing does not necessarily consider location with respect to apartment sizes.

IV. ECONOMIC ANALYSIS

1. NET REVENUE

This is an attempt to clarify the real estate and financial implications of low income housing within the Metropolitan context. This analysis, however, bears its own limitations.

The housing market of Mexico City has a variety of characteristics--land tenure, dwelling types, rents, and so on--some of which present obstacles for a rigorous comparative analysis. Essentially, these obstacles are imperfections in the urban economy. Some imperfections are concrete and may therefore be directly analyzed (e.g. rent controls), while others remain intangible and complicated to approach and analyze; as for example the housing demand-supply elements, particularly those caused by the "unpredictable" private and even political interests in the city's urban development.

It should also be noted that the information on low income housing has primarily been obtained through field research. Unfortunately, there is a lack of relevant information concerning the economy's impact on low income housing, which could have complemented the empirical part of this study.

These constraints oriented the present analysis towards the definition of the economic performance of low income housing. All cases have been approached and analyzed in the same manner, aiming to establish a comparative base.

1. VALUE CRITERIA:

The preceding value analysis emphasized the physical aspects of property (including its services), not mentioning its economic behavior and role in the housing market.

Most of the selected case studies are fundamentally simple housing situations. To evaluate them, two methods were utilized. With the "cost approach" method, the value of selected housing situations was estimated, by quantifying its constructive components and multiplying them by their respective costs. The values obtained with this method were later corroborated through the "market approach valuation" method. This method gathers price data from transactions of similar properties that sold in recent times and which are comparable in condition and location to the property for which a judgement of value was formed. No further adjustments were necessary since the market price data already reflects the state of repair and the location characteristics.

The intention is therefore to relate the research information to Mexico City's current financial rates and its real estate development trends, both of which have a direct economic consequence on housing. Two evaluation criteria are used:

The "opportunity rates" selected for this analysis are those of the mortgage market which are commonly used in housing operations.

The real estate "capitalization rate" is the rate at which properties increase in value on the market. Both rates will be used to estimate the property's return, its value and its imputed revenue.

Initially, however, it is necessary to estimate the property's net revenues (net before expenses) which is made by subtracting the normal (i.e. average) operating expenses that are incurred in the property maintenance and utilization from the effective gross

revenues. The first section of the analysis will deal with the estimation of low income housing net revenues. An emphasis is made on their fiscal and financial implications.

The basic information required for this section is the values and gross revenues of low income housing situations. These have already been obtained in the preceding property value analysis (Economic Data Matrix). It should be clarified that housing expenditures, in terms of amortizations or rents, are the amounts at which properties are exchanging or are being used. Housing expenditures, then, are taken as the property's gross revenues; that is, they represent the gross returns of property.

2. OPERATING EXPENSES

2.1 MAINTENANCE

By maintenance is understood the regular expenses on property's physical upkeep (cleaning, painting,etc.), its supplies, replacements and repairs.

It is found that low income housing has maintenance charges that are practically insignificant.

In general, lower income populations do not regularly allocate funds for the maintenance of their dwellings. Some, however, are concerned with their environment and may occasionally meet in groups and contribute either their labor or an agreed amount of money to make a specific community improvement.

Since new colonias and ciudades perdidas lack service supply, households don't spend on property maintenance or physical upkeep.

The moderate-low income households allocate minimum amounts for housing maintenance. Usually, expenditures concentrate on repairs and replacements of water and electrical or sewerage installations. Households keep these services in fairly good condition. It is estimated that maintenance charges do not exceed $30/year on individual dwellings and $24/year on apartments (i.e. in old colonias). Due to tenements' limited services, it has been calculated that tenants spend only up to $10/year in service maintenance. Maintenance charges in these cases represent approximately 1% of the household income.

In Public housing however, the abundance of "open" areas, presses community members to gather in associations of vecinos (neighbors) in order to maintain their environment properly; since local government usually does not provide adequate maintenance. The association takes over in the maintenance and surveillance of the housing compound and fixes quotas for members to pay. Quotas generally do not exceed $50 annually, which represents approximately 2 % of the household's income.

2.2 TAXATION:

In Metropolitan Mexico, property taxation is applicable on a different basis.

Properties located within the urban areas of the Federal District are taxed on the basis of: a) rents (revenues produced) or b) appraised capital values--depending upon the property's location, its use, year of construction, and whether it is owner occupied. In DF, it is estimated that approximately 50% of properties are taxed on a rental basis. (Oldman 1967:530)

The rental basis is considered when a property is either entirely or partially held for rent; and the appraisal basis when properties are owner occupied.

The properties levied on a rental basis have a tax rate of 12.6% of their gross rents. Those taxed under an appraisal basis have a nominal rate of 1.09% of the property's appraised value. The effective tax rate is only 0.5% (Oldman 1967:79); since assessed values are below market values or declared rents be-

low the property's rent capacity.

The property's cadastre values will now be considered for the estimation of the case studies tax burden. The land cadastre values are obtained directly from the "Land Value Album for Mexico City" (DDF 1970). Construction values are specified on a table within the Album. In this table, buildings are classified by: a) construction quality (type of construction, its structure, materials, finishings and service installations) and b) construction age: old (low cost, average, good) and new (low cost, average, good, luxurious, walk-ups and high-rise buildings). The values for both land and construction are expressed in pesos per square meter ($/m2).

The ciudad perdida (case 1) can only have a tax levied on the land it occupies, since shanties are extra-legal shelters and are therefore not subject to taxation. Also, they are not taxed because of their precarious physical condition. The property (land) is taxed on its value basis, although it operates on a rental basis. Tax is levied on the entire property regardless of interior subdivisions.

The vecindades (cases 8, 9) can either be taxed on a rental or a value basis, depending on their legal status and whether with frozen rents or not. Rental basis has the disadvantage that property's "operating expenses" may be deducted for tax evasion purposes. Thus, the same property may be taxed much below the amount arrived at when capital value is taken as the basis. Tax is here estimated upon a property's value regardless of the expenses and number of apartments.

The colonias proletarias viejas (cases 5, 6) are normally taxed on a value basis, since in most cases they are owner occupied.

The new colonias proletarias (case 2) located in DF are generally taxed on a value basis. Colonias spread faster than the Cadastre Office can assess them; JALALPA was developed in 1971, but not until the second half of 1974 was the Cadastre Office assessing that locality and preparing the information for the 1975 Land Value Album. Colonias proletarias within the DF are temporarily tax exempt.

The State of Mexico has not yet implemented an effective fiscal structure for the fast growing Metropolitan Area. The basic problems being confronted are that privately developed new colonias are not provided with adequate service infrastructure, although developers had "promised" its implementation. Colonos (local community) refuse to pay taxes unless promises are fulfilled, especially since most have been paying for "urbanized " lots during a period of several years. With lack of services and property titles, which are not released because incompletion of amortization payments, social pressure is raised and developers hardly find a way to dissolve their firms or renew their "promises." Finally the Government is pressed to expropiate the colonias in order to legalize property ownership. And eventually, the Government will also provide the service infrastructure. Therefore, not until ownership is legalized and services finally provided, will the Government have the authority to impose its tax, and the community have the willingness to pay them in exchange. Squatter settlements that illegally occupy land, press hard for public recognition. Gradually, the Government will also legalize their land tenure and will provide them with basic services.

The Municipality of NETZAHUALCOYOTL (case 4) has not been appraised for taxation purposes, the reason for which the State's Cadastre Department applies the rate of 10/1000 on the basis of the 100% of property's fiscal value. (Dobner 1975:M) In LOMAS DE SAN AGUSTIN (case 3), properties have already been regularized and taxes are levied with the rate of 7/1000 over 75% of their cadastre value, which is the tax base used for urban properties in the State of Mexico. (Dobner 1975:M) Rental basis for taxation is not considered

in the State's fiscal legislation. Supposedly, the two colonias have only started paying their tax obligations since 1974.

Oldman found that in DF, the effective tax base was half the nominal base, but there is no information available on the effective tax base actually paid in the State of Mexico. Evidence indicates, however, that most new colonias continue struggling to obtain property legalization. Such a situation suggests that the majority of the low income population does not pay property taxes at all, which leads us to assume that the State's effective tax base is substantially lower than that stipulated by law.

In spite of the State of Mexico's effort in searching for a balance in tax treatment with the DF, the imbalance between their urban developments will remain for a long time. The principal factors are: a) the activity center of the Metropolitan Area is located within the DF, which for centuries has gradually built up its development, contrary to the State's explosive development during the last 3 decades, which lack a consistent service infrastructure; and b) the DF urban structure yields revenues from property tax that were 15 times higher than that of the State of Mexico; (Pichardo 1972:196) a relation that will likely continue disproportionately, principally because the State is absorbing the massive, but lower income, development of the Metropolitan Area.

The conjuntos habitacionales (cases 10, 11, 12) case studies located within the DF have another tax treatment. Since Government considers its housing as "social interest," they are temporarily tax exempt, according to the following stipulations: (Oldman 1967:50)

1. 15 years for dwellings completed before December 31, 1964 which rent $28 or less per unit.
2. 15 years for houses completed before December 31, 1964 that have a value of $6400 or less, or possess a mortgage of less than $4800.
3. 25 years for condominiums completed before December 31, 1964 with cost of less than $4800 per unit or rent under $28.
4. 20 years for multi-family dwellings completed before December 31, 1966.
5. 30 years for houses completed before December 31, 1966 for workers of a commercial enterprise.

Besides that, the Government offers partial temporary exemptions when:

6. Government employees borrow from ISSTE (Social Security for State Employees) in order to purchase or build their houses and receive exemptions equal to twice the value of the loan or $16,000, whichever is less.
7. Purchasers of homes built by the DDF (Government of DF) receive 50% exemption for 10 to 20 years.
8. The official properties, historical monuments and so on.
9. Properties of colonias proletarias (located in DF) are exempt from 0.5% of the nominal property tax for 10 years.

The case study of the early 1960's SAN JUAN DE ARAGON and the mid 1960's NONOALCO-TLALTELOLCO fall in the categories 2 and 4 respectively. The DDF Cadastre Office stated that early 1970's IZTACALCO tax criteria has not yet been defined. They suggested, however, that similar tax exemptions were likely to be applied.

For record purposes it is interesting to mention that besides the regular property tax, both the DF and SM have another tax on urban land: derechos de cooperacion (cooperation fees). These are charges imposed on properties benefited by municipal improvements, offsetting all or part of its cost. The improvements are usually water mains, sanitary sewers, storm drainage, pipelines connecting a subdivision to these central facilities, sidewalks, street pavement, public lighting, installation or repair of private plumbing connections, the cleaning of septic tanks, etc.

The Federal District has still another charge on urban land: impuesto de planificacion (planning tax). Its purpose is the recovery of projects costs for the opening, adjusting or enlarging of streets, avenues, in any right of way, parks and so forth. Tax is levied in each property depending on its size and its distance from improvement (influence index). The State of Mexico does not make a distinction between special assessment charges, so it considers them all under cooperation fees.

2.3 SERVICE EXPENSES:

Service expenses are here defined as the regular charges incurred in properties operation, mainly: water and sewerage, electricity and gas, power, heating,insurance, payrolls and management.

The low income population's regular expenses for housing operation concentrate on its services, basically water and electricity. The following table summarizes the service consumption by housing system:

T. 25: ESTIMATED ANNUAL CONSUMPTION RANGES: WATER AND ELECTRICITY*.

	WATER (M3)	ELECTRICITY (KWH)
CIUDADES PERDIDAS	-	-
COLONIAS NUEVAS	22 - 30	750 - 1050
COLONIAS VIEJAS	300 - 350	1500 - 1800
VECINDADES	90 - 120	300 - 400
CONJUNTOS	500 - 650	2400 - 2700

(*) CONSUMPTION PER SINGLE DWELLING UNIT.

SOURCE: TOTAL SERVICE EXPENSES ARE BASED ON RESEARCH INFORMATION. HOWEVER, THE CONSUMPTION DATA WAS DEDUCTED FROM ESTIMATED EXPENSE RANGES IN WATER (IN BASE OF 5 TO 8 CENTS PER M3. TARIFF SET BY TESORERIA DEL DISTRITO FEDERAL IN 1970-71); AND ELECTRICITY (IN BASE OF 4 CENTS PER KILOWATT-HOUR TARIFF, SET BY COMPANIA DE LUZ Y FUERZA DEL CENTRO SA., 1970-71). THE APPROXIMATE COST OF WATER BOUGHT AT RETAIL IS $2/M3, 1970-71 (NEW COLONIAS).

The very low income groups living in ciudades perdidas (case 1) rent unserviced land in accordance with their economic means. This subsistence group does not spend anything for services; instead, they provide themselves with water and electricity from public mains or power lines.

The colonias proletarias nuevas (cases 2, 3, 4) are not provided with adequate service infrastructure. Water is distributed by private "merchants" that circulate with water tanks inside the colonia. It is generally sold retail at an approximate cost of $1 per 500 liter tank; which is very expensive as compared with the DF's tariff of 5 to 8 cents per cubic meter (M3). Water is mostly used for cooking and washing. For bathing and other needs, colonos normally use the baños (public baths), which are frequently available within the colonia. The average 6 to 8 member household has an estimated annual expenditure on water that ranges from $44 to $60. Electricity is usually adequately supplied in low income colonias. The service is considerably inexpensive, approximately 4 cents per Kilowatt-hour (Kwh). The estimated annual expense in electricity is $30 to $42. Spending is relatively low because households have minimal electric installations and very few electric appliances.

The colonias proletarias viejas (cases 5, 6) are located in fully serviced urban areas. The average 6 to 8 member household spends $24 to $28 annually on water, depending on their household size and if they live in walk-up apartments or in row housing. Electricity consumption increases as households afford electrical appliances and the dwellings are provided with adequate electrical installations. The annual expenditures on electricity are estimated at $60 to $72.

The vecindades (cases 7, 8, 9) are similarly located in fully serviced downtown areas. Tenements have running water, but due to size, only kitchen sinks and sometimes toilets are included in each apartment. As in new colonias, the tenants make use of the baños for bathing and other needs. It is estimated that the typical 6 member family spends only $8 to $10 on water annually. Although available, electricity consumption is low due to the reduced apartment size which needs only few sockets. According to estimates, electricity consumption ranges from $12 to $18.

The conjuntos habitacionales (cases 10, 11, 12) offer adequate consumption ranges to its population. According to estimates, the 4-6 member family spends $40 to $50 annually in water. The annual electricity expenditures range from $96 to $108 for a 3 bedroom apartment. High consumption/expense is due to electrical appliances and adequate installations.

It should be noted that households living in new colonias consume 5 to 10 times less water than populations living in urban environments where water service is available. Ironically, these lower income groups have to spend up to 4 times more for water than better off populations living in old colonias or downtown vecindades, not to mention those living in Public housing.

2.4 FINANCING COSTS:

The costs and losses of low income housing operations are not included in this analysis due to a lack of consistent information in all case studies. This type of information refers principally to housing financing interest costs and to rental recollection losses.

However, it is considered of interest to point out the key aspects in the financing structure of Public and low income housing.

The public sector has a well defined criteria for housing financing which is usually channeled through Banco de Mexico's FOVI (housing fund institution). FOVI was designed to extend credit to banks on qualified social interest mortgage loans in order to assure commercial banks a continued liquidity. FOVI charges 6% interest for loans, to encourage banks to obtain funds from FOVI rather than from the sale of 8% certificates and bonds.

If FOVI intends to purchase qualified social interest mortgages, FOGA (credit guarantee fund) will advance and insure amortization payments for up to 18 months following the fourth monthly default by mortgager. FOGA will pay mortgage lenders 1% additional interest to 9% social interest loans. This subsidy intends to equalize the return on "social interest" loans for $6400 and $7600 housing units since credit of the last one is at a 10% interest rate.

FOVI requirements for financing social interest housing stipulate that units, including land and improvements, should not exceed a cost of $6400 (modified to $7600 in 1974), and the purchaser should have an annual income below $2800 ($5184 in 1974). (FOVI 1974: 10-15, CIHAC 1972) Land cost should not exceed 35% of the dwelling's total value. 20% of income should be devoted to housing and not more than 25%. A 20% downpayment is normally required. There is regularly a 15 year loan repayment period and a ceiling of 9% interest rate. It offers the option of constant, declining or increasing plans of amortization. (FOVI 1974:13, BNH 1970:123)

Banking institutions thus offer "social interest" mortgages at 9% interest on individual loans and 10% for contractors or developers (increased by one point in 1974). Instead of selling or discounting mortgages to invest their capital, banks "sell" mortgage certificates (cedulas hipotecarias) and mortgage bonds (bonos financieros) in the private market. Both

are sold at 8% interest. The difference in the two types of issues lies in the fact that banks are intermediary and guarantee the certificates with Banco de Mexico's funds (for the benefit of holders in case of borrowers default), while in the bonds case, the banks are recognized as the true issuers and holders do not have a security of interest in the mortgage property supporting the bond. Through these operations, private banks will retain a minimum of 3 points as their commission.

The savings and loan banks are another important source of housing financing in Mexico City, yet not as resourceful as the commercial banks. Their interest rates are normally 4 1/2% on individual deposits and 4% on group deposit. They offer 8% on both individual and group loans and as little as 6% on group loans with FOGA support. Banks limit credit to depositors who are subscribed in contract and have saved approximately 25% of the required loan over a period of time. Loan is generally repayable in 10 years.

Finally, the savings departments of private banks pay a little less than 4 1/2% on regular accounts. Special depositors have priority in obtaining mortgages from the banks. (Oldman 1967:190)

But low income housing is financed otherwise. In general, low income population is not subject to the above mentioned credit facilities principally because: a) they fail to earn the minimum stipulated income; b) they do not own "urbanized" property which is normally regarded by banking institutions as the adequate collateral for loans.

Private developers of new colonias proletarias, after tracing land subdivisions, start selling lots to generate cash flow. Developers try to obtain loans from banking institutions in order to improve the development. But banking institutions do not regard speculative developments as "social interest." When obtained, loans bear commercial interest rates, which may run as high as 16%, depending on the amount and the collateral's characteristics. Since low income population is not credit worthy, developers offer them simple financial schemes which require 5-10% downpayment (and sometimes not even required), and average a 10 year repayment period and low monthly "quotas" of $14 to $28. To lessen the economic burden (and secure payments) these monthly quotas are sometimes collected in weekly installments. Since property is never fully improved, low income purchasers, in reality, end up paying more for what they receive, i.e. an estimated interest rate of over 20%. However, purchasers normally do not release ownership titles. It is well known that when households default, after missing 3 monthly payments, the property is again sold by developers. This procedure brings complications, since the same property may in the future be claimed by 2 and even 3 "owners." Despite inconveniences, it should be recognized that speculative developers play an important role in financing low income housing, since only they wil "risk" to offer credit to the city's most economically unstable population.

In land subdivisions, squatters normally do not have any property expenses, except perhaps an initial quota for the community leader who is responsible for the subdivision and distribution of land. In some cases, however, the invasion to ejidal land is arranged when squatters agree to pay monthly quotas to ejidatarios, which see them as a source of income.

In both cases, the Government is pressed to intervene and eventually "solve" the communities' most serious defficiencies.

The colonias proletarias viejas instead, do not generate financial costs or expenses, since properties have already been paid for.

The vecindades are usually deteriorated and have already been depreciated in full. Owners have collected

rents for decades without investing in property maintenance, especially in those with frozen rents. Since tenements are stagnant housing situations, loans are rarely granted for their improvement.

Finally, in the case of ciudades perdidas, since the occupants have no legal status, land owners do not declare the property's gross revenues.

2.5 TRANSFER COSTS:

Although property transfer costs are not "regular" expenditures on housing, it is important to observe how they are levied since they, too, have a direct impact on low income population's attempt to purchase property. This is especially true in the case of new colonias proletarias.

The transfer of real property in the Federal District has the following taxes, charges and procedures:

- The real property transfer tax (impuesto sobre translacion de dominio de bienes immuebles) is imposed on transfers of title to or of co-ownership interests in realty situated in the DF.
- Notarial fees: transfer land is subject to various recording and notarial fees. Most of these are flat charges (i.e. approximately $16) regardless of the property value. In brief, the several charges and fees impose transfer costs of approximately 25% of value of properties of $80, 6% for $400, 1% for $400 to $8,000 and 0.5% from $16,000 to $80,000.
- The Federal stamp and capital gain taxes vary from 2% for properties up to $4,000 in value to 5% for properties exceeding $60,000.

The transfer tax, stamp tax, notarial fee and recording charges normally amount to 5-7% of the appraised value of properties worth from $4,000 to $80,000; and may reach 20% or even 30% for inexpensive parcels of less than $4,000 (Oldman 1967:133). This represents a heavy burden for most low income households, who, having amortized their properties for a decade or so, are obliged to make a final expense in order to legally possess their properties.

Not until property titles are in order and up to date in tax payments, may banking institutions consider them adequate collateral for a loan.

It seems that low income populations have very few possibilities of incorporating themselves into the economic system, since they end up paying proportionately more for living in the Metropolitan Area, than do higher income groups.

In Public housing projects, property transfers normally operate through housing certificates. The certificados de vivienda are designed to give simplified rights to immediate possession of transferred property and automatic title upon payment of all requirements. In case of default, refunds of payments of all installments are made to the purchaser, but the agency retains the interest of such installments.

Public housing purchasers have security in investment, while lower income groups that engage in the purchase of non-urbanized lots have, in case of default, no guarantee in recovering their payments.

1. ECONOMIC VALUATION MATRIX: NET REVENUE

Category	Population per Category	% of Total Population	LOCALITIES	USERS: Income: Household Annual Income Range ($)	PROPERTY: Number: Units per Land/Lot (#)	PROPERTY: Value: Cadastre ($)	PROPERTY: Value: Commercial ($)	PROPERTY: Revenue: Annual Gross Revenue ($)	NET REVENUE: Average Annual Operating Expenses: Maintenance ($)	Taxation ($)	Services ($)	Total ($)	NET REVENUE: Gross Revenue Less Operating Expenses ($)	INDICATORS: Ratio: Expenses out of Income (%)	Gross Revenue of Net Revenue (R)
A	200,000	2.3	1. Buenos Aires	-432	189	209 556	221198	19278		1048		1048	18 230		1.05
			2. Jalalpa	432-720	1		2100	180		TE	56	56	124	7.8	1.45
			3. Lomas San Agustin	432-960	1		3168	240		NT	64	64	176	6.7	1.36
B	2,300,000	26.7	4. Netzahualcoyotl	720-1200	1		4192	288		NT	78	78	210	6.5	1.37
			5. Pro-Hogar	1920-2400	1	7295	9370	432	30	36	58	124	308	5.2	1.40
C	1,000,000	11.7	6. Vallejo	1296-1920	4	15400	18760	1344	77	77	184	338	1006	4.4	1.34
			7. Las Vizcainas	1440-1680	58			7656	580	TE	2030	2610	5046	2.7	1.52
			8. Tepito-Casa Grande	1440-2160	157	281688	296186	26376	1570	1408	5338	8316	18060	2.5	1.46
D	2,000,000	23.2	9. Tepito-La Florida	1296-1680	46	70052	71606	6624	460	350	1472	2282	5152	2.9	1.29
			10. San Juan de Aragon	2640-3120	1		7632	420	44	TE	74	118	302	3.8	1.39
			11. Iztacalco	2880-3600	NA		8212*	476	38	TE	88	126	350	3.5	1.36
E	500,000	5.8	12. Nonoalco Tlaltelolco	2640-3360	NA		9408*	504	38	TE	92	130	374	3.9	1.35
	6,000,000	69.5	TOTAL	Note: NT=Not Taxed, TE=Tax Exempt, (*)=Apartment Unit Only.											
		30.5	Middle-High Income												
	8,634,000	100.0	TOTAL METROPOLITAN POPULATION												

SOURCES:
- *Direccion de Catastro e Impuesto Predial (1970), Album de Valores... op.cit.*
- *Hipotecaria Bancomer SA (1974), Album de Valores... op.cit.*
- *Ring A. (1970), The Valuation of Real Estate, Englewood Cliffs N.J., Prentice-Hall Inc,p.219*
- *Oldman O. et al. (1967), Financing Urban Development in Mexico City, Cambridge Mass.,Harvard Univ. Press, p.50-54*
- *Dobner H.K.(1975), Memorandum, Departamento de Catastro. Subdireccion de Egresos. Gobierno del Estado de Mexico, Marzo*
- *Brown J.C.(1972), Patterns of...op.cit. p.103,188*
- *Vives J. et al.(1972), Informe sobre las Condiciones Psico-socio-antropologicas de San Rafael Chamapa, Naucalpan Edo. Mex., Instituto AURIS, p.w/n on households living expenditures.*
- *Instituto AURIS (1972), unpublished material on low income population living expenditures.*
- *Physical Data Matrix*
- *Economic Data Matrix*

3. NET REVENUE:

Two observations can be made regarding the housing expenditures, analysis: a) estimations indicate "average" expenditures, and b) the analysis focuses on "regular" expenses. Any other expenditure may be considered occasional (e.g. sporadic improvements on the environment) or part of the household's settlement process (e.g. dwellings gradual construction).

The case studies were appraised considering property's legal status--regardless of the number of dwellings they contained. For example, in subdivisions, properties consist of a dwelling/lot unit, while in rental situations, properties consist of several dwellings per lot.

Since appraisals were based on the properties, the housing operating expenses refer to the property as well. But in order to establish a base for comparison among the different housing situations, it was necessary to translate the values and expenditures in terms of a single dwelling unit.

It is found that the low income population spends on their housing's operation from 25% to 30% more of what they already spend in rents or amortizations. The only exceptions are the ciudades perdidas whose population doesn't have resources for extra spending. The operating expenses increase the household's economic burden by:

T. 26: HOUSING OPERATING EXPENSES.
(%) OF HOUSEHOLD'S INCOME

	HOUSING SYSTEMS	(%)
VL	CIUDADES PERDIDAS	-
L	COLONIAS NUEVAS	6 - 8
L/ML	COLONIAS VIEJAS	4 - 6
L/ML	VECINDADES	2 - 3
ML/M	CONJUNTOS	3 - 4

SOURCE: INSTITUTO AURIS, BASED UPON UNPUBLISHED INFORMATION ON LOW INCOME HOUSEHOLD'S EXPENDITURES. VIVES J. ET AL., INFORME SOBRE LAS CONDICIONES... OP.CIT.UNNUMBERED PAGE. BROWN JC., PATTERNS OF ... OP.CIT., P.103,108. CASE STUDIES RESEARCH INFORMATION.

Housing operating expenses do not represent a burden on the population living in vecindades and conjuntos since they normally allocate up to 15% of their income for housing rents or amortizations. The population living in colonias viejas will end up with an economic burden equivalent to 20% of their income. But the most affected income groups are those living in new colonias. Their high operating expenses place them in a fragile economic position. The amortization of property already consumes up to 25% of their income; furthermore, their operating expenses increase the economic burden to 30% of their income and more. (see Economic Valuation Matrix: Net Revenues).

Property taxes are not an economic burden in low income housing. Properties are usually tax exempt, or taxation comes 15 years after the colonias settlement when they are officially recognized and some services are provided.

The major housing operating expense is in services. These represent 60% to 100% of housing's expenditures.

2. ECONOMIC VALUATION

1. ECONOMIC CONDITIONS

This second section is an attempt to define low income housing performance with regard to Metropolitan Mexico's financial and real estate markets.

The following table summarizes Mexico's financial conditions in the mid 1970's, which are used as the base for the present analysis. Information on the late 1974's conditions are given as a reference for change. Data is net after taxes.

T. 27: FINANCIAL RETURNS OF MEXICO.

	1970	1974
MORTGAGE MARKET:		
MORTGAGE BONDS	8%	8 1/4%
MORTGAGE CERTIFICATES	8%	8 1/4%
CERTIFICATES OF DEPOSIT	8%	8 1/4%
FINANCE MARKET:		
FINANCE BONDS	9%	8 3/4%
FINANCE CERTIFICATES	9%	8 3/4%
NOTES *	9%	10 1/2%
CERTIFICATES OF DEPOSIT **	-	10%

(*) LESS THAN $80,000
(**) LESS THAN $80,000, 6 MONTHS

SOURCE: BANCO DE MEXICO SA.,"INDICADORES ECONOMICOS",MEXICO DF, GERENCIA DE INVESTIGACION ECONOMICA, 1974,(DIC.), VOL.III, NO.1, P.14.

The conditions of the economy has significantly deteriorated in past years, whereas the double digit inflation of the country in the late 1960's was 10%-15%, it had reached alarming levels (20%-25%) by the end of 1974. (BM 1974:28)

The impact of these economic conditions on property values is difficult to determine. It is observed, however, that as inflation increases, so does property value; not only because the purchasing power of money is decreasing, but because people that have savings are willing to invest in real estate.

However, there is a level at which the property values tend to stabilize. This is the level where properties and their environment do not offer potential for immediate improvements. For example, this is the case of properties that are not improved and seem especially far from obtaining improvements; or the case of properties that have improvements but require heavier investments to obtain an increase on their actual revenues.

The economy and the population's socio-economic development influence the Metropolitan Area land market.

The high demographic growth of Metropolitan Mexico, actually concentrated in State of Mexico's suburban areas-, has rendered dramatic land demand for low income settlements. The intense demand has had a direct impact on the Metropolitan land market. Land has become a prime source for speculation.

Based on the real estate information collected throughout the years by Hipotecaria Bancomer, SA, some general land market behavior patterns have been identified:

a) Land values correlate with distance from the city center (location), with density and with population's income. (see ch. 3.4)

b) Land value relates to the Metropolitan Area's development process. Land increases in value at dif-

ferent rates in different parts of the city. It was found that in the periphery, land increases in value at a higher rate than in central areas. The following table summarizes the Metropolitan land value dynamics:

T. 28: METROPOLITAN MEXICO: LAND VALUE DYNAMICS. 1970.

		LAND VALUE	
		AVERAGE ($/m2)	INCREASE RATE (%)
VL	CIUDADES PERDIDAS	40 - 60	8 - 10
L	COLONIAS NUEVAS	4 - 24	15 - 40
L/ML	COLONIAS VIEJAS	20 - 40	10 - 15
L/ML	VECINDADES	40 - 100	8 - 12
ML/M	CONJUNTOS	24 - 60	5 - 15

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES...OP.CIT. TABLE 20.

The land value increase data from the case studies, can also be represented in graphical form, in agreement with the above table. (see G. 15)

Note that unstable low land values belong to peripheral colonias proletarias (cases 2,3,4). When fraccionamientos (subdivisions) opened to housing market, in some cases the intense demand stimulated the increase in land values up to 40% during the first years. (Turner 1971:IV-11) As lots sell out, their scarcity keeps values high but their value increase rate gradually diminishes.

The rate of increase tends to stabilize when it reaches the limit of what people can afford and are willing to pay. In low income settlements, it is observed that rates begin to stabilize when land values reach approximately $24/m2. (1970-71)

In downtown vecindades and ciudades perdidas (cases 1,7,8,9), land values are high and their capitalization is stabilized at low rates. Properties do not experience higher rates because of an area's stagnant condition and its legal constraints. (i.e., rent controls, construction regulations) In other words, property capitalization is below current inflation rates.

The colonias proletarias viejas (cases 5,6) also have stabilized values and rates. Their capitalization rates are higher than those of downtown areas, because they respond more freely to market forces. (i.e. they have less legal constraints)

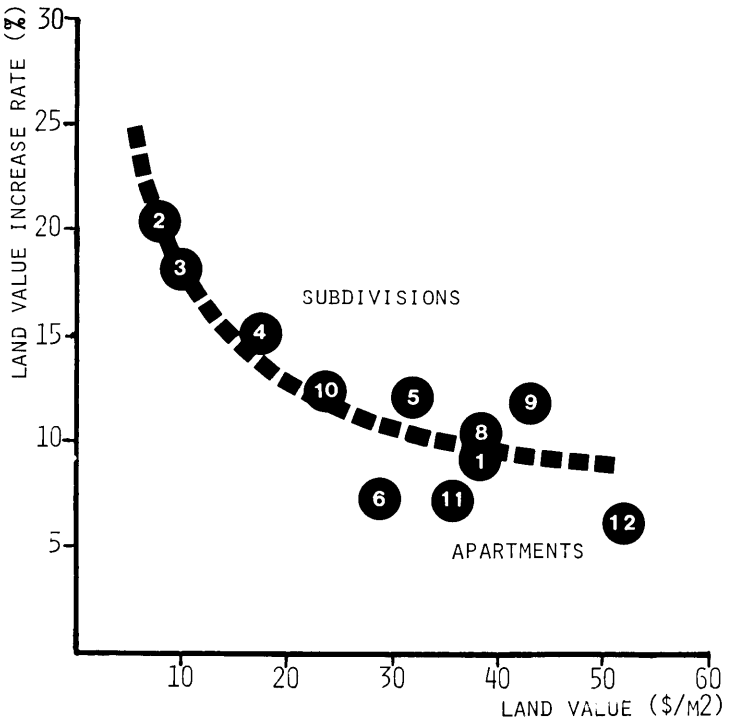
The central locations have land values stabilized at $40 to $100/m2 with a 5% to 10% capitalization rate. The information on the intermediate ring cases shows stable values at $20 to $40/m2 with an 8% to 12% annual land value increase.

In Public row housing projects, land values increase at rates similar to those of colonias viejas, in spite of their differences in construction quality and environments. In either case, a land value increase stimulates a consequent increase in dwelling's value, which eliminates these housing alternatives from the lower income market. On the other hand, the upper-low income population could afford and could likely prefer to purchase "new" dwellings (along with its credit facilities), instead of purchasing "old" dwellings at similar prices. It seems that both colonias viejas and Public row housing are "blocked" in the housing market. That is, the increase in land value has affected property values to such a degree that they are now too expensive for what the low income groups demand.

Public housing walk-ups and high-rise condominiums respond in a different way to the housing market. In first place, most purchasers are still paying for

their dwelling and are unwilling to sell or transfer it. It has been observed that the number of apartment turnovers is not significant. Furthermore, Public housing stock is rather fixed, i.e. aside from the housing market. Secondly, temporary tax exemptions distort housing values and have a negative impact on demand, since more expensive dwellings are placed on the housing market at competitive prices.

G. 15: LAND VALUE CAPITALIZATION RATE. 1970-1971.



SOURCE: HIPOTECARIA BANCOMER S.A., ALBUM DE VALORES DE ..., OP.CIT. ECONOMIC DATA MATRIX.

The information on walk-ups and high-rise buildings shows that dwellings have different value dynamics. High-rise multi-family housing has a capitalization rate equivalent to approximately half (5% to 6%) the average rate of properties which include land.

(G.15) The capitalization rate of walk-up housing is slightly higher than that of high-rise buildings: 7% to 8%.

The following valuation is concerned with property's financial success, analyzing its rate of return, its estimated value and its imputed revenue, using competitive market rates. Taking the mortgage and the real estate capitalization rates as an analysis tool, the information to be obtained will suggest a level of economic efficiency in low income housing.

2. RATE OF RETURN:

The appraised values and net revenues of case studies have been defined in the preceding section. (see Ch. 3.3,4.1) In base of this information, the rate of return of properties is obtained by dividing their annual net revenue by their appraised value:

$$\% * = \frac{n\,R}{a\,V}$$

where: % = rate of return
nR = annual net revenue
aV = appraised value

The ratio (*) -given here in percentage form- will help identify the property's financial performance. The figures obtained may then be compared with current mortgage rates. (see Economic Valuation Matrix: Rate of Return) The rates of return found in low income housing are as follows:

T. 29: ESTIMATED RATE OF RETURN. 1970.

	HOUSING SYSTEMS	(%)
VL	CIUDADES PERDIDAS	8 - +
L	COLONIAS NUEVAS	5 - 6
L/ML	COLONIAS VIEJAS	3 - 5
L/ML	VECINDADES	6 - 8
ML/M	CONJUNTOS	4 - 5

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES...OP.CIT. BAZANT J. ET AL., URBAN DWELLING ENVIRONMENTS...OP.CIT. ECONOMIC DATA MATRIX. ECONOMIC VALUATION MATRIX: NET REVENUES. TABLE 27.

In a way, the high returns obtained in ciudades perdidas, confirm the fact that rents paid by subsistence groups are far above what they receive in exchange. Owners obtain revenues with no investment in property. Revenues justify property's location.

The vecindades also yield high returns. Although apartment rents are low, due to the large number of dwellings per tenement, a considerable revenue is accumulated.

Only ciudades perdidas yield returns that are comparable to or higher than the current mortgage rates. Vecindades yield lower returns. In both cases, the returns are considerably lower than the annual value increase of properties.

Public housing has mediocre returns. This results from comparing dwelling's high values (subsidized) with their low net revenues. Although the case studies correspond to different housing types, their rates of return are within a similar range.

The colonias viejas yield the lowest return in the low income housing market. This is due to the fact that property values (during the last decades) have increased substantially more than have the revenues they produce.

In colonias nuevas, rates are low due to the population's meager ability to pay. Nonetheless, low returns are compensated for by the benefit that properties obtain their high capitalization rates, this beign the properties' real return. With time, this rate is limited as dwellings are completed and localities are improved, thus increasing property values.

In general, low income housing returns are below market rates, especially for those urban environments which are improved. In other words, it is obvious that properties having the least investment and minimum regular expenses are yielding higher returns.

A strong economic imbalance is identified in the housing systems analyzed. Since the low income urban environments are responding inefficiently to the population's housing needs, it is suggested that the city itself (or the local Government) subsidize this inefficiency.

3. ESTIMATED VALUE:

The net revenues of case studies used in this analysis intends to relate the net revenue to the market rates of return. The figures obtained will reflect what property values ought to be, according to their net income and/or market rates. (The difference between appraised and estimated value, will indicate the market value discrepancies in low income properties.) An estimate of a property's value is obtained dividing its assumed market rate into its actual net revenues:

$$e\,V = \frac{n\,R}{\%^*}$$

where: e V = estimated value
n R = annual net revenue
% = market rates

Two approaches are considered for this evaluation(*): 1) a rate considered to be the current mortgage rate (opportunity rate), and 2) the rate base upon the property value increase as depicted in G. 15 (real estate capitalization rate). The following table summarizes the dwelling value ranges:

T. 30: ESTIMATED DWELLING VALUES. 1970.

	VALUES		
	APPRAISED ($)	OPPORTUNITY ($)	REAL ESTATE ($)
CIUDADES PERDIDAS	- 1400	- 1000	- 1000
COLONIAS NUEVAS	2000 - 4400	1500 - 3000	500 - 2500
COLONIAS VIEJAS	4400 - 10000	3000 - 4000	2500 - 3500
VECINDADES	1400 - 2000	1000 - 1500	1000 - 1500
CONJUNTOS	4400 - 12000	4000 - 5000	2500 - 6000

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES...OP. CIT. BANCO DE MEXICO SA, INDICADORES...OP.CIT.,P.14. TABLES 21,27,G-15. ECONOMIC EVALUATION MATRIX.

The values obtained through both approaches average 30% to 50% less than those values obtained through direct appraisal of properties. This basically reflects the disproportionately low returns of low income housing. (see Economic Valuation Matrix: Estimated Value)

In ciudades perdidas (case 1) and in vecindades (cases 8,9) the real estate capitalization rate is 1% or 2% above mortgage rates. This small difference results both from these properties' stabilized values and their relatively constant net revenues.

In colonias nuevas (cases 2,3,4), the values obtained through opportunity rates are low since the household's investment on their dwelling is limited. To the contrary, due to speculation, the colonias experience very high real estate returns, especially when properties are purchased at low values.

The improved colonias (case 5) and Public housing subdivision (case 10), show similar value ranges, because both have analogous dwelling characteristics, lot dimensions and service infrastructure quality. As a result, properties' appraised values are very high. In contrast, the values estimated through opportunity/real estate rates are very low, since properties yield below market returns.

Apartments in colonias (case 6) and in Public housing (cases 11,12) show different real estate behavior. These housing situations are the only cases where mortgage rates are higher than properties' own value increase. Consequently, land subdivisions have a greater real estate return than apartments.

It appears that there is an inconsistency between appraised values and values determined by the mortgage and real estate markets. Mortgage markets normally yield 2,3 and even 4 points more than low income properties. This information suggests that the low income population lives in dwelling environments whose market value is considerably higher than what they are paying for its ownership or use.

4. IMPUTED REVENUE:

This section is based upon the appraised value of properties. (see Ch. 3.3) The estimated revenues will reflect how much properties ought to yield according to their values. The difference between actual and estimated revenues will suggest the financial discrepancies of low income properties. The imputed revenue is obtained by multiplying the property's appraised values by assumed market rates.

$$i\ R = a\ V\ (\ \%^{*}\ )$$

where: i R = imputed revenue
a V = appraised value
% = market rates

For comparative purposes, the same two rates will be used (*):

a) the current mortgage market rate (opportunity rate), and

b) the rates based upon the property values increase as depicted in G. 15 (real estate capitalization rate). The following table summarizes the imputed revenues:

T. 31: ESTIMATED IMPUTED REVENUES. 1970.

	ANNUAL REVENUES		
	ACTUAL ($)	OPPORTUNITY ($)	REAL ESTATE ($)
CIUDADES PERDIDAS	- 100	- 100	- 100
COLONIAS NUEVAS	150 - 300	150 - 400	400 - 800
COLONIAS VIEJAS	300 - 450	400 - 750	200 - 1200
VECINDADES	100 - 200	100 - 150	100 - 200
CONJUNTOS	400 - 500	600 - 800	500 - 1000

SOURCE: HIPOTECARIA BANCOMER SA, ALBUM DE VALORES... OP.CIT. BANCO DE MEXICO SA, INDICADORES...OP.CIT.P.14. TABLES 16,27,G-15. ECONOMIC DATA MATRIX.

Actual net revenues are up to 200% below those revenues which properties could yield with opportunity rates or from their own capitalization (speculation). (see Economic Valuation Matrix: Imputed Revenue)

Ciudades perdidas (case 1) and vecindades (cases 8,9) show little difference between properties' actual return and their opportunity returns. This results from properties saturation of rental accomodations.

Peripheral colonias proletarias (cases 2,3,4), however, show strong discrepancies between actual and imputed revenues. Property's opportunity revenues are up to 30% higher than actual revenues, which suggests that properties could eventually yield greater returns in the mortgage market than they yield in reality. But the revenues obtained through their capitalization rates are much higher (up to 200%) than actual revenues. These sharp differences are the result of high land value increase rates. They suggest how much low income purchasers benefit with property value added; but these rates also suggest how much profit speculators obtain.

In the intermediate ring subdivisions (case 5) and Public row housing (case 10), the imputed revenues obtained through opportunity rates are 30% to 60% higher than actual revenues. This indicates that properties' return are at below market level. When estimated with their capitalization rates, the revenues obtained are 250% higher than actual revenues. The difference between estimated and actual revenues is a consequence of their high value. The population receives the benefit from property value added without proportionately returning its value worth. Properties are already expensive, so speculation forces do not rule its value, as in the case of colonias nuevas.

The actual revenues of apartments in walk-ups (cases 6,11) and high-rise buildings (case 12), are up to

2. ECONOMIC VALUATION MATRIX: RETURN, VALUE, REVENUE

Category	Population per Category	% of Total Population	LOCALITIES	USER	PROPERTY				VALUATION					INDICATORS							
				Income	Number	Rate	Value	Revenue	Rate of Ret'n	Estimated Value		Imputed Revenue		Ratio	Rate of Return		Estimated Value		Imputed Revenue	
				Households Annual Income Range ($)	Dwelling Units per Land/Lot (#)	Real Estate Capital'n Rate (%)	Commercial ($)	Annual Net Revenues ($)	Net Revenues/ Prop'ty Value (%)	8% Opportunity Rate ($)	5% - 20% Real Estate Capital'n Rate ($)	8% Opportunity Rate ($)	5% - 20% Real Estate Capital'n Rate ($)	Difference: R.E. Rate - Opp. Rate (%)	Difference w/ Opp.Rate (%)	Difference w/ R.E.Rate (%)	Opp.Value of Comm.Value (R)	R.E.Value of Comm. Value (R)	Net Revenue to Opp. Revenue (R)	Net Revenue to R.E. Revenue (R)
A	200,000	2.3	1. Buenos Aires	-432	189	9	221198	18230	8.24	227875	202556	17676	19908	1	+0.24	0.76	1.03	0.92	0.97	1.09
			2. Jalalpa	432-720	1	20	2100	124	5.90	1550	620	168	420	12	-2.10	14.10	0.74	0.30	1.35	3.38
			3. Lomas San Agustin	432-960	1	18	3168	176	5.56	2200	978	253	570	10	-2.44	12.44	0.69	0.31	1.44	3.24
B	2,300,000	26.7	4. Netzahualcoyotl	720-1200	1	15	4192	210	5.01	2625	1400	335	629	7	-2.99	9.99	0.63	0.34	1.60	3.00
			5. Pro-Hogar	1920-2400	1	12	9370	308	3.29	3850	2567	750	1124	4	-4.71	8.71	0.41	0.27	2.44	3.65
C	1,000,000	11.7	6. Vallejo	1296-1920	4	7	18760	1006	5.36	12575	14371	1501	1313	-1	-2.64	1.64	0.67	0.77	1.49	1.31
			7. Las Vizcainas	1440-1680	58	–	–	5046	–	–	–	–	–	–	–	–	–	–	–	–
			8. Tepito Casa Grande	1440-2160	157	10	296186	18060	6.10	225750	180600	23695	29619	2	-1.90	3.90	0.76	0.61	1.31	1.64
D	2,000,000	23.2	9. Tepito La Florida	1296-1680	46	11	71606	5152	7.20	64400	46836	5728	7877	3	-0.80	3.80	0.90	0.65	1.11	1.53
			10. San Juan de Aragon	2640-3120	1	12	7632	302	3.96	3775	2516	610	915	4	-4.04	8.04	0.49	0.33	2.02	3.03
			11. Iztacalco	2880-3600	NA	7	8212*	350	4.26	4375	5000	657	575	-1	-3.74	2.74	0.53	0.61	1.88	1.64
E	500,000	5.8	12. Nonoalco Tlaltelolco	2640-3360	NA	6	9408*	374	3.99	4675	6233	753	564	-2	-4.01	2.01	0.50	0.66	2.01	1.51
	6,000,000	69.5	TOTAL	Note: (*)=Apartment Value Only																
		30.5	Middle-High Income																	
	8,634,000	100.0	TOTAL METROPOLITAN POPULATION																	

SOURCES:
- *Hipotecaria Bancomer SA (1974), Album de Valores... op.cit.*
- *Banco de Mexico (1974), Indicadores Economicos... op.cit., p.14*
- *Ring A.A. (1970), The Valuation of... op.cit., pp.205,232*
- *Physical Data Matrix*
- *Economic Data Matrix*
- *Economic Valuation Matrix: Net Income*

100% below their estimated opportunity/real estate revenues. The difference suggests that condominiums benefit less from value-added than properties which include land.

5. INDICATORS

5.1 RATE OF RETURN:

When comparing actual rates of return with: a) opportunity mortgage rates, and b) real estate capitalization rates; some patterns regarding low income housing financial performance are identified. The following table shows the difference between actual and market rates:

T. 32: INDICATORS: RATE OF RETURN DIFFERENTIALS.

	OPPORTUNITY (%)	REAL ESTATE (%)
CIUDADES PERDIDAS	0 - +	0 - 1
COLONIAS NUEVAS	(N)2 - (N)3	10 - 15
COLONIAS VIEJAS	(N)3 - (N)4	1 - 10
VECINDADES	(N)1 - (N)2	3 - 4
CONJUNTOS	(N)4 - (N)5	2 - 10

SOURCE: TABLES 27,28. ECONOMIC VALUATION MATRIX II. (n)=NEGATIVE. RESULTS ARE OBTAINED BY SUBSTRACTING FROM THE ACTUAL RATE OF RETURN, 8% OPPORTUNITY RETURN AND 5% TO 20% REAL ESTATE RETURN.

The ciudades perdidas are the only housing situation whose rates of return are above current mortgage market rates. Since property values are stabilized, their actual returns are within similar ranges as those returns estimated with their capitalization rates.

All the other housing systems yield rates that are below the mortgage rates. The vecindades rates are about one point below mortgage market rates. Differences start to accentuate as properties increase in value. The difference in new colonias is 2-3 points; in old colonias 3 to 4 points; and in Public housing, rates are the lowest: 4 to 5 points below the mortgage rates. In other words, the housing situations analyzed operate with approximately 50% to 70% of their economic capacity.

5.2 ESTIMATED VALUE:

When comparing the properties' appraised values with values estimated through: a) current mortgage rates, or b) real estate value-added rates; some economic characteristics are identified with regard to the dwelling value market. The next table summarizes the differences between actual and estimated values:

T. 33: INDICATORS: DWELLING VALUE DIFFERENTIALS.

	OPPORTUNITY (R)	REAL ESTATE (R)
CIUDADES PERDIDAS	1.00 - +	.90 - 1.00
COLONIAS NUEVAS	.60 - .80	.30 - .40
COLONIAS VIEJAS	.40 - .80	.30 - .80
VECINDADES	.80 - 1.00	.60 - .90
CONJUNTOS	.40 - .60	.30 - .80

SOURCE: TABLES 27,29. ECONOMIC VALUATION MATRIX II. RESULTS ARE OBTAINED BY CONSIDERING 1.00 FOR ACTUAL PROPERTYS' VALUES AND SUBSTRACTING VALUES OBTAINED THROUGH 8% OPPORTUNITY RATE AND 5% TO 20% REAL ESTATE CAPITALIZATION RATES.

The ciudades perdidas appraised values are within similar ranges as those values obtained using mortgage and real estate rates.

In contrast, all the other housing systems have differences between actual and estimates values, which mainly result from fluctuations in properties' capita

lization rates.

It is observed that the higher the capitalization rates, the stronger the actual/estimated value differences that result. In peripheral colonias, the difference is due to property's low net revenues, as compared to its high value increases. As value-added rate decreases (tending to stabilize), so does the differences between property values.

5.3 IMPUTED REVENUE:

When comparing the properties' net revenues with revenues obtained through a) mortgage opportunity rates, and b) real estate value-added rates; it helps clarify what low income housing is failing to yield.

T. 34: INDICATORS: IMPUTED REVENUE DIFFERENTIALS.

	OPPORTUNITY (%)	REAL ESTATE (%)
CIUDADES PERDIDAS	- 0	- 10
COLONIAS NUEVAS	30 - 60	200 - 250
COLONIAS VIEJAS	60 - 150	30 - 300
VECINDADES	0 - 30	10 - 70
CONJUNTOS	150 - 200	50 - 200

SOURCE: TABLES 27,31. ECONOMIC VALUATION MATRIX II. RESULTS ARE OBTAINED BY CONSIDERING 100% FOR PROPERTYS' ACTUAL NET REVENUES AND SUBSTRACTING FROM THEM, THE REVENUES OBTAINED WHEN APPLYING 8% OPPORTUNITY RATE AND 5% TO 20% REAL ESTATE CAPITALIZATION RATES.

The principal reason why low income housing systems are inefficient economically, is because revenues (i.e. housing rents, less operating expenses) are very low in regard to their values.

The exceptions are the ciudades perdidas and the

vecindades who yield high revenues in regard to properties' low services and construction qualities.

Theoretically, it can be assumed that properties should yield revenues at least equivalent to current mortgage rates. In reality, our information suggests that: a) actual revenues are below mortgage market returns, and b) actual revenues do not increase at the same rate as properties' capitalization rate.

It is observed that economic imbalances appear in peripheral inexpensive properties as well as in expensive properties in the intermediate ring and Public housing.

The revenues which low income housing could yield are as follows: Apartments' revenues are 30% to 60% lower than what they are capable of returning. In subdivisions however, properties could yield up to 200% of their actual returns. Theoretically, the value of properties could at least duplicate the revenues they yield at the present time.

3. GRAPHIC EVALUATION

This section deals with graphic comparison of the main economic characteristics of low income dwelling environments. Graphs are based upon the material analyzed in the previous sections.

3.1 ECONOMIC VALUATION: RENTS, OPERATING EXPENSES

Apparently there is no relation between housing rents and dwelling values, nor it seems exists a relation between rents and household's income.

It is observed that in the different housing situations analyzed, household's annual income represents between 30% to 40% of their dwelling's value; except in the case of vecindades tenants whose annual income exceeds property's value. Although the income-value pattern is rather constant, when rents are compared to income, some variations are identified. At lower incomes, population tends to spend more on housing rents, than higher income population.

Besides rents, low income population needs to spend money on housing services, maintenance, and taxes. These additional operating expenses increase the housing burden to up to 8% of the household's income. It may be observed in the graphs that at lower incomes the operating expenses absorb a greater percentage of the household's income than do higher income households. Expenses center mostly around dwelling services and facilities. Maintenance is generally insignificant, as are property taxes.

3.2 ECONOMIC VALUATION: RETURNS, VALUES, REVENUES

In order to show property's basic economic relations, their actual characteristics (return, value, revenue) were compared to a constant 8% opportunity rate.

The mortgage market rate commonly yields 8% rate for housing operations. In simple terms, this rate represents the conventional return for capital investments. In this study, considering property as a potential capital asset, this rate is assumed as property's economic return.

There is a direct correlation between property's return, its value and its revenue. The first series of diagrams, returns, indicate which properties are actually yielding (shaded squares) as compared with the constant mortgage returns (dotted squares). Observe that except for shanties, all housing situations present different levels of economic inefficiencies--below the 8% rate.

In the value diagrams, it may be observed that with the exception of shanties, property's actual values are 10% to 50% above what it would be feasible to obtain with the opportunity rate. When the same rate is applied to property revenues, the opportunity revenues obtained are consequently 90% to 50% above the actual revenues. In other words, if property's economic balance is desired, an increase in revenues should be obtained. The numbers below each diagram show the discrepancy between actual and opportunity figures.

Diagrams show a very clear pattern of the economic performance in low income housing situations. Apparently, properties with low values are more efficient and yield higher returns. As property value increases, it may be observed that return decreases.

Although Public housing presents economic imbalances, when compared to market returns, it should be remembered that social interest housing is financed with 6% interest rates. Theoretically at least, this should increase the disproportionately low returns by 2 points.

3.1 ECONOMIC VALUATION: RENTS, OPERATING EXPENSES

1 BUENOS AIRES

Popular Very Low Income Shanties

With limited income, the population can only afford the rent of land. Rented land area is in direct relation with population's meager ability to pay. Nevertheless population devote 25% of income and more for rents. Shanties lack of services. Population doesn't have operating expenses, since obtain free the services and facilities. Real estate taxes are payed by property owner (leaser). Tax charges are low.

2 JALALPA

Private Low Income Row Houses

Population devote up to 25% of income for lot amortization or housing rents. Values are low, but are increasing due to intense demand. Low values result from unserviced lots. Services are obtained at higher prices than Official tariffs. Besides rents, households must still spend 8% of income in services -mainly water and electricity. No taxes have been levied on recently developed subdivisions.

3 L. SAN AGUSTIN

Private/Popular Low Income Row Houses

The colonias property values have increased since their development a decade ago. Yet the lack of services/facilities maintain land values low. Households have made economic progress, yet housing rents still absorb up to 25% of their income. Services are expensive since they are scarce and sold at retail prices. Properties have no real estate tax.

4 NETZAHUALCOYOTL

Private Low Income Row Houses

This colonia lacks of adequate service infrastructure, although it was developed last decade. Land values are low, but intense demand stimulates increases. Lack of services tend to keep values low. Dwellings are continuously expanding. Land amortizations absorb up to 25% of household's income. The basic housing operating expenses are water and electricity. No taxes had been levied up to 1974.

5 PRO-HOGAR

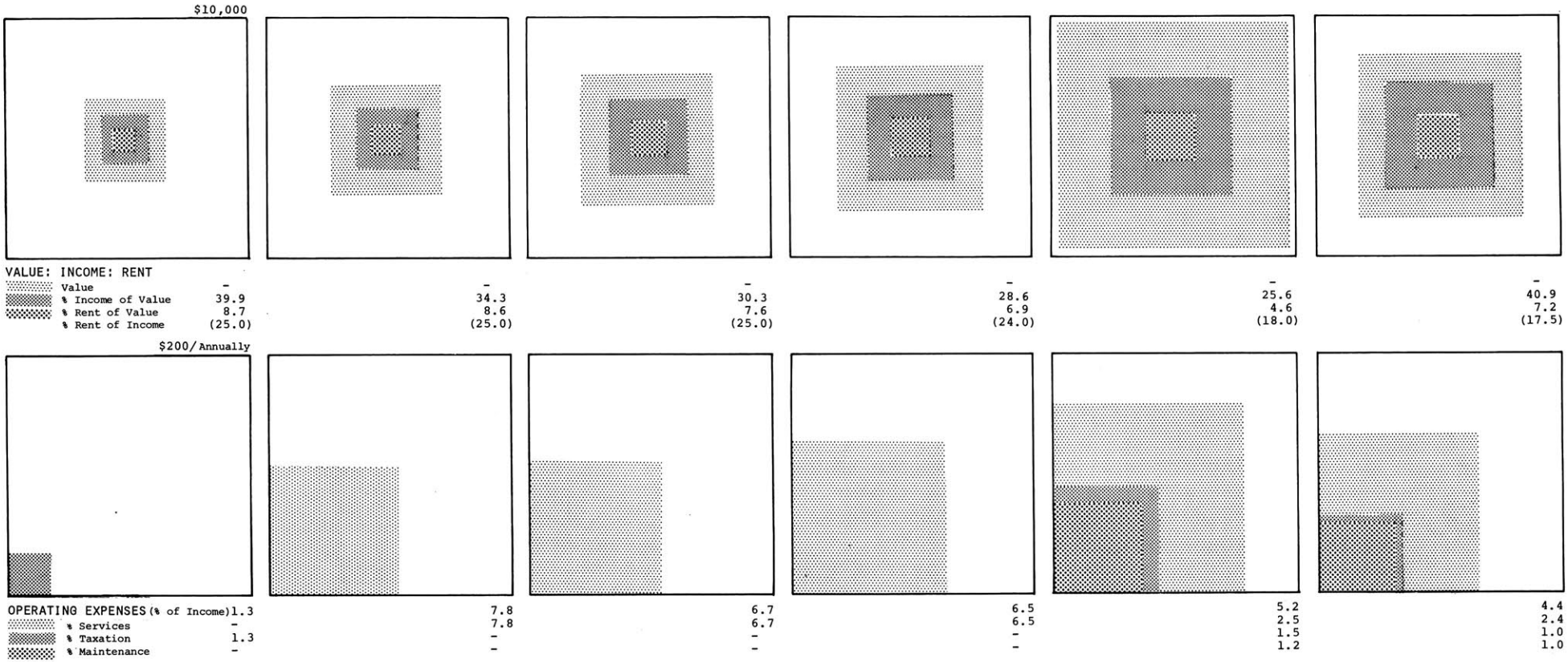
Private Moderate Low Income Row Houses

Dwellings have reached completition. Subdivision has been provided with service infrastructure, which has increased teh value of property. Although household's income has increased, the expenditures on property amortizations has remained proportionately low. The service tariffs (water and electricity) are low, but since dwellings are well equipped with installations, service consumption increases considerably. Maintenance appears when households have to keep their installations in good conditions. Properties are levied with taxes.

6 VALLEJO

Private Moderate Low Income Walk-ups

Contrary to row houses that are constructed gradually, apartments are built instantly. Although construction values are higher than one story houses, apartment's limited area lowers the dwelling's value and makes them accessible to moderate low income purchasers. Apartments are provided with services. Operating expenses are low, since apartments are small and don't require much maintenance. Taxes are very low.



7 LAS VIZCAINAS

Private Moderate Low Income Row Rooms

The value of dwelling/rooms which form part of colonial building, could not be determined in appraisal, since law regards them as historic monuments. Households have a stable economic position, since rents absorb only 8% of their incomes. The limited size of apartments centers the operating expenses around its services. No taxation is considered; maintenance charges are minimal.

8 TEPITO

Private Low Income Apartments

Tenements are the only example in low income housing where households' annual income exceeds their dwelling value. This is partly because dwellings are small and densely populated. Although land values are high, apartments' small sizes limit their attributed value. Housing rents are very low, below 10% of household's income. Housing operating expenses are minimal, since apartments have few installations. Maintenance and taxation are also minimum.

9 TEPITO

Private Low Income Apartments

Household's income exceed the dwelling unit's attributed value. Rents are below 10% of household's income. Limitation in size gives low attributed values per apartment. Land is expensive, but dwelling's constructive component is deteriorated, which keep property values at medium level. 2/3 of operating expenses are absorbed by services, while the remaining goes for maintenance and taxation. Reduced apartment sizes keeps operating expenses less than 5% of household's income.

10 SAN JUAN DE ARAGON

Public M.Low/Middle Income Row Houses

Conventional subdivisions with instantly built houses, include service infrastructure and community facilities. Dwelling values are high. Households have permanent employment,i.e. stable economic position. Since project is subsidized, the amortizations on housing are very low, below 15% of household's income. Dwellings have adequate service installations, therefore their operating expenses are very high. Maintenance is also high, since households are obliged to keep the installations in good conditions. Public housing is temporarily tax exempt.

11 IZTACALCO

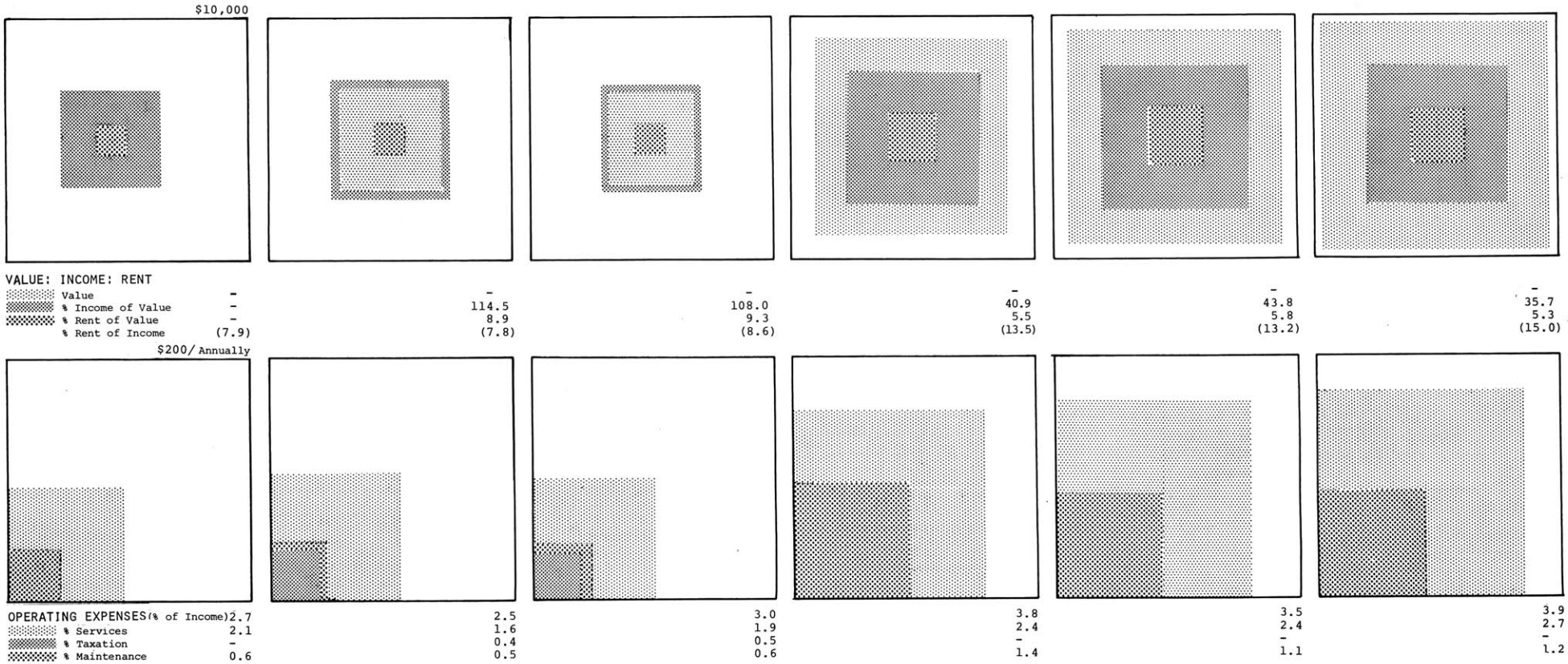
Public M.Low/Middle Income Walk-ups

Public housing is expensive when compared to previous cases on low income housing. This housing project is meant for unionized workers with stable economic position. Since housing is subsidized, amortizations are actually below 15% of household's income. Apartments are provided with services and community facilities. Most operating expenses are absorbed by services. Maintenance charges are high but are compensated with project's tax exemption. Operating expenses are below 5% of household's income.

12 NONOALCO-TLALTELOLCO

Public M.Low/Middle Income High Rise

Apartments are expensive because of the especial equipment involved in high-rise buildings. Households are economically solvent. Income represents one third of apartment's value. Due to subsidies, rents are 15% of household's income, which is low considering project's location and construction quality. Apartments are provided with all services. Housing operating expenses are below 5% of household's income. The majority of expenditures are absorbed by dwelling's services. Maintenance charges are high since they cover both the apartment and the environment up grading. Public housing is temporarily tax exempt.



3.2 ECONOMIC VALUATION: RETURNS, VALUES, REVENUES

1 BUENOS AIRES

Popular Very Low Income Shanties

The only housing situation where property's actual return is higher than opportunity returns. This is because returns are obtained from unserviced/ raw property.

2 JALALPA

Private Low Income Row Houses

Unexpensive constructions yield low returns that initially are proportional to property's value. Values tend to increase faster than returns.

3 L. SAN AGUSTIN

Private/Popular Low Income Row Houses

As property values increase, revenues tend to remain constant, stimulating economic unbalances. The rate of return tend to decrease.

4 NETZAHUALCOYOTL

Private Low Income Row Houses

Limited revenues for such property value yield a low rate of return. Low densities yield inefficient use of property.

5 PRO-HOGAR

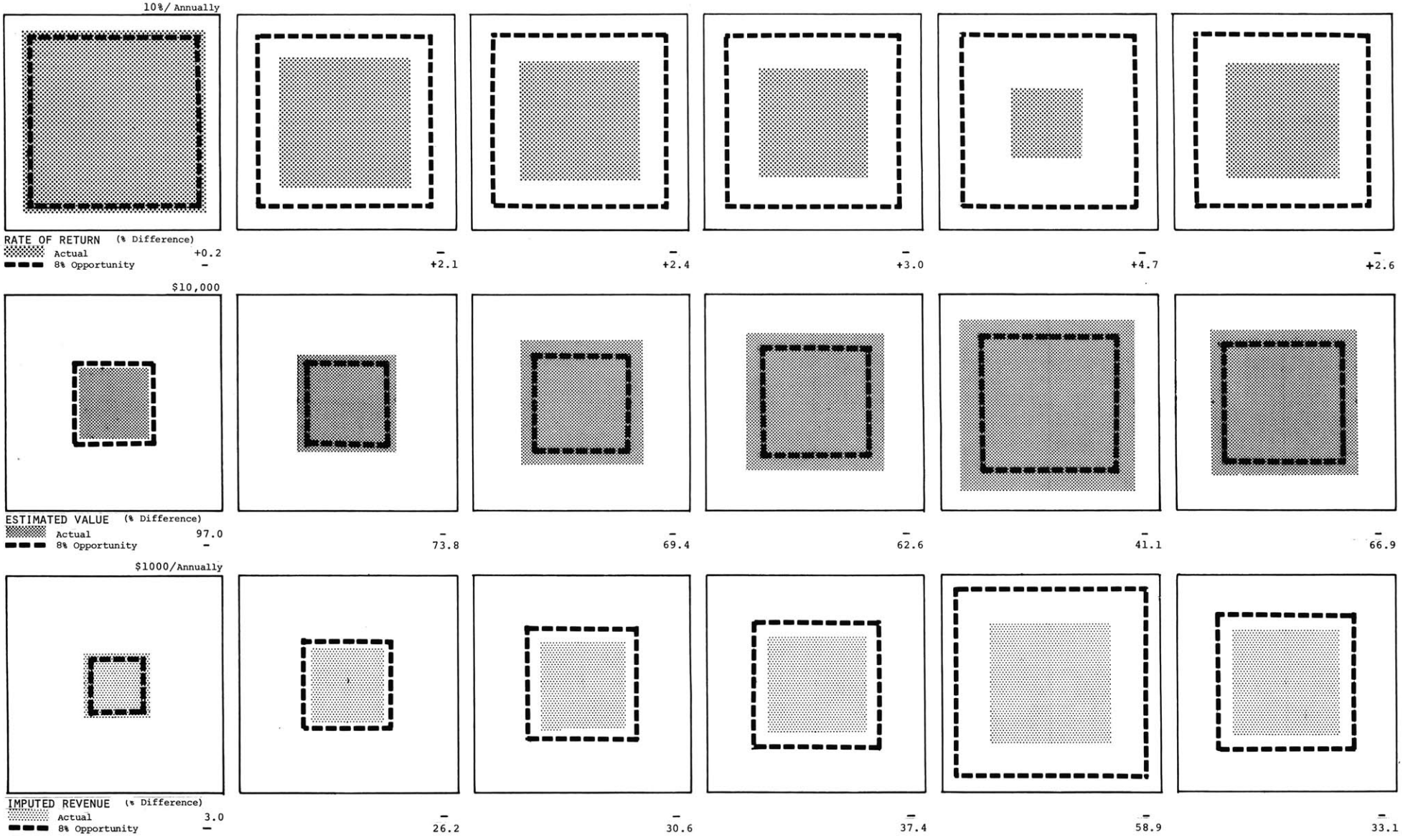
Private Moderately Low Row Houses

Expensive properties with constant revenues yield very low returns. To reach an economic balance, properties could increase their revenues by 40%.

6 VALLEJO

Private Moderately Low Walk-up Apts.

High property value(services and construction) is not compensated by property returns. Properties could densify their use. They are indirectly subsidized.



8 TEPITO

Private Low Income Apartments

Property are stagnant. They yield high revenues, since operating expenditures are minimal.

9 TEPITO

Private Low Income Apartments

Properties yield revenues that are almost competitive with the mortgage market.

10 SAN JUAN DE ARAGON

Public M.Low/Middle Income Row Houses

Low densities with high property values yield low returns. Properties could intensify their use and increase their revenues. Low return is partly due to direct subsidies.

11 IZTACALCO

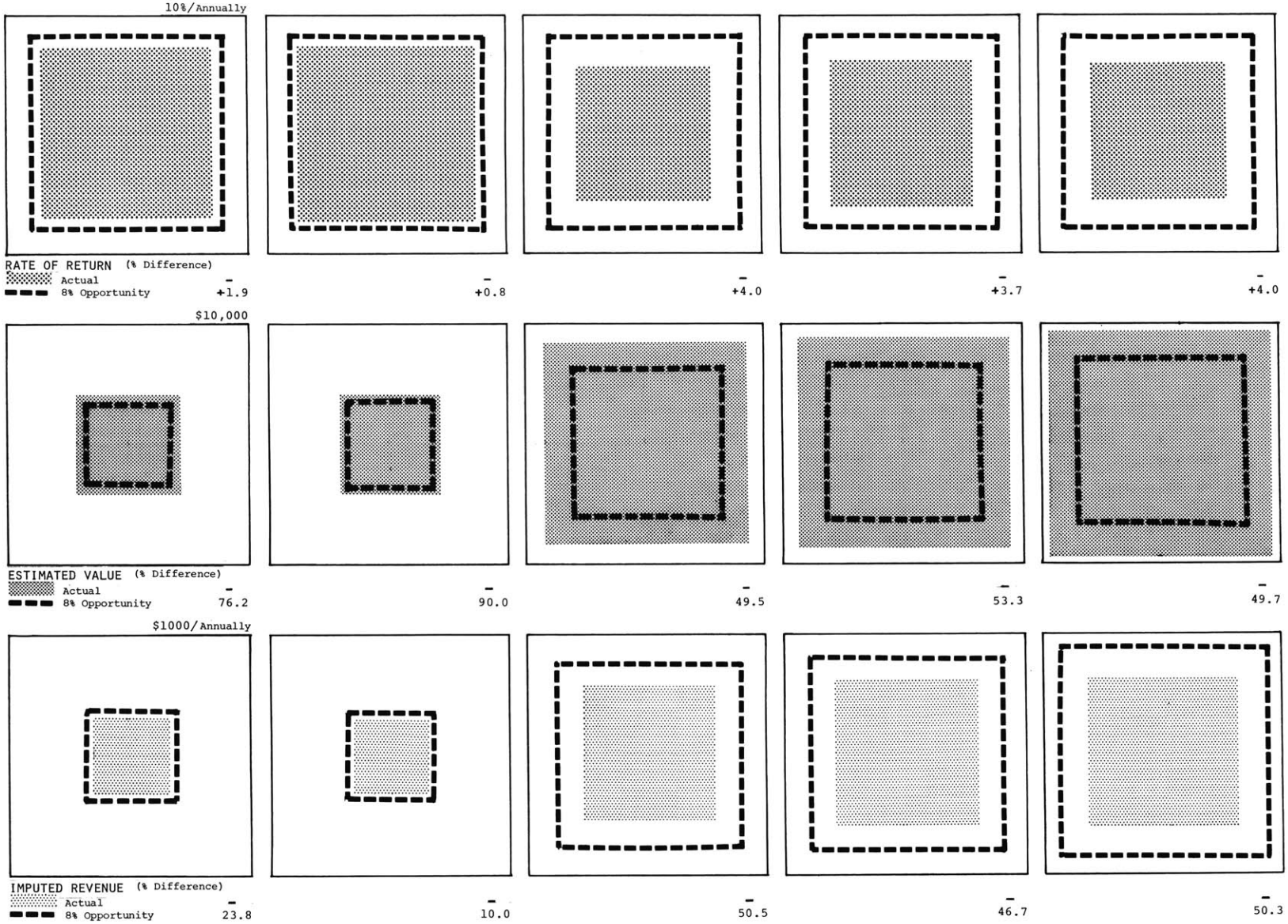
Public M.Low/Middle Income Walk-ups

In spite large open areas, apartments have medium density. Capital intensive construction which with direct subsidies yield low returns.

12 NONOALCO-TLALTELOLCO

Public M.Low Middle Income High Rise

High density, very capital intensive project which due to direct subsidies yield low returns. Notice that dispite the difference in dwelling value, the Public housing cases yield low returns.



V. CONCLUSIONS

1. PHYSICAL/ECONOMIC CHARACTERISTICS

The first part of this study dealt with the definition and analysis of the physical and economic characteristics of low income dwelling environments. The second part dealt with the economic valuation of typical housing situations, testing them against the financial and real estate components of the urban economy. This third part describes the relevant issues in the analysis and valuation coupled with conclusions on existing low income housing.

1.1 PHYSICAL:

Through the analysis we have learned that low income dwelling environments present different aspects of "sub-standard" physical conditions.

The area of some low income housing situations is very limited (ciudades perdidas, vecindades); but also most dwellings that are still at early construction stages present limitations in area as well (new colonias). Twelve square meters is considered the minimum area per person in Public subsidized housing (SHCP 1964:119), which actually is twice and three times more than those housing situations. (see 3.2)

Services are also the most common defficiency in Metropolitan dwellings, where water and sewerage are hardly available, particularly in peripheral colonias proletarias. (see 3.1) Dwellings in vecindades and in ciudades perdidas also have limited services, although the lot has adequate service supply. (see 3.1)

The physical state of dwellings, which depends on their material condition and maintenance, is generally ruinous (in tenements) or in precarious condition (shantytowns, new colonias). Only a minority of dwellings have a fair physical condition (old colonias, Public housing). (see 3.2)

The land utilization of housing systems which operated on a rental basis (vecindades, ciudades perdidas) is normally adequate, since the circulation and common areas are kept to a minimum. In subdivisions (colonias), land utilization is inefficient because a large proportion of area is utilized for circulation purposes. (see 3.1)

Not only does Public housing have adequate dwelling areas, but good construction quality and efficient service supply as well. Only land utilization was identified as inefficient because of generous recreational areas and parking facilities (see 3.1, 3.2).

If the majority of Metropolitan dwellings were identified as 'sub-standard', this was because they have been approached and comparatively analyzed from the ideal situation of a 'standard' dwelling, i.e. 'social interest' Public housing.

It seems that the evaluation of dwellings and environments on the basis of 'standards' can be misleading when applied to a developing context where 'standard housing' is not the rule but rather, the exception.

Low income groups have few housing alternatives, all of which can be considered 'sub-standard'. If the low income population has no possibility whatsoever of competing for 'standard' housing, then it can be hypothesized that what they normally obtain in the housing market is 'adequate' to their economic means. The physical service characteristics of low income environments can be in fact 'standard' to a popula-

tion's socio-economic condition.

1.2 SOCIO-ECONOMIC ASPECTS:

The Official Minimum Wage of Metropolitan Mexico was approximately $800 a year in 1970-1971; which was usually earned by workers of employees in a semi-skilled capacity (Germidis 1974:68).

Of the total Metropolitan population in 1970, only 30.5% were economically active (Bataillon 1973:31). Of these, half earned less than the stipulated Minimum Wage. In contrast, only 2% of the labor force earned high incomes of $9601 p.a. and above (SIC 1971:197).

Not only is there an income-distribution imbalance, but more importantly this imbalance is strongly aggravated by demographic growth. The low income sector has increased at an average annual rate of 12% during the last decade while higher income groups, proportionally, experienced no increase (SIC 1960, 1970). This suggests that demographic growth will increasingly accentuate and widen the socio-economic differences between income levels within the Metropolitan population.

Regarding the economy, it is observed that the Metropolitan labor force expanded at 3.5% during the last decade absorbing an average of 65,000 persons annually (SIC 1960, 1970). With high demographic increase rates, demand was estimated at least 90,000 employments per year, or 30.5% of the annual population growth. The difference suggests that approximately one third of the labor force accumulates annually in the Metropolitan unemployment pool.

The surplus labor force gravitates around employment sources waiting for the opportunity of being incorporated. Until incorporation takes place, the increasing surplus groups rely upon informal employment and depend on the urban services/facilities for their subsistence.

It is obvious that the essence of the development dilemma lies in the explosive demographic growth. Under these circumstances of population growth and scarcity of economic opportunities, the dwelling environments will continue to be the low income population's housing alternatives.

1.3 ECONOMIC EVALUATION:

The analysis of dwelling environments revealed that low values were a consequence of their poor physical quality.

Land, however, is the principal determinant of a dwelling's value. Land values relate to the proximity of the city center (location) and the adequacy of urban services. It was found that land generally accounts for more than 60% of each dwelling's value in colonias and Public row housing; and more than 90% in vecindades and ciudades perdidas. On the contrary, in Public housing apartment buildings, construction values account for upward of 60% of the dwelling's total value. (see 3.3)

The dwelling environments correlate to the population's income level. Although the purchasing power (i.e. in housing payments) of low income groups is limited, the population manages to pay (in monetary and non-monetary terms) for a housing alternative which is within its economic means.

Dwelling values vary according to the housing system. The value of dwellings represents 3 to 4 times the household's annual income in colonias proletarias and are practically equal in vecindades. In ownership cases (colonias) the population benefits from the property's continuous value added, while rental situations (vecindades, ciudades perdidas), the population benefits from housing rents which are fairly constant due to the property's stabilized values.

The better off population living in Public housing obtain benefits in terms of subsidies and credit facilities, which lower income groups do not obtain. The value/annual income ratio is 1:2 to 1:3 which is within similar range to the Public housing of developed countries. (OSTI 1969:65)

The low income population benefits substantially from property value added, especially when housing expenditures (rents or amortizations) remain proportional to their income and not to property's value.

Traditionally, properties have increased in value at a higher rate than household income. It is only recently (in the last five years) that, due to inflation, official wages have increased in relative terms by 100% (see 3.3), while, in comparison, properties in old colonias increased 40%. (HB 1974) Since the majority of the population earns below the minimum salary, they have not benefited from income increases, and they have been most affected by the increasing housing and living costs. Since incomes haven't increased to meet inflationary costs, it can be assumed that their housing expenditures are being kept to a minimum least.

To summarize, on the one hand, properties are benefiting by increasing value; while on the other, the low income population is spending the minimum on housing. It has been observed that these characteristics accentuate as inflation intensifies.

The low income dwelling environment analysis and economic valuation was developed considering property values, net revenues and the relation of the two. The valuation approaches used -rate of return, estimated value, imputed revenue- helped identify and measure the economic performance of selected housing situations (see 4.1, 4.2).

When property values and net revenues were contrasted with opportunity returns (in mortgage market) and the real estate own capitalization rate, it was found that low income dwelling environments are economically inefficient. This simply means that properties yield low revenues in regard to their value. Furthermore, the information suggests that the increase in property values stimulates economic imbalances. (see 4.2)

The economic valuation indicates that the most depressed dwelling environments, ciudades perdidas and vecindades, function economically better than any other housing system. The reason is obvious: properties have a minimum investment on dwellings and are run with minimum operating expenses, thus nearly the entire rent is left as revenue.

In property ownership cases, however, households are willing to invest their 'available' resources on housing, stimulating 'mixed' effects in the dwelling environment: a) the new colonias properties show a rapid value increase since raw land is being transformed into urban uses; and b) while the inadequacy of services tends to slow properties increase in value.

At early settlement stages, a household's 'available' resources are absorbed by high operating expenses thereby leaving residual amounts for dwelling's construction. Even with the slow construction process, the property's increase in value is higher than its increase in returns (due to operating expenses) which generates economic imbalances (see 4.2).

At later stages, dwellings have finally reached completion and properties are provided with services. Thus households no longer have to invest their 'available' resources on housing. Typically, dwelling/land values have reached very high levels, yet housing expenditures are kept low. Properties at this stage will disproportionately value more of what they yield as revenues, thus also generating economic imbalances (i.e. old colonias) (see 4.2)

In spite of low returns, it should be pointed out that there are differences among the levels of economic efficiency of Public housing projects. Our information suggests that medium density walk-up apartments (IZTACALCO) have a higher return and lower value/income ratio than low density S.J. ARAGON or capital-intensive NONOALCO-TLALTELOLCO. (see 4.2)

Typically, when dealing with low income housing there is a tendency to approach, analyze and attempt solutions that aim to "improve" dwellings and their environments.

Public efforts are concentrated on the improvement of particular aspects of the dwelling environment. Most deal with water or any other service supply. Others deal with the dwellings' material conditions or their installations, their legality or extra-legality, reallocation, and so on. Ideally, all of them are concerned with raising the quality of dwelling/environments to 'standard' levels.

But in low income housing, practically anything can be done - and would be welcomed - to improve the populations' living 'standards'.

When improvements are made, they are accompanied by increases in property values. If a majority of 'benefited' households are not incorporated to the economic structure (as appears to be happening), it seems likely that they will not be prepared to repay the investment on improvements and/or increase their housing operating expenses when they have the improvements servicing their properties (see 4.1).

Not only might the local Government subsidize the population, but they might unnecessarily increase the imbalance between property values and population's income level (in terms of housing expenditures); thus stimulating inefficiencies in the urban economy. Ironically, it appears that the more improvements are realized, the more economic imbalances are accentuated.

The low income housing systems are well defined urban situations. Although they are 'inadequate' in their physical, land-utilization, and economic qualities, they do respond to a social function in providing the population with urban environments.

Perhaps, the housing systems can be best viewed from their social standpoint, as they have a 'social-benefit' content.

By contemplating urban society in the perspective of its economic development, it may be realized that the 'precarious' condition of society (and dwelling environments), obeys the 'precarious' economic development of the country and consequently of Metropolitan Mexico.

If a society is in a 'precarious' socio-economic development stage, actions aimed at 'improving' the quality of dwelling environments may not have the desired 'social-benefit' impact, simply because the urban environments are not the essential part of development, but rather, the society is.

Urban development is, after all, a long and gradual process which reflects the population's socio-economic development.

There are however, some 'improvements' that are indispensable for urban society's development, which for their 'social-benefit' content cannot be properly evaluated in economic terms. These refer mainly to the supply of basic hygienic and sanitary measures to ensure healthy dwelling environments.

The following section explores the concept of an urban policy suitable for a developing context.

2. PERSPECTIVES FOR AN URBAN DEVELOPMENT POLICY

Housing is usually defined in quantitative terms as a program or as the number of dwellings required to meet an estimated deficit. It is also commonly used as a yardstick to measure the country's economic growth in terms of housing production; to measure the urban capacity to adequately accomodate its population; to measure the efficiency of financial mechanisms; to measure the resources in construction material production, service infrastructure and so forth. It is used as well to identify and measure the population's living "standards" through their dwelling conditions and services.

Housing however, is rarely approached and defined in qualitative terms, as is attempted in this study.

In spite of the fact that demographic and urban growth in Metropolitan Mexico can be impressively expressed quantitatively, the low income population and its housing is qualitative in nature.

The qualitative nature of housing has its roots in the country's socio-economic development.

In urban terms, the country's development has been defined in terms of simple housing systems. The physical environment thus acts as a reflection of the population's social and economic characteristics.

Each housing system is representative of a population group. Each housing system plays an essential role in the development of urban society. And so, each housing system is an important component of the urban structure.

As analyzed in this study, the low income population always provides itself with housing, in measure of their economic possibilities. The low income population's principal concern regarding their socio-economic condition is expressed simply through their work or need of employment. At low income levels, housing is a secondary priority. (Cornelius 1974: 211) Initially the population strives to settle and exist. Gradually, however, the population tries to incorporate itself into the urban economic system by means of employment. In its long struggle for subsistence, the low income population's efforts are concentrated in building up economic stability. Although housing for the low income population is always a need, it is not necessarily a priority.

2.1 NATURE OF POLICY:

What the Metropolitan Area needs is a policy tailored to the population's priorities, which can be formulated in order to support its socio-economic condition and stimulate its development. An urban development policy can be a powerful mechanism for incorporating the low income population into the urban economic system. This is accomplished initially by achieving control over Metropolitan land use and growth. This could undoubtedly be an important instrument in the redistribution of the population's income.

The first step is to recognize and accept the housing system structure as a result of City's socio-economic development. This implies that low income housing systems have to be left as they are, no matter how "bad" and even "dangerous" they may seem to be. They do respond to a reality and represent a stage in the population's socio-economic development. And as development stages, they should be preserved to assure continuity of the process. The policy's principle could be that of preserving and stimulating through urban environments the development of commu-

nities into urban societies.

This policy would have to deal with the urban context as a whole, including all housing systems simultaneously. Only in this way may it be feasible to reinforce the urban structure, balance its growth and achieve efficiency in its use to the population's benefit. It is doubtful that a policy dealing with one housing system will have an overall impact on the urban structure. Isolated policies only have effects where they are applied, and they are likely to be 'remedy' actions.

Growth trends indicate that the low income groups will still be responsible for the Metropolitan Area's massive expansion. The accelerated urbanization process leans and depends heavily upon the existing urban structure: on its economy and service infrastructure. The question is, how heavy a load can this structure support before a serious social imbalance occurs?

It is evident that the urban structure has a finite capacity to 'absorb' surplus population groups. Already social pressure is intense. Low income groups are demanding their incorporation into the urban structure (Cornelius 1974). So far, the Government has managed thorough remedy action to deal, but not always satisfy, the population's demands. And trends show that population demands are increasing....

It should be realized that is has become necessary to anticipate future demands before an irreversible change or expansion in the urban structure occurs. It is mandatory that actions designed to 'set' control mechanisms on the urban structure be coordinated. A development policy could have the necessary instruments to adjust itself to population priorities and favor their integration but not to its endless physical expansion. It can be a powerful tool for achieving long term social balance.

2.2. LEGAL, FISCAL ASPECTS:

The urban development policy will have to be implemented through a legal structure. Such structure would assure that the policy's elements and components would relate and work efficiently among each other.

Land is the key element of this policy. Land could basically be legislated according to its use. And the property fiscal system could be restructured according to Metropolitan land use.

The legal instrument could be oriented to "regulate" the Metropolitan Area's land utilization, by making it more efficient in terms of its area distribution, its services and its growth. It could be most effective in regulating the overall Metropolitan land development and in temporarily promoting or blocking certain areas which are not desirable for development. For example, it could be possible to penalize land properties that remain vacant for obvious speculative intentions, or freeze properties to assure their vacancy. Adequate property taxation reforms will press owners to use land efficiently, all of which will stimulate a healthier urban economy.

Fiscal instruments could be supported by reforms on property transfer taxes. For example, when increasing the tax base -according to time and to property value- the owners will be encouraged to withhold their properties for longer periods, thus avoiding short-term speculative turnovers.

It is desirable to support rental accomodations with adequate regulations, in order to protect low income groups from rent abuse, and to secure the terms of their accomodation. Yet, it is not desirable to stimulate long-term residence in rental accomodations. Regulations should permit a gradual and continuous renovation of housing stock, rather than typically fixing rents according to time periods or housing characteristics.

The Metropolitan Area's land resources should be preserved. It is necessary to regulate urban land use in the periphery of the ejidos, primarily, to protect them from gradual 'urbanization' or from their expropiation by housing agencies. The ejidos constitute a formidable land reserve bank that could be used effectively to control short-term expansion and provide land for long-term developmental needs.

2.3 FINANCING ASPECTS:

If legal and fiscal instruments could provide the structure for urban development, the financial mechanisms could provide the means by which the population could fulfill their own priorities.

Actually, urban development is mostly promoted by the private sector through commercial banks. The public sector carries its self-established programs regardless of the popular and private sectors' developmental interests. There is absolutely no formal relation between these three sectors in regard to urban development.

Since the financing resources for urban development are limited, some reforms on financial mechanisms are needed in order to strengthen the actual capital market and divert funds for mortgage credit.

Reform could deal with the assets of public agencies (housing, banking, financing), commercial banks (mortgage, finance), and non-banking institutions (life insurance and casualty companies, savings and loans, pension funds,...). It could be feasible to derive a certain percentage of their capital funds for mortgage investment. The mortgage capital market could be substantially increased through a coordinated finance policy based on local institutions. The financing of urban development could deal with housing as much as with service infrastructure, social welfare, direct subsidies, and so forth.

It would be necessary for the Government to sponsor these institutions through a secondary mortgage market and by guaranteeing selected types of mortgages (as FOGA). This would facilitate housing financing by enhancing the liquidity of the mortgage market (as FOVI). Both mechanisms are already institutionalized and in operation. Actions should be directed to support the role played by these institutions both in the capital market and as promoters of urban development.

It is obvious that the low income population -especially at early socio-economic development stages- would not benefit directly from capital market reforms and mortgage credits. But the spill-over generated by massive construction -stimulated by this policy- will benefit them, since they provide the building industry's labor force.

Public investment in the service infrastructure and on housing could then emphasize primary aspects of the development policy, and not constitute "the" policy itself. In other words, the policy could be oriented to consolidate a more powerful capital market for development through private investment incentives with a Government guarantee. The Government here could seek partnership with private enterprise for the population's benefit.

At the same time as investing in housing, the Government will have to develop a tax policy aimed at large profits, particularly in the construction industry, where is is estimated that, on the average, the margin of profit on building low cost dwelling units amounts to 40%. (Germidis 1972:52)

2.4 HOUSING AGENCIES ROLE:

The housing agency's role has been mainly oriented towards housing package supply. These agencies are concerned with quantitative aspects of the popula-

tion's housing needs. Housing programs are generally based on demographic growth estimated or on housing deficits.

More than 50% of Metropolitan population lives in 'sub-standard' conditions of space and services. The information analyzed revealed that low income housing systems increase at higher rates than higher income housing, including Public housing. For this reason, in the decades to come, 'sub-standard' living conditions will become more aggravated.

The high demographic increase rate of Mexico City has rendered the situation of housing dramatic. In response to demand, urban expansion has been intense and totally uncontrolled. Yet the urban development scale transcends dwelling to household relation. Urban development is at a regional level, including the Metropolitan Area. (OPR 1973)

If the intense Metropolitan development is interpreted as the population's demand for individual dwellings, then supposedly the Public agencies' simplified task could be that of matching housing 'production' to meet the population's demand.

The construction material industry did not have the capacity to expand and increase its production to meet the population's and housing agencies' increasing needs (Bazant 1972:42). Like everything else, the construction industry has substantially increased its prices during the last decade.

With such inflationary trends, 'housing' as a product is costing more every day. Yet, the low income population remains comparatively static, with an increasing economic disadvantage insofar as incorporating in Public or commercial housing markets.

So, if approached quantitatively, the problem of meeting the housing deficit and demand as such will remain without an effective solution.

The existence of a large number of institutions with overlapping, parallel or 'complementary' responsibilities, that deal directly or indirectly with low cost housing problems leads to confusion. (Germidis 1972:44) Since agencies lack inter-relation it seems indispensable that their "programs" should be defined in the basis of the development policy.

2.5 HOUSING SYSTEMS:

An overview of the development policy gives an orientation regarding the level of political decisions and technical assistance required for its formulation and implementation. It offers a reference-frame for defining how the different housing systems stand within a policy that intends to improve their environment. The following comments suggest what could be the basic issue in each housing system.

CIUDADES PERDIDAS:

The ciudades play a vital role in providing accomodation to very low income groups. The population moves to ciudades because of their location near employment sources or activity centers. Dwellers originally intend to settle temporarily while permanent jobs are found or economic positions are improved which would permit them to move elsewhere. In reality what happens is that a majority of this income group never goes beyond the 'subsistence level' and is therefore compelled to remain in shantytowns.

The ciudades perdidas should be preserved as settlements, since they do provide a housing alternative for this income group. They represent the most precarious stage of the society's economic development, and it is extremely important to protect such environments.

Some basic hygienic and sanitary improvements are

required to assure a minimum of public health in these environments.

The policy could be oriented towards rent supervisions in order to enforce security and prevent abuses. This control could not necessarily be formalized in contracts, but somehow it is desirable to 'legalize' the owner-leaser verbal agreement.

When subsistence groups do not find accomodation in downtown ciudades, they settle in vacant lots in the intermediate ring and sometimes in the periphery. Since proximity to activity centers is essential for their existence, the policy could consider the localization of potential ciudades and perhaps some of these groups' reallocation. If concentrated near activity centers, subsistence groups would undoubtedly stand in a better position to subsist and gradually incorporate into the economic structure.

If ciudades perdidas are provided and regulated adequately, they could offer very good alternatives to the periphery's squatter settlements or property invaders.

COLONIAS PROLETARIAS NUEVAS:
Through research, colonias showed that they are planned subdivisions in precarious conditions, with a lack of services, defficiency in land utilization and low densities. They do have, however, a very high annual increase rate.

The most relevent factor concerning the Metropolitan development is precisely the rate at which they are expanding. If growth trends in the present decade should follow similar intensity as in the past decade, the Metropolitan Area will probably continue to expand disproportionately.

It is vitally important that development policy aims to "regulate" the uncontrolled development.

Demographic increase could still be absorbed by actual colonias and Metropolitan Area. It could be supported by land use regulations and by fiscal mechanisms.

The service infrastructure should be provided only when the colonias reach medium densities. If services are provided when colonias still have low densities, the investment will probably not be recovered. Furthermore, it will only benefit minority groups and speculators. The political complications may be serious because while providing services, the Government may be pressed to supply other missing facilities. A mis-timed service supply could stimulate the expansion of colonias even more. The services should then be supplied seeking maximum benefit on population.

It seems desirable to stimulate the population to work for what they want. Some facilities for community organization could be provided to teach and encourage low income groups to satisfy their own priorities, not only through Government petitioning, but primarily through the previously established legal, fiscal and financial mechanisms.

COLONIAS PROLETARIAS VIEJAS:
Through research, its population showed a stable economic position and lower growth rate. Its households could afford a heavier fiscal burden, which could press them to intensify their property use. In other words, they could sell what they don't need or rent the extra space for shops or housing accomodations.

The old colonias land utilization is inefficient. A large percentage of its areas are for circulation purposes which currently are maintained by local Government. It is feasible to reduce the maintenance burden by making the colonias neighbors responsible for their own environments' maintenance.

Some streets could be closed to public circulation and could be made for semi-public or interior circulation. In this way residents could enjoy open areas as an extension of their houses. The cluster-type of arrangement could strengthen the community ties and could provide security to cluster residents.

VECINDADES:
Through analysis this housing system showed an efficient land utilization, which stimulates community life. Its limited apartment sizes provide inexpensive rental accomodations in ideally located areas near activity centers.

The majority of downtown tenements have frozen rents, which has blocked this zone from its development.

It is considered desirable to "open" and "revitalize" the central housing market for the low income population. The frozen rent law could be completely abolished and housing rents could be controlled through legislation or regulations. Its aim could be to protect lower income groups that need central accomodation and to press better off tenants to move out.

A property tax increase can be desirable on main commercial avenues or where renewal is considered necessary. This will increase property value and can encourage owners to seek better rentability through remodeling or renewal.

It is desirable to keep property taxes low in the downtown's interior blocks, those who aren't near main commercial avenues. It is not desirable that the owners shift their tax charges to tenants -who could not afford to pay them but who still need those particular locations.

Tenements require basic hygienic and sanitary improvements which could at least provide its residents with a healthy environment.

In short term, any urban renewal action on tenement areas could likely have a negative effect in the locality, since it could stimulate increases in property values and housing rents. In the long run, market forces could press for the renovation of downtown housing stock, if legal, fiscal and financial mechanisms are provided.

CONJUNTOS HABITACIONALES:
As analyzed, Public housing projects have inefficient land utilization, because of an excess of open and recreational areas, as in comparison to areas under the population's control. From simple subdivisions to complex high-rise projects, the population's participation in their own environment is limited almost entirely to their dwellings.

The excess of public areas is an unnecessary maintenance burden for local Government. The policy could contemplate the re-utilization of these areas.

Excess areas could be re-distributed for private, semi-private, or semi-public use. Also, large projects could be physically subdivided to form smaller housing groups. By sharing common responsibilities, the population could have better opportunities to identify with their environment and integrate into a community.

As explained, land in Public housing is generally obtained through expropiation, whose cost is not significant as compared with the capital investment required for both the service infrastructure and the housing construction.

What happens commonly is that agencies do not consider the real market value of land as part of their investments. The real land value is never added to a dwelling's construction costs, is never shifted forward, and never payed by purchasers. Dwelling values are low for what the purchaser obtaines in

return, because their values have been 'arbitrarily' fixed.

Research revealed that families living in Public housing spend a smaller percentage of income on housing than lower income households. This is because agencies estimate a dwelling's cost as a base of incomes; but these calculations do not consider the market value of land. The purchasers therefore, made a very good investment.

One consideration is that agencies subsidize housing through direct control of the construction process and its profits, through tax exemptions and special concessions in permits, regulations,...; and through credit availability which eases the economic burden on purchasers.

A second separate approach is that agencies -using expropriation- obtain land at below market values, and use its apparent low value as a housing subsidy, which in fact turns out to be more than a subsidy: it is a gift.

Land has a value. If neither agencies nor purchasers pay for it, the "urban structure" itself is paying for this value in terms of inefficiency in its economy; in land market, in service infrastructure and in location.

For the time being, the periphery should remain frozen from development in order to contain the Metropolitan expansion. Also, no renewal programs should be attempted in downtown areas to avoid unnecessary value increases.

The intermediate ring is the most desirable location for housing projects, since the zone is partially urbanized and projects could serve to consolidate and complement its services and facilities. But eventually all vacant land will be used. What is likely to

happen is that agencies will be obliged to bid in the market to obtain land for their projects. This will increase their housing costs and will push them unwillingly and unnecessarily to compete with middle income commercial housing.

If the development policy is supported adequately, it could gradually stimulate a change in the housing agency's role, -from constructors/promotors to fund supporters of the housing mortgage market.

It should be remembered that the present housing situation represents a particular stage of the city's socio-economic development. The policies could aim to support and stimulate the development of urban society.

There is an urgent need for leadership to structure the direction of urban and socio-economic development. It is the function of the Government to fulfill this role. The choices of development are, after all, political decisions.

GLOSSARY

Definitions of terms which are generally accepted and not essential to the presentation/understanding of the text are included in the 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 "The Real Estate Dictionary of Terms and definitions", Real Estate Publishing Co., Calif., 1973.

Third Preference: Definitions from authors, used when existing definitions did not satisfactorily make clear with what meaning, extend and limits, terms are used.

ACQUISITION: the process by which property is procured through purchase, inheritance, gift, foreclosure, so forth.

AMORTIZATION: the liquidation of a financial obligation on an installment basis, also recovery over a period of cost or value. (Ring 1972:609)

APPRAISAL: an estimate of quantity, quality, or value. The process through which conclusions of property value are obtained; also refers to the report setting forth the estimate and conclusion of value. (Ring 1972:609)

ASSESSED VALUATION: assessement of real estate by a unit of Government taxation purposes. (Ring 1972:610)

ASSESSEMENT: a charge against real estate made by a unit of Government to cover the proportionate cost of an improvement such as a street or a sewer; also the valuation of property for the purpose of levying a tax at the amount of the tax levied. (Ring 1972:610)

CADASTRE: an official register of the quantity, value and ownership of real estate used in apportioning taxes.

CAPITAL ASSETS: assets of a permanent nature used in the production of an income such as land, buildings, machinery and equipment.

CAPITAL GAIN: the gain received on the sale of real or personal property other than property sold as stock-in-trade.

CAPITALIZATION: in appraising, determining value of property by considering net income and percentage of reasonable return on the investment.

CAPITALIZATION RATE: the rate of interest which is considered a reasonable return on the investment and used in the process of determining value based upon net income.

COLLATERAL: this is the property subject to the security interest.

COMMUNITY: the people living in a particular place or region and usually linked by common interests; the region itself, any population cluster.

COMPARATIVE ANALYSIS: a method of appraisal in which selling prices of similar properties are used as the basis for arriving at the value estimate. Also known as market data approach. (Ring 1972:390)

CONDOMINIUMS: apartments or other type of property in which the owner has the title to the part actually occupied, with an undivided interest in areas used by all occupants.

COST: is always a measure of a past sacrifice of either labor or material or both, and always represents a measure of past expenditures. (Ring 1972:385)

COST APPROACH: an appraisal technique used to establish value by estimating the cost to reproduce the improvements, allowing for depreciation. (Ring 1972:388)

CONSTRUCTION: the activities involved in the actual erection of a house, also the physical component of a house.

DEFAULT: failure to perform a duty or keep a promise, such as to make payments on a note.

DEMAND FOR HOUSING: a request for the occupation or possession of housing by an individual or consumer preference excercised through dollar purchase. It is one choice from a range of values an individual can make in the market-place. (OSTI 1969) Also one of the four essential elements of value.

DETERIORATION: impairment of condition, one of the causes of depreciation and reflecting the loss in value brought about by wear and tear, desintegration, use in service and the action of the elements.

DEPRECIATION: loss in value in real property brought about by age, physical deterioration, or functional or economic obsolescence. Broadly, a loss in value for any cause.

DEVELOPMENT: gradual advance or growth through progressive changes; a developed tract of land.

DWELLING: the general, global designation of a building/shelter in which people live. A dwelling contains one or more dwelling-units.

DWELLING BUILDER: four groups are considered:

Self-Help built: when the dwelling unit is directly built by the user or occupant.

Artisan built: when 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: when 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: when the dwelling unit is totally built by a large organization hired by the developer; 'large' contractor is defined by the scale 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.

DWELLING CONSTRUCTION TYPES: primary dwelling construction types and materials are grouped in the following categories:

Shack	roof:	structure-rods, branches. infill-thatch, mats, flatened tin cans, plastic or canvas sheets.
	walls:	structure-rods, branches, poles. infill-thatch, mats, flattened tin cans, plastic or canvas sheets, cardboard, scrap wood, and/or mud.
	floor:	structure/infill-compacted earth.
Mud and Wattle	roof:	structure-wattle. infill-thatch, flatenned tin cans, or corrugated iron sheets.
	walls:	structure-wattle. infill-mud.
	floor:	structure/infill-compacted earth.
Wood	roof:	structure-wood rafters. infill-thatch, flatenned tin cans, or corrugated iron sheets.
	walls:	structure-wood frame. infill-rough hewn wood planks
	floor:	structure/infill-compacted earth, wood joists, flooring.
Masonry/ Wood	roof:	structure-wood rafters. infill-corrugated iron or asbesto sheets or terracotta tiles.
	walls:	structure/infill-murram,stone, brick,block or tile masonry without colomns.
	floor:	structure/infill-poured concrete slab on/off grade, wood joists, flooring.
Masonry/ Concrete	roof:	structure/infill-poured reinforced concrete with tar and gravel or terracotta tiles.
	Walls:	structure/infill-murram, stone,brick,block or tile masonry without columns or with columns for multi-story dwellings.
	floor:	structure/infill-poured concrete slab on/off grade.
Concrete	roof:	structure/infill-poured or precast reinforced concrete with tar and gravel, or terracotta tiles.
	walls:	structure-poured or precast walls or frame. infill-metal,wood,masonry, plastic.

floor: structure/infill-poured or precast concrete slab.

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).

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.

Private sector: the individuals, groups or societies who have 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 Private sector generally for profit.

Public sector: 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).

DWELLING DEVELOPMENT MODE: two modes are considered:

Incremental: 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 possession of land and an adequate building site.

Instant: the formal development procedure in which all structures and services are completed before occupation.

DWELLING FLOORS: the following number 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.

DWELLING GROUP: the context of the dwelling in its immediate surroundings.

DWELLING LOCATION: three sectors of the urban area are considered:

City center: the area located within a walking distance (5 km. radius) of the commercial center of a city; relatively high residential densities.

Intermediate or Inner ring: the area located between the urban periphery and the city center (5 km. to 10 km. radius) relatively lower residential densities.

Periphery: the area located between the rural areas and the urban inner ring (10 km. to 15 km. approx. radius); relatively low residential densities.

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.

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.

DWELLING UNIT: a self-contained unit in a dwelling for an individual, a family or a group.

DWELLING UNIT AREA: the dwelling unit area (m2) is the built-up, covered area of the dwelling unit.

DWELLING UNIT COST: the initial amount of money paid for the dwelling unit or the present monetary equivalent for replacing the dwelling unit.

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, 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 and 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).

DWELLING UTILIZATION: the utilization indicates the type of use with respect to the number of inhabitants/families:

Single: an individual or a family inhabiting a dwelling.

Multiple: a group of individuals or families inhabiting a dwelling.

EQUITY: the interest or value that an owner has in real estate over and above the mortgage against it; system of legal rules administered by courts of chaucery. When applied to low income groups it may refer also to:

Sweat equity: refers to the participant's physical labour in lieu of cash to acquire value in property.

Enterprise equity: refers to the participant's work in management functions in any phase of the housing process. (OSTI 1969)

ESTATE: the ownership interest of a person in real property.

ESTIMATE: to form a preliminary opinion of value.

EXPENSE: a cost or that portion of cost which under accepted accounting prodedures is chargeable against income of the current year.

FINANCING: the process of raising or providing funds. Three types are considered:
Self-financed: provided by own funds.
Private/Public financed: provided by loan.
Public subsidized: provided by grant or aid.

HOUSING: is used as a collective noun for a given stock of houses or residential properties. (Turner 1974:14)

HOUSING SYSTEM: identified urban dwelling environments with associated socio-economic characteristics, location in urban areas, specific forms of tenure,... (Turner 1971:73)

IMPROVEMENTS: things build on land which become part of it. Examples: buildings, services.

INCOME: a gain or recurrent benefit that is usually measured in money and for a given period of time, derives from capital, labor, or a combination of both. In this study a distinction is made between: income as applied to monetary benefits of labor (household's earnings), and revenues as applied to gains

from transactions in capital assets or the value of goods and services received by an individual (real estate owner). Two types are considered:

Gross revenue: all income derived from any source except for items specifically excluded by law and deductions of certain outlays (as costs of goods sold or expenses in connection with rental income)

Net revenue: remaining income from property after proper charges, costs and expenses are deducted; usually for a given period, and losses allocable to the period.

INCOME APPROACH: an analysis in which the estimated gross revenue from a subject residence is used as a basis for estimating value along with gross rent multipliers derived. (Ring 1972:391)

INCOME GROUPS: based upon the subsistance income per year, five income groups are distinguished:

Very low: (below subsistence level) less than $432/year.
This group has no income available for services or transportation.

Low: (1 to 3 subsistence level), $432 to $1296/year.
The upper-low income group can afford limited subsidized housing.

Moderately low: (4 to 8 subsistence level), $1296 to $3456/year.
This income group has access to Public/Private commercial housing (rental).

Middle: (8 to 22 subsistence level), $3456 to $9600/year.
This income group has access to Private commercial housing (ownership).

High: (above 22 subsistence level), $9600/year and above.
This income group represents the most economically mobile sector of the population.

INTEREST RATE: the percentage of a sum of money charged for its use.

LANDLORD: one who rents property to another.

LAND RENT: the price of the services yielded by land during a specific period of time.

LAND TENURE: the act, right, manner or term of holding land property. Types are categorized by how land is held and for what period of time. Legal definitions are established to determine the division of property among various owners, or the relationship between owner or occupier, or between creditor and owner; and between private owners and the public, and includes the assessement of taxes on private land, rights and the regulation of land use through government control. There are two basic forms of land tenure:

Land ownership: when the exclusive right of control and possession of a parcel of land is held in freehold.

Land tenancy: when the temporary holding of mode or holding a parcel of land is of another.

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: users.

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.

LAND UTILIZATION, RESPONSIBILITY: the quality/state of being morally/legally responsible for the use and maintenance of land by the owners/users.

LEASE: a contract, written or oral, for the possession of land and tenements on the one hand and a recompense of rent or other income on the other.

LEASEHOLD: an estate in realty held under a lease.

LOT: anyone of the marketable parcels into which a tract of land is divided upon platting applied especially to urban land.

MARGINAL LAND: land which barely pays the cost of working or using.

MARKET PRICE: the price paid regardless of pressures, motives or intelligence.

MARKET VALUE: the price at which a willing seller would sell and a willing buyer would buy, neither being under abnormal pressure.

METROPOLITAN AREA: "an area in which economic and social life is predominantly influenced by a central city, to which it is linked by common interests though not often by common policies. The metropolitan area may have one city or more as well as outlying districts or satellite communities. No physical or legal boundaries mark its borders, but roughly speaking, these are the outer limits of commuting to or from the central city". (Abrams 1971)

OPERATING EXPENSES: normal (stabilized) expenditures that are incurred in the property maintenace and its utilization. The expenses considered are:

Maintenence: regular expenses on property's physical keeping (cleaning, painting so on), its supplies, remplacements, and repairs.

Tax: a levy on property's value or rents or fix quota; by political subdivisions in order to support administration and services.

Services: regular charges incurred on property's operation, mainly: water and sewerage, electricity and gas, heating, insurance, payrolls and management.

Financing costs: refers to the interest cost charged for the use of money in loan or property's mortgage.

Others: rent recollection losses; vacancies.

OWNERSHIP: to have or possess a property; propriertorship. Lawful title to something.

PERCENT RENT/MORTGAGE: the fraction of income allocated for dwelling rental or dwelling mortgage payments; expressed as a percentage of total household's income.

PROPERTY: the right or interest that an individual has in land and chattels to the exclusion of all others. Bundle of rights.

PRIORITY: being first in rank, time or place.

PUBLIC TRANSPORTATION: that segment of urban transportation which is available to the public without restriction. As public transport, it may also be regulated as to its operation, charges and profits. (Abrams 1972)

REAL PROPERTY: land, that which is affixed to the land, that which is incidental or appurtenant to land and that which is immovable.

RENT: consideration paid for the use and possession of property.

RESTRICTION: an encumberance which limits the use of real estate in some way.

RETURN: the interest earned by an investor on his investment.

RIGHT OF WAY: an easement to pass over, or maintain services, on property or a part thereof.

SALES PRICE: the price that the buyer is willing to pay considereing alternatives; represents the present of discounted value of future rental values. (Alonso 1970:16)

SCALE OF ECONOMIES: proportionate change in all inputs that lead to a greater proportionate change in outputs. (Mills 1972:13)

SCARCITY: one of the four essential elements of value. It is a relative term and must be considered in relation to demand and supply and the alternate uses, present or prospective to which the good or service may be put. (Ring 1972:381)

SECONDARY FINANCING: a loan secured by a second mortgage or trust deed on real property

SECONDARY MORTGAGE MARKET: market place for the sale and purchase of existing trust deeds and mortgages.

SETTLEMENT: occupation by settlers to establish a residence or colony.

SPECIAL ASSESSMENT: a tax against real estate by a public authority to pay the cost of public improvements for the property such as sewers, street lights, so on.

SPECULATION: an act of speculating by dealing with a view to making a profit from conjentural fluctuations in the price rather than from earnings of the ordinary profit of trade.

SUBDIVISION: a tract of land divided into lots suitable for home building purposes.

SUBLETTING: a leasing by a tenant to another, who holds under the tenant. A lease given by a lessee.

SUBSISTENCE INCOME: minimum regular income required by a 6 member household to cover its basic needs of food, fuel and housing using at least 85% of income. Defined for Metropolitan Mexico at $432/year in 1970-71 ($720 p.a. in 1974). (Turner 1973)

TENANT: one who is given possession of real estate for a fixed period or at will.

TENURE: the right or title by which property is held. Two situations of tenure of the dwelling units and/or lot/land are considered:
Legal: having formal status derived from law.
Extra-legal: not regulated or sanctioned by law.

Four types are considered:
Rental: where the users pay a fee (daily, weekly, monthly) for the use of the dwelling unit and/or the land/lot.
Lease: where the users pay a fee for long-term use (generally one year) for a dwelling unit and/or the land/lot from the owner (an individual, a public agency, or a private organization). No cases of lease are shown in the dwelling typology.
Ownership: where the users hold in freehold the dwelling unit and/or the land/lot 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.

TITLE: evidence that owner is in lawful possession thereof; an instrument evidencing such ownership.

TRANSFERABILITY: one of the four essential elements of value. Legal concept that implies the possession and control of all the rights that constitute ownership of property. (Ring 1972:381)

TURNOVER: the number of times a given amount of inventory sells over a given period of time.

URBAN AREA: all developed land lying within the urban fringe (politically undefined development lying between the city and the country) including a central city and any of its satellite communities; it is not a political/governmental unit.

URBANIZATION: the quality of state of being or becoming urbanized; to cause or take on urban characteristics.

URBAN DEVELOPMENT: is the change in land use which occurs as the city grows. Usually the change is from less intensive to more intensive use of land. (Neutze 1973:13)

USUFRUCT: the right to profit from a parcel of land or control of a parcel of land without becoming the owner or formal lessee; legal possession by decree without charge.

UTILITY: use. One of the four essential elements of value. Is the power of a good to render a service or fill a need. (Ring 1972)

VALUATION: estimated worth or price. Estimation. The act of valuing by appraisal.

VALUE: the worth of a thing in money or goods at a certain time; or a measure of future rights to income or amenities which are anticipated as a result of ownership and utilization of property. (Ring 1972:385)

YIELD: interest earned by an investor on his investment (or bank on the money it has lent). Also called return.

EXPLANATORY NOTES

QUALITY OF INFORMATION:
The quality of information given in the drawings, charts, and descriptions have 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 in/to a locality.

MEASURE EQUIVALENTS:

Linear Measures:

1 centimeter		= 0.3937	inches
1 meter	= 100 centimeters	= 39.37	inches
		= 3.28	feet
1 kilometer	= 1000 meters	= 3280.83	feet
		= 0.6213	miles
1 inch		= 2.54	centim.
1 foot		= 0.3048	meters
1 mile		= 1.6093	kilom.

Square Measures:

1 square meter		= 1,550	sq.in.
		= 10.7639	sq.ft.
1 hectare	= 10,000 sq.m.	= 2.4711	acres
1 square foot		= 0.0929	sq.m.
1 acre		= 0.4087	hs.

DOLLAR EQUIVALENTS:
The research was carried originally in pesos, which were later translated to dollars. When fractioned, the monetary unit was rounded to the higher unit. Figures in dollars have not been rounded, except for decimals. Therefore, all income, cost, revenue and rent/amortization data have been expressed in terms of the U.S. equivalent: 1 US dollar = 12.50 Mexican pesos. (May 1975)

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