URBAN CASE STUDIES: GUADALAJARA, MEXICO
Low Income Dwelling Surveys and a Site and Services Proposal

BY

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Signature of Author........................................
Department of Architecture, May, 1978

Certified by........................................
Horacio Caminos, Professor of Architecture, Thesis Supervisor

Accepted by........................................
Julian Beinart Chairman, Department Committee for Graduate Students

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ABSTRACT

This study presents a comparison of different typical low-income housing systems in the city of Guadalajara, Mexico. It provides data to formulate, evaluate and implement housing policies especially in the physical planning aspects. At the end, a proposed outline for a site and services project is also presented.

HORACIO CAMINOS
PROFESSOR OF ARCHITECTURE
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GOAL: The main goal of this study is to identify, analyze, evaluate and compare the present physical structure of housing systems in Guadalajara City, in relation to social, economical and cultural conditions.

APPLICATION/AUDIENCE: It provides a framework to help make informed decisions and to clarify particular courses of action related to low-income housing policies. It is directed to those concerned with the problems of shaping the environment, especially in those areas of very rapid growth affecting the low-income sector of the population.

DATA: The data are derived from field surveys carried out by the author from 1974 to 1978, also from interviews and reports from public and private agencies. These data can be used as a practical reference through the comparison of housing policies with existing residential environments.

MODEL: The proposed project is intended to serve as an alternative physical model, focusing on basic physical issues of land subdivision, land utilization and land distribution. It incorporates in the design physical, socio-economical and cultural inputs of Guadalajara.
BACKGROUND

Guadalajara, after Mexico City, is the second largest city of the country. Although five times smaller than the capital, it disproportionally influences the large northwest part of the country, attracting numerous migrants from the impoverished adjoining rural areas. This migration pattern along with the natural population growth of the city, has given rise to a massive urbanization that is becoming more and more unmanageable.

As opposed to Mexico City or Monterrey (the third largest city in the country), Guadalajara is not an important industrial center, local industry supplies a minimum of the products sold in the region. However, it is a large and important commercial-trade center where marginal employment and unemployment tend to proliferate. These offer little opportunities for the development of stable forms of employment for the new low-income migrants, which consequent jeopardize the effort of the authorities to cope with the uncontrolled urbanization.

Moreover, the inherent problems of large underdeveloped cities are already acute: Transportation problems, traffic problems; pollution; shortage of urban facilities, scarcity and speculation with urban land, goods and products. In short, aggravation of the conditions of exploitation whose largest effect is upon the lowest income sectors of population which represent by far, the majority.

All these problems are particularly pronounced and critical when related to housing, because this activity consumes most of the available urban land, requires the costly provision of utility networks and services, and demands urban facilities to such extent that the rapid growth overburdens the scarce resources of the city.
Simultaneously, the conventional government approach to this crisis has been highly inadequate. Therefore new, practical and pragmatic insights must be assumed by the authorities, in order to recognize and encourage popular participation necessary to alleviate these problems.

In this study a classification of present housing systems is outlined, with the aim of investigating existing patterns and conditions of different settlements; to relate and compare basic issues about land utilization and efficiency of settlements patterns; and to recognize, define and evaluate the limitations/potentials and evolution of these systems in terms of their physical structure.

The following housing systems are identified:

1. SQUATTERS: Sparsely located in the periphery, they mostly house very-low income people with extremely marginal employment. They have been able to sustain the illegal land tenure and occupation situation due to: the low value of the land, the settling on unused rights-of-way, or the ignorance of the land owners about them. This system does not have an impact on the total spectrum of housing, because they only represent one percent of the total population; no signs of growth are apparent.

2. TENEMENTS ("VECINDADES"): Predominantly located in the city center and inner ring. The system is largely made of standard court tenements, with one-two room rental dwelling units with a shared laundry area, toilet/bathrooms. A new apartment type tenement - with two rooms, basic services and shared court - appeared in the early 60's on both the inner ring and the periphery. The "vecindades" are the core housing system in the city; it serves very-low and low income recent migrants as well as very-low and low-income tenants that are attached to the city center for employment and opportunities. It accounts for approximately 17% of the population.

3. ILLEGAL SUBDIVISIONS: Located in the periphery, invariably on government land ("ejidos"), where the land has been illegally sold, and where the subdivision follows the basic former agricultural parcel pattern. Since 1970 this system is becoming the most important popular response to housing for the low income; three reasons may explain this phenomenon: 1- availability of large quantities of "ejidos" (approximately 10 km around the city center); 2- the private sector that has been incapable to compete with this "underground" supply; 3- the failure of the government to integrate these "ejidos" into the urban structure in order to be properly developed.

Today it accounts for about 16% of the population, but it is rapidly increasing.

4. PRIVATE SPECULATIVE DEVELOPMENTS ("COLONIAS POPULARES"): Located in the inner ring and the periphery, mostly towards the eastern side of the city. From 1950 up to approximately 1970, the private sector was the most significant source of land for the low and moderate-low income. From 1970 on, this group has had less and less capacity to pay for this kind of development. Presently this system houses 35% of the total population, but its importance is declining. The old private speculative developments are today well consolidated communities.
5. PUBLIC HOUSING: Located in the inner ring and on the periphery. The first large scale projects were developed about 15 years ago. Although intended for lower income groups, these projects have never reached such levels. They house lower-middle to middle income groups. It is the only housing system that contemplates the provision of instantly developed "packages", including utilities/services, complete dwelling units, and community facilities. The last impulse given to these programs was the "INFONAVIT" plan that did not accomplish its original goals, not even in number of finished dwelling units. It accounts for only 6% of the population, but might increase in the future dependent on government action.

6. OLD TRADITIONAL DEVELOPMENTS: Located in the city center and inner ring. Two original predominant influences can be mentioned: the dwelling model was imported from Southern Spain, and the layout resulted from the regulations of the "Cedula Real" of Phillip the Second. This still accounts for 17% of the total population. Different socio-economic pressures are making this housing system obsolete. Today it houses middle to middle-high income people.

7. HIGH INCOME AREAS: Housing systems serving middle-high and high income groups were not considered in this study. They represent approximately 8% of the total population. For these groups housing needs are adequately solved by private, market means.

CONTENTS

The work has been divided into three main sections:

1. Introduction: Overall information is placed at the beginning to provide a general view of the whole. A basic typological classification is presented in a land utilization summary. Twenty-one dwelling surveys complement this introduction with the purpose of correlating/comparing the trends and patterns of the spectrum of low-income housing. They are evaluated on two levels: Physical data (dwellings, etc.), and community facilities/utilities/services data. A brief conclusion is included at the end.

2. Case studies: Four representative case studies are presented; they are analyzed at four levels: The locality, selected segment, selected block and typical dwelling unit. A brief urban context precedes this section.

3. Proposed project: A proposed project incorporates the suggested policies of this study, and offers a different approach for the design of low-income housing areas.

Complementary information can be found in the appendix and a glossary.
LOCALITIES: Eight representative localities were selected in order to present a general cross section of urban/dwelling environments with their evolution in Guadalajara.

LOCALITY SEGMENT: For purposes of comparison, a typical segment of 400m by 400m is taken from each locality. The segment shows the subdivision pattern and the circulation layout.

LOCALITY BLOCK LAND UTILIZATION DATA
LOCALITY BLOCK: Within each locality segment a typical residential block is selected, with the aim of determining land utilization, circulation length and densities in relation to number of lots, dwellings and people.

NUMBER OF LOTS
AVERAGE LOT AREA
DWELLING UNITS
DWELLING UNITS/Ha (gross)

LAND UTILIZATION DIAGRAMS 1 HECTARE
LAND UTILIZATION PERCENTAGES: Proportions of public land and private areas are compared. Their ratio determines the users control, maintenance responsibility, and functional efficiency of a layout; i.e., a high percentage of public land results in high direct costs of installation and maintenance for the city's administration, as well as high indirect costs due to inefficient use of the land.

% OF PRIVATE LAND
% OF PUBLIC LAND

NETWORK EFFICIENCY 400 X 400 MTS. 16 HECTARES
CIRCULATION LENGTHS: A relation between public circulation length and area served indicates the network efficiency; a high ratio means a less efficient network in terms of direct costs and maintenance costs.

Mts/Ha

NET DENSITY 1 HECTARE

DENSITIES: The number of persons per hectare relates to both the number of lots and the type of dwellings per hectare. This determines the intensity of land use; low densities mean higher development costs per person.
INTRODUCTION

5 TETLAN
1900
Old illegal subdivision
Low

6 COL. ECHEVERRIA
1970
New illegal subdivision
Low

7 SANTA CECILIA
1940-70
Private speculative
Mod. low, low

8 LA TUZANIA
1970
Public housing
Mod. low, Middle

LOCATION KEY/COMPARATIVE URBAN AREAS

1 CENTRO
2 SAN JUAN DE DIOS
3 SAN JUAN BOSCO
4 COL. DEL FRESCO
5 TETLAN
6 COL. ECHEVERRIA
7 SANTA CECILIA
8 LA TUZANIA

SIMILAR COMPARATIVE AREAS
LOCALITIES 1, 2, 3, 4.

SIMILAR COMPARATIVE AREAS
LOCALITIES 5, 6, 7, 8.
MATRIXES: Data of the twenty-one dwelling surveys are summarized in both, the physical, and the community facilities, utilities and services matrixes. They permit:
a) A comprehensive view of the spectrum of low income housing.
b) A determination and comparison of trends and patterns.
On the left hand side are indicated: Housing systems with tentative population figures and percentages; surveyed locality names with tentative percentages of population living in similar physical conditions. They are related to the user's income group associated to the minimum official wage; in 1978 this was $1600.00 per annum. The range varies from 1/4 to 2 times this figure.
The physical data matrix also indicates the time process of each housing systems showing: Construction period, useful period and obsolete period of every type.
Dwelling areas, lot areas, densities, and circulation lengths of the five-Main housing systems - (tenements, illegal subdivision, private speculative, public housing, and old traditional) - are plotted on the graphs.

General pattern for each housing system is as follows:

SQUATTERS: Shanties with minimum dwelling unit areas. For very low income dwellers who own the shelter but not the land. No rent or mortgage payments. Located on the city periphery. They are semi-detached units in a bad physical state. Built incrementally through self-help from wasted materials. No community facilities, utilities and services are provided.

TENEMENTS: Minimum rooms for very-low income. Rental units on private court tenements. More than 20% of their income is paid for rent. Large lots with shared laundry/toilet/bathroom. Located in the city center or inner ring, where complete community facilities, utilities and services are provided. Generally in fair physical state. Incrementally built by accretion of rooms. Managed, maintained, and controled by private landlords.
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### Time Process
- **Construction Period**
- **Useful Period**
- **Obsolete Period**

### User
- Income Type
- Area
- Tenure Location
- Type
- No. Floors
- Dwelling

### Dwelling Unit
- Rent
- Meters
- Net
- Operations
- Den.

### Dwelling Development
- Incremental
- Type
- Private
- Public
- Materials
- Not Den.

### Physical Data Matrix

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</table>
ILLEGAL SUBDIVISION: Rooms on shared lots owned by low income dwellers on illegally bought land. More than 20% of their income is invested in housing construction. Incrementally built by aided self-help. Located on the periphery. No community facilities or utilities and services are available due to the illegal tenure. Public transportation is available. Electrical wires are sometimes connected to the city's network. Gas for cooking, distributed by private companies is available.

PRIVATE SPECULATIVE: Moderate-low income dwellers. Legal purchase of lots with deficient community facilities and utilities/services. Located on the city periphery, these lots are rapidly covered with aided self-help/artisan houses that to a certain extent meet the municipal housing regulations. They are financed by private speculative companies, paying more than 20% of their income in both installment payments and building expenses.

PUBLIC HOUSING: For lower-middle income people financially stable enough to apply to the government housing agencies, that offer an instant house, community facilities, utilities and services. Located on the periphery. Generally subsidized, the percentage of income they pay for the mortgages does not reflect the initial physical conditions of the environment.

OLD TRADITIONAL: Middle income to middle-high income. Located in the city center and inner ring. Privately owned large old houses. Fair physical state. Complete community facilities, utilities and services.
<table>
<thead>
<tr>
<th>HOUSING SYSTEMS</th>
<th>LOCALITIES</th>
<th>% OF TOTAL POPULATION</th>
<th>COMMUNITY FACILITIES</th>
<th>UTILITIES AND SERVICES</th>
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<td>Total Population</td>
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</table>
CONCLUSION

It is inevitable that Guadalajra will continue to grow in the immediate future despite efforts intended to retard population inflow.

The population will double in approximately 12 years; by the year 2000 the city will contain almost six million people. 50% of that population will not be able to reach the formal housing market.

The rapid urbanization is having deteriorating effects on all aspects of life. In housing the most common pattern has become illegal subdivisions. In addition, the 4,300 hectares of government land, "ejido", surround the city acting as a counterweight to regulate private land prices. However, the slow bureaucratic procedures in the legal integration of these areas have negatively affected the urgent need to control land subdivision, land distribution, appropriate directions of growth, and to a large extent the assurance of future economical feasible provision of utilities and infrastructure.

Although government policies have proven highly inefficient and limited, public and private intervention will still be required, and large scale developments must continue to be implemented; but the instant-public-projects-approach must change. Basic action should be taken in the provision of utilities/services and community facilities over which the government has direct control and responsibility.

The provision of dwellings by the popular sector must be encouraged and supported by the government; particular consideration should be given to the very low income informal sectors that have clearly shown their ability to finance and construct their own dwellings suited to their financial and social requirements.
URBAN CONTEXT
Guadalajara, Mexico

1. PRIMARY INFORMATION. Guadalajara, the capital of Jalisco State, is situated about 540 km northwest of Mexico City. It is the second largest city in the country with two million people, representing 37% of the total state population. It is connected to all other parts of the country by an extensive highway, railway and air route network, and it plays an important role as a regional economic interaction between the center and the northwest section of the country. The city is characterized by its mild climate resulting from its location in a relatively protected wide valley in the highlands.

Guadalajara was founded by the Spanish captain Juan de Onate and a small group of people in 1541. They chose the actual site after four frustrated attempts at other sites because the final site was in a strategic position concerning the Indians, it had adequate water, and had sufficient land for agriculture. The lack of human and natural resources; ie, Indian labor and minerals; and because of the location of the mining cities to the north, the city became a commercial-administrative center from its beginning. It commanded the mining wealth and commercial markets of the north and its commercial influence determined the fate of the Pacific ports of Mazatlan, San Blas, and Manzanillo. Guadalajara was not strongly dependent on the trade with Mexico City, the capital.

2. HISTORY. When the Spaniards conquered Mexico during the years 1519 to 1521, the area contained an Indian people that were scattered in small villages and that cultural, linguistic and racially were ambiguous and distant from the greatest Mexican cultures of the central region.

3. ECONOMY. Commerce has been the mainspring of Guadalajara. This has lead to the concentration of services at a regional scale including education, health, culture, finances, religion, and tourism. It is a natural conduit for merchandise and products to and from the center of Mexico to the northwest regions. It controls the trade of foodstuffs, fruits and vegetables of the northwestern part of the country. In 1970, 29% of the city's population was in the labor force, 34% of these were officially unemployed, but the actual figure seems to be higher. 64% of the labor force was employed in agriculture and cattle raising.

Industry and crafts play a secondary role in the economy because most of manufactured goods come from Mexico City, Monterrey and the U.S.A. The sector provides jobs for 39% of the labor force. Commerce and services provide jobs for 51% of the labor force and is the backbone of Guadalajara's economy.

4. GOVERNMENT. The state of Jalisco has an area of 80,150 km². It is divided into 124 municipalities, including Guadalajara which is by far the dominant. The PRI candidate for state governor is appointed by the presidential candidate, following a pattern of reconciliation of federal and local interests. The candidate competes in elections against very weak or generally token opposition and is elected. The authority is for six years. The different state department delegates are appointed directly by the governor and their authority is limited to their respective departments, taxation, public works, health, education, etc. The city is governed by a president and officials who are elected every three years. The state governor however, has a strong influence in local city affairs due to the comparative importance of the city at state level. The Guadalajara metropolitan area encompasses four municipalities, but they have relatively little power to tax or to mobilize fiscal resources. Major services are provided on a shared basis between federal, state and local government but principal action is concentrated on only one out of the four municipalities as a consequence of the lack of coordination and uneven resource distribution among them.

Since the 60's a department of urban planning was formed, which is responsible for coordination and control of projects related to urban growth. Unfortunately, duplication of functions, extensive bureaucracy and strong interests obstruct the formulation of useful and effective policies concerning low-income housing.

5. DEMOGRAPHY. Although between 1910 and 1920 the population of the country dropped because of the revolution, Guadalajara's population increased by 20% due mainly to low revolutionary participation. In the decade of the 20's an equilibrium between urban and rural population growth was
achieved caused by the distribution of rural land after the revolution.

From 1940 to 1950, the general economic development of the country started. The cities offered new opportunities and Guadalajara grew by 64%.

In the 1950's, migration from rural areas reached a peak with the population increased 96% of which the rural migration represented 58%.

Between 1960-1970, the population growth was 62% and rural migration slowed down. By 1976 the metropolitan population exceeded 2 million. It is estimated that the city will contain 5.5 million by the year 2000.

6. SOCIO-CULTURAL. The social system, as in most of the country, is one in which traditional values, institutions and patterns coexisted with those arising from economic development and social change. But equality of participation in socio-economic development has been only partially successful. Even when there are no major ethnic or cultural differences, three characteristic class lines can be distinguished. The upper class - large storekeepers, landlords, owners of the means of production - hold the highest political positions. The middle class - small, emergent, and heterogeneous - occupies mid-level professional, commercial and bureaucratic positions. In the lower class, economic and cultural variation are largest than in the others. It is composed of blue collar workers to recent migrants, urban dwellers living in tenement slums or illegal settlements. They reap few benefits from the economic expansion which excludes them.

Guadalajara for centuries has been represented by traditional ideas and thought that have strongly characterized its socio-cultural development, the Roman-Catholic church and low-risk speculative/commercial activities are the main examples.

7. SOCIO-ECONOMIC. 54% of the population, the low and very low income, earn less than US $ 900 per annum. (1970).

50% consist of moderately low and middle low income who earned less than US $ 1800 a year. (1970), while 10% made between US $ 1800 and US $ 3000.

36% of the labor force was paid less than the official minimum wage in 1970.

The rest comprise high-income groups.

8. URBAN GROWTH. In a span of 40 years, from 1900 to 1940, the population and the area of the city increased two times. In contrast, between 1960 to 1975 the population and the area increased three times.

This unexpected and unplanned expansion has always been at the expense of relatively fertile agricultural land. In addition to this, absence of severe natural features of the Atenej e valley, strong land speculation, and the lack of regulations regarding urban concentration, have promoted uncontrolled urban sprawl.

It is estimated that the city will contain 5.5 million by the year 2000.

The city government maintains a housing program that deals with the upgrading of tenements, the results, in terms of dwelling units up-graded are still very poor. Only 10% of the total number of tenements have been upgraded.

Since 1974, self-help programs sponsored by the city government have been developed, unfortunately without successful results.

The state government, through the planning department, is trying to implement a new housing program based on the concept of site and services. The aim of this program is to provide, at least, 200 Has. per year of low-income projects financed with public resources; before it gets started, contradictions in the provision of services and community facilities, or in the provision of dwelling units. The contribution of the government only accounts for 6% of the stock.

The private sector, since 1970 has been able to solve the land/dwelling shortages without any kind of support, by illegally settling on government land "ejidos".

It is estimated that in order to cope with the urbanization demand, 400 Haci. of land and annually necessary. From 1970 up to the present time, about 1000 Haci. have been informally occupied by the low-income, following the pattern of illegal subdivisions.

From now on, the government has to deal with this unprecedented demand for services that, as soon as consolidation occur, will represent a serious political pressure. Since no signs of radical solution to the "ejidos" problem are in sight, the situation will tend to worsen.

The following low-income housing systems, the approximately served population, and the responsible sector are indicated:

- Squatters. 1% Populace
- Tenements. 17% Private/popular
- Illegal subdivision. 16% Popular
- Private speculative. 35% popular/private
- Public housing. 64% Public
- Old traditional. 13% Private/popular

(further information can be found in the introduction, and case study sections of this work.)
URBAN TOPOGRAPHY AND CIRCULATION: The Atemajac Valley in which the city is located, is 1550 mts. above the sea level. It is bounded by the Santiago river that meshes with the Verde river to the northeast. The Primaverillas enclose the valley to the west and several small hills encircle the city to the south.

The urban circulation pattern is determined by the commercial activities and business operations typical of the traditional city center, where all urban transportation routes cross. Regional traffic is canalized from and to the main highways by a recently built peripheric road that is encouraging numerous settlements outside the valley's limits.

URBAN GROWTH PATTERN

URBAN GROWTH: Originally three principal small towns, Atemajac to the north, Zapopan to the northwest, and San Pedro to the Southeast, where located as independent semi-rural communities around the old compact city.

Up until 1940 the physical development of the city followed a pre-automobile pattern. The different parts of the city were clearly defined following a simple neighborhood model. From 1940 to 1960, the economic expansion, rural migration, extensive introduction of automobiles, land speculation and the general urgent pressure of rapid urbanization altered the old steady development and the population increased 160% in this period.

From 1960 to 1975 the rapid growth of the last period continued.
**URBAN LAND USE PATTERN**

Main commercial activities are concentrated in the city center and along principal avenues. American, car-oriented shopping centers for high income people have recently been built in different parts of the city, but the historical importance of the core remains.

The location of industry follows a linear pattern along an east-west axis that parallels railroad access. New industrial areas have been started, but they remain relatively minor and sparsely developed. Some manufacturing industries and craft industries are scattered throughout the city according to the economic advantages of their location; the strongest are involved in popular crafts: San Pedro and Tonalá, both to the southeast.

Practically all community facilities are concentrated in a 4 km radius from the historical center.

**URBAN DENSITY PATTERN**

The highest densities are located around the historical nucleus and in the old towns that surround the city. This concentration is due to the abundance of tenements, old speculative developments and old traditional types of settlements. Complete utilities, services and community facilities are provided in these areas.

Medium densities are found in new speculative developments, old illegal developments, as well as old high-income suburbs and middle-income communities.

Low densities are found in the areas newly developed since 1970.

Increasing commercial pressure, rising rents, and high land taxes to pay for various large-scale public works in and around the old historical high density areas, are displacing low-income dwellers towards the outskirts of the city.
URBAN INCOME PATTERN

Low and very low income groups are settled in the center and towards the eastern side of the city, but they are now settling outside of these areas particularly in the north, northeast, south, and southwest, where availability of government land ("tierra ejidal") allowed an uncontrolled flow despite the lack of services or community facilities. Moderate-low and middle income groups are located in both the inner ring and in some peripheral new developments on the western side contiguous to high and very high income settlements. These two groups, who own the land in the inner ring, initially changed their former dwellings into rental units but now are displacing the tenants in order to speculate with the land expecting a higher commercial revenue in the future.

URBAN LAND VALUE PATTERN

The land values follow a similar pattern paralleling urban growth. Very high values are concentrated in the historical center as well as along main commercial avenues. High values surround this area at a radius of 3 km but vary somewhat according to the level of services and to the commercial potential of the area. Low and very-low values are found mostly in new speculative developments, new low-income settlements, old and new illegal developments and social depressed areas.

AERIAL PHOTOGRAPHS, OPPOSITE PAGE: THE FOUR CASE STUDY LAYOUTS: (top left) San Juan de Dios. (top right) Colonia Echeverria. (bottom left) Santa Cecilia. (bottom right) La Tuzania
LOCATION: The area of Guadalajara known as San Juan de Dios is adjacent to the central commercial zone, only separated by the Calzada Independencia, a main circulation avenue running north-south.

ORIGINS: Originally the natural limits of Guadalajara were bounded to the east by the San Juan de Dios river that today runs in pipes below the Calzada Independencia Avenue, carrying the main sewage of the city. On the other side of the river a very low-income community started to develop in the 17th century. Numerous stables and farms were also located there. An orphanage and several churches built during the seventeenth and eighteenth centuries complemented the commercial activities. As opposed to the city center commercial area a “tianguis” (informal market) developed that soon became the city’s low-income market and regional fruit/vegetable trade center. These activities provided employment and opportunities for marginal employment which attracted new low-income families. These groups generally lived in expressly built tenements or in rental rooms in single-family dwellings.

After the channelization of the San Juan de Dios River and the remodeling of the city center in the 1950s the commercial activities expanded into the old big houses situated along the Calzada Independencia, Obregon, and Mina Avenues. Small-scale industrial activ-
ities also developed, as well as entertainment centers, second class hotels, public baths, etc., which displaced the stables and forms towards the surrounding areas located mainly toward the east.

At the present time, only few single-family houses are left, for most have been converted into shops/industry, apartments and tenements.

The availability of services and community facilities as well as multiple sources of employment and marginal employment derived from another market constructed in the mid 50's accentuated the housing demand which was met mostly in the form of tenement rooms.

Continued expansion of commercial and industrial activities has confined the low-income families to the east of the remaining densely populated central area.

POPULATION-INCOME: The population of San Juan de Dios is composed of a heterogeneous working class of very low and low income people. A relatively small proportion of moderate-low income residents has given rise to distorted image of the locality population characteristics.

LAYOUT: The street pattern of the area follows a typical Roman-Spanish grid layout continuing from the city center. The blocks become larger as a result of the small natural slope of the site. Streets are 12m. wide and there are only few open spaces, therefore the street is used intensively by both pedestrians and vehicles.

Its boundaries to the north are not clearly defined so the locality meshes gently with the adjacent neighborhood. To the south a man-made barrier, Revolucion Avenue confines the neighborhood and separates it from a relatively dense low-income area; the Belisario Dominguez Avenue bounds the locality to the east which also acts as a barrier to a private speculative development built in the 1940's; and to the west, separated from the city center by the Calzada Independencia and only linked by several pedestrian bridges, the locality is limited by a dense and busy commercial area whose main nucleus is the San Juan de Dios market.

PHOTOGRAPHS, OPPOSITE PAGE:
SAN JUAN DE DIOS: (top) Characteristic marginal employment in the San Juan de Dios Plaza.
(left) San Juan de Dios Public Market; stalls invading the street.
(right) A typical residential street.
LAND USE: Up to the present time, San Juan de Dios is the most heterogenous area in the city. The western side has mainly commercial uses mixed with residential; this pattern is also found along the main streets perpendicular to Calzada Independencia Avenue. Light industry and small commercial enterprises are scattered throughout the locality. Tenements, apartment houses and single-family dwellings encompass the rest of the area.

However, residential use is slowly being displaced from the center of the locality around the market.

There are a large number of community facilities primarily concentrated on the western side. There is a lack of open recreational space and community facilities towards the eastern side. There is apparently a lack of semipublic land because of the overcrowding seen in the schools, churches and markets.

LOCALITY LAND UTILIZATION DATA

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KEY

- F: Parking
- P: Police
- F: Fire Department
- S: School
- C: Church
- R: Recreation
- L: Library
- U: University
- H: Health
- PO: Post Office
- SS: Social Services
- M: Market
- C: Cemetery
- B: Bus
CASE STUDY: SAN JUAN DE DIOS

CIRCULATION: All streets are paved and available to both vehicular and pedestrian use, but due to the layout of the city, most of the through traffic runs east-west.

Major city arteries bound three sides of the locality: Calzada Independencia Avenue and Calzada del Ejercito Avenue run north-south; Revolucion Avenue runs east-west. The fourth side is bounded by a local street that serves as a meshing boundary with the adjacent community. Another major city artery, Javier Mina Avenue, crosses the site dividing it into two similar areas linked by several pedestrian bridges connecting the market.

Pedestrian circulation to and from the city center is canalized by several pedestrian bridges that cross the Calzada Independencia Avenue.

Extensive traffic lights and traffic signs are placed throughout the locality to regulate and control traffic.

Limited parking facilities exist on top of the San Juan de Dios market and adjacent buildings.
LOCALITY CONSTRUCTION TYPES

<table>
<thead>
<tr>
<th>Construction Type</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shack</td>
<td>100%</td>
</tr>
<tr>
<td>Predominantly Wood</td>
<td></td>
</tr>
<tr>
<td>Masonry</td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td></td>
</tr>
</tbody>
</table>

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

LOCALITY UTILITIES AND SERVICES

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

LOCALITY COMMUNITY FACILITIES

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

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

NETWORK EFFICIENCY

Network length (streets, walkways) = 200 m/ha
Areas served (total area) =

LOCALITY SEGMENT PLAN

Network efficiency (streets, walkways) = 200 m/ha
Areas served (total area) =
LOCALITY SEGMENT: The typical segment is essentially residential. The typical blocks are 100m long with an average street width of 12m. Like other old settlements, land coverage is quite high. At this scale the characteristic long courts of the tenements are clearly shown. The rational economical subdivision of the site, and the definite public space around the mass of the blocks is also clear.

BLOCK: Like most other blocks in this area, the original block subdivision has been altered to increase the number of lots. Many single-family dwellings have been converted into tenements, or the lots have been subdivided into relatively small sizes to build rental low-income, individual houses or small walk-up apartments.

A spontaneous variety of choices in terms of dwelling characteristics is found as a result of a free or natural progressive subdivision of the block. All the blocks have a narrow sidewalk of 1m. The streets, especially those running north-south are used as children's playgrounds or as an extension of the private areas, due to the absence of vehicular traffic in that direction.

The left side of the street is generally used as parking, allowing only one vehicle to pass.
URBAN CASE STUDIES

SECTION

ELEVATION

PLAN

CASE STUDY SOURCES

Plan: (approximate) CATASTRO Air photograph and plans, 1975.
Field survey 1976-1977. DPUEJ.

Land Use Pattern: (approximate) IBID
Circulation Pattern: (approximate) IBID
Segment Plan: (approximate) IBID
Block Plan: (approximate) IBID
Typical Dwelling: (approximate) Field survey 1976-1977

Physical Data: (accurate) IBID
PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
- type: Room
  - area (sq m): 20
  - tenure: Legal Rental

LAND/LOT
- utilization: Semi-Private
  - area (sq m): 480
  - tenure: Legal Rental

DWELLING
- location: City Center
  - type: Row/Grouped
  - number of floors: 1
  - utilization: Multiple
  - physical state: Fair

DWELLING DEVELOPMENT
- mode: Incremental
- developer: Private
- builder: Small Contractor
- construction type: Adobe-Masonry-Wood
- year of construction: 1941

MATERIALS
- foundation: Stone
- floors: Cement Tiles
- walls: Adobe-Brick
- roof: Brick Vaults

DWELLING FACILITIES
- WC: 3, Shared
- shower: 3, Shared
- kitchen: 1, Shared
- rooms: 1
- other: Shared Laundry Facility

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
- user's ethnic origin: Northern Guadalajara
- place of birth: Jalisco
- education level: Primary

NUMBER OF USERS
- married: 4
- single: 1
- children: 1
- total: 5

MIGRATION PATTERN
- number of moves: 2
  - rural - urban: 1950
  - urban - urban: 1969
- why came to urban area: Employment

GENERAL: ECONOMIC
- user's income group: Very Low
- employment: Watchman
- distance to work: 5 Km
- mode of travel: Public Transportation

COSTS
- dwelling unit: $ 600
- land - market value: $ 20,000

DWELLING UNIT PAYMENTS
- financing: $ 15 / Month
- rent/mortgage: $ 15 / Month
- % income for rent/mortgage: 30 %

PHOTOGRAPHS:
- SAN JUAN DE DIOS: (top) Commercial street adjacent to the market.
  (left) A tenement court.
  (right) A dwelling unit in a tenement.
LOCATION: This is a newly developed area located on the southern fringe of the city, about 5 km away from the city center. The new industrial area is adjacent to the northern side.

ORIGINS: The declining national economic situation, that makes impossible for the majority of the population to pay for the typical low-income lots in private speculative developments, the surplus of government land ("ejidos") around the city, and the incapacity of the authorities to lower urban design standards in order to cope with the increasing demand, combined with the massive migration to the city during the last seven years, have provoked these types of illegal developments. The site, formerly used for agriculture, was cultivated by peasants ("ejidatarios") that began to sublet or sell the land when they found that the housing demand made this illegal operation more profitable than growing crops. By 1970 only the area adjacent to 8 de Julio Avenue was occupied by dwellings, in 1975 more than 80 ha had been sold for residential use but still 200 ha of cultivated land were in use. It is estimated that by now more than 150 ha have been sold. It is not difficult to foresee that in four more years the whole area of 280 ha would be occupied without any kind of services or community facilities.
The community layout has resulted from the regular subdivision of typical agricultural parcels of approximately 200m by 200m. Only the 22nd Street is semi-diagonal due to the bus connection from one of the city bridges to the city center.

The most consolidated area is located to the west bounded by the 8 de Julio Avenue separating the community from a recently built speculative development.

To the north the new industrial area limits the site and offers some job opportunities. To the south is a water canal that is being used as a source of water even though the water has not been treated. Across this canal similar illegal developments have been appearing on the hilly areas of the Cerro del Cuatro Hill. The government land extends to the east towards the Calzada de la Higuerillas Avenue.

A new city avenue will cross the settlement. An aqueduct crosses the site from east to west. The city slaughter house is located in the north-east corner.

The site is flat with no special obstacles to urban development; it is expected that in four more years it will be completely saturated following the same layout.
LOCALITY LAND UTILIZATION DATA

DENSITIES

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Total</th>
<th>Hectares</th>
<th>N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>2,340</td>
<td>63</td>
<td>37</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>3,020</td>
<td>63</td>
<td>48</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>18,000</td>
<td>63</td>
<td>285</td>
</tr>
</tbody>
</table>

AREA TOTALS

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL EJIDO LAND</td>
<td>280</td>
<td>100</td>
</tr>
<tr>
<td>INVADED (1975)</td>
<td>82</td>
<td>28</td>
</tr>
</tbody>
</table>

LOCALITY LAND USE PATTERN

KEY

- S: School
- M: Market
- Bus

AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- SEMI-PUBLIC
- AGRICULTURAL

SCALE: 1:10000

UNITED SUR
ACUEDUCTO OESTE 2
ACUEDUCTO ORIENTE 2
MIRAVALLE
CIRCULATION: There is no through traffic inside the settlement. All streets are accessible to vehicles but they are rarely used, except for delivery trucks. None of the streets are paved. A regular bus service at about 15 minutes intervals is provided; it connects with the city center in 20 minutes. A rough stone road, the 8 de Julio Avenue, is the only relatively fast link with heavy traffic to and from the central areas. The Canal de Demasias road is mostly used by farm trucks.

LAND USE: In 1975, privately owned land occupied 30% of the whole area. Agricultural parcels comprised the rest. The plan does not anticipate the provision of semi-public land for community facilities, only a small rectangular area on the 9th Street has been left without residential uses. A sand quarry that supplies construction materials is located on the south-east side. Small commercial enterprises are concentrated along the 8 de Julio Avenue. Most of them sell construction materials. Daily food purchases are from street vendors and in very small stalls or corner shops located in the densest areas. The adjacent Lomas de Polanco speculative development provides limited community facilities for some of the settlers.
LOCALITY CONSTRUCTION TYPES

<table>
<thead>
<tr>
<th>Material</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shack</td>
<td>90</td>
</tr>
<tr>
<td>Mud/Wattle</td>
<td>10</td>
</tr>
<tr>
<td>Wood</td>
<td>0</td>
</tr>
<tr>
<td>Masonry</td>
<td>0</td>
</tr>
<tr>
<td>Concrete</td>
<td>0</td>
</tr>
</tbody>
</table>

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

LOCALITY UTILITIES AND SERVICES

<table>
<thead>
<tr>
<th>Utility</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitary Sewerage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storm Drainage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refuse Collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paved Roads, Walkways</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Street Lighting</td>
<td></td>
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</tbody>
</table>

LOCALITY COMMUNITY FACILITIES

<table>
<thead>
<tr>
<th>Facility</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Police</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schools, Playgrounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreation, Open Spaces</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

NETWORK EFFICIENCY

Network length (streets, walkways) = 229 m/ha
Areas served (total area)
CASE STUDY: COL. ECHEVERRIA

CALLE 5A 165

LAND UTILIZATION DIAGRAMS

LOCALITY SEGMENT: This area of the locality was selected in order to show and differentiate four stages of development: untouched, cultivated agricultural land, and three distinct stages of block consolidation and lot subdivision.

At this scale the land subdivision at the expense of the agricultural land is easily observed. The relatively flat site with a 1% slope does not present any obstacles for the settlers on which to build.

BLOCK: The block is the result of the subdivision of an agricultural parcel of land, measuring approximately 200m by 200m, when divided into three parts of 60m by 200m. Lots of 10m by 10m placed back-to-back are used as the minimum average piece of land available.

The result of this is a high circulation per unit ratio, a situation that would eventually be negative when utility networks are to be installed. This could be remedied by encouraging the people to sell half of the lot to someone else. On the other hand, very wide streets of approximately 15m at 60m intervals will augment public land percentages to a considerable extent, increasing the cost of the utilities networks in both installation and maintenance costs. This could be solved by enclosing big block units with some sort of semi-private condominiums.

At this stage only one or two room dwelling units have been built. A strong rural background is clearly noticed in the way they use the lots for cattle rising, poultry, crops, etc.

LOCALITY BLOCK LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th>DENSITIES</th>
<th>Total Number</th>
<th>Area Hectares</th>
<th>Density N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>30</td>
<td>.80</td>
<td>37</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>38</td>
<td>.80</td>
<td>48</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>228</td>
<td>.80</td>
<td>285</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways)</td>
<td>.24</td>
<td>23</td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>.80</td>
<td>77</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.04</td>
<td>100</td>
</tr>
</tbody>
</table>

NETWORK EFFICIENCY

- Network length (streets, walkways) = 219 m/ha
- Areas served (total area):
  - LOTS: Average area, dimensions = 266 m², 10/25
POPULATION-INCOME: The population in the Echeverria-Domingo Savio settlement belong to the very low and low income strata. Some of them are moderate low-income but do not reflect the typical characteristics of the community. Obviously none of the population is dealing with official housing agencies. From an occupation stand point, this is a very heterogeneous population. There are municipal workers, street vendors, qualified factory workers, masons, drivers, mechanics, etc.

CASE STUDY SOURCES

<table>
<thead>
<tr>
<th>Plan: (approximate)</th>
<th>CEPAL/UNESCO Photographs and plans, 1975.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use Pattern:</td>
<td>(approximate) IBID, 1975.</td>
</tr>
<tr>
<td>Circulation Pattern:</td>
<td>(approximate) IBID, 1975.</td>
</tr>
<tr>
<td>Block Plan:</td>
<td>(approximate) IBID, 1975.</td>
</tr>
<tr>
<td>Typical Dwelling:</td>
<td>(accurate) IBID, 1975.</td>
</tr>
<tr>
<td>Physical Data:</td>
<td>(accurate) IBID, 1975.</td>
</tr>
<tr>
<td>Other Information:</td>
<td>The Author 1976-1977-1978,</td>
</tr>
<tr>
<td></td>
<td>Field survey 1976-1977-1978,</td>
</tr>
<tr>
<td></td>
<td>INPUE, ITESO 1974, H. Apartments</td>
</tr>
<tr>
<td></td>
<td>de Guadalajara.</td>
</tr>
</tbody>
</table>

KEY

- R Room (multi-use)
- K Kitchen/Cooking Area
- L Laundry
- W Well
- P Pit Leatine
PHYSICAL DATA
(related to dwelling and land)

**DWELLING UNIT**
type: Room
area (sq m): 24
tenure: Legal Ownership

**LAND/LOT**
utilization: Semi-Private
area (sq m): 250
tenure: Extra-Legal

**DWELLING**
location: Inner Ring
type: Row/Grouped
number of floors: 1
utilization: Multiple
physical state: Fair

**DWELLING DEVELOPMENT**
mode: Incremental
developer: Popular
builder: Aided Self-Help
construction type: Masonry
year of construction: 1973

**MATERIALS**
foundation: Stone
floors: Dirt
walls: Brick
roof: Brick Vaults

**DWELLING FACILITIES**
wc: Pit Letrine
shower: -
kitchen: 2
rooms: 2
other: 

SOCIO-ECONOMIC DATA
(related to user)

**GENERAL: SOCIAL**
user's ethnic origin: Northern Mexican
place of birth: Amatlan, Nayarit
education level: Primary

**NUMBER OF USERS**
mature: 4
single: -
children: 8
total: 12

**MIGRATION PATTERN**
number of moves: 2
rural - urban: 1969
urban - urban: 1973
urban - rural: -
why came to urban area: Employment

**GENERAL: ECONOMIC**
user's income group: Low
employment: Bus Driver
distance to work: 2 Km
mode of travel: Public Transportation

**COSTS**
dwelling unit: $ 1,200
land - market value: $ 900

**DWELLING UNIT PAYMENTS**
financing: Popular
rent/mortgage: None
% income for rent/mortgage: 0

PHOTOGRAPHS:
COLOMIA ECHEVERRIA: (top) A typical wide street. Note the construction materials in front of the houses.
(bottom left) An internal court shared by two families.
(bottom right) A dwelling unit with a brick-vault roof.
3 SANTA CECILIA
PRIVATE SPECULATIVE

LOCATION: Santa Cecilia is located in northeastern Guadalajara, and is approximately 7 km from the city center. The area slopes steply toward the Santiago River Ravine on the east.

ORIGINS: The project is one of several private speculative developments known as "colonias populares", which were built in the city at the end of the 1960's. It is a project built through private investments following the urban design norms of the city, and offers a site and varied services, plus limited community facilities progressively built by different government agencies according to the saturation of the project. The target income was the moderate to low income who could afford the lots on an installment plan controlled and financed by private speculative companies that were at that time the most significant source of urbanized land. The houses were built by self-help or aided self-help. Almost all the eastern zone of the city including that of the project has been developed in a similar way since 1940. The present socio-economic conditions make this kind of project inaccessible for the same income groups.

LAYOUT: The project is limited to the west and south by wide meshing streets that connect the locality with similar speculative developments as well as public housing projects. To the north a small street separates it from cultivated agricultural land. To the east a future periphery road will enclose the locality dividing the urban area from a ravine. The ravine functions as a secondary sewage collector channeling the open sewage discharges of the adjacent projects into the Santiago River.

Santa Cecilia has a standard gridiron layout allowed by present site planning regulations and encouraged by private speculators. It responds to the need of providing small lots with direct access to public space, but is penalized by excessive public circulation/network lengths that increase direct costs and public municipal responsibility in terms of maintenance. In addition the steep slope of the site, and the illegal a-posteriori subdivision of lots have considerably overloaded all service networks and community facilities giving rise to numerous problems to the settlers.

LAND USE: The locality is largely residential, there is no industry; commercial activities are located along Joaquin Amaro Avenue which is the most important artery. Small shops for daily purchases are located on the more frequented corners. The area is not provided with sufficient semi-public land, so streets are used as children playgrounds as well as providing space for street vendors and other complementary activities like fairs, festivals, theaters, etc. A hand-made brick factory is located on the northwest side of the settlement supplying large quantities of construction material highly need at this stage of development. The Parque De La Lira is a semipublic space about 80% useless due to the step slope on which it is located. Despite this open surrounding areas are being used as public playgrounds. A large church has been recently built at people's expense. Health, social, and police facilities are provided. A public market and a school are already finished; the worst site areas were randomly designated for those functions.

CIRCULATION: The major vehicular movement is generated from and to the city center, with the main connection being the Calzada Del Obrero Avenue. Public transportation connects the locality with the city, a bus terminal is located on the northwest side of the community, another terminal is located on Calzada Del Obrero Avenue connecting to the trolley system. The only important interior road is the Joaquin Amaro Avenue carrying most of the locality traffic. It has a right-of-way of 20 meters. All streets are open to both vehicular and pedestrian traffic; there are two different street widths: one of 12 meters and the other of 8 meters. However the latter runs only in an east-west direction where the steep slope makes it very difficult for vehicles to circulate. All streets have a rough stone surface that reduces vehicular speed. Boundary streets are not extensively used by vehicles at this stage, only the Calzada Del Obrero Avenue has relatively heavy traffic at low speed. Very few people owns cars, walking is the main means of movement. The only vehicles are public buses and working trucks.
CASE STUDY: SANTA CECILIA

Locality Land Use Pattern

Locality Land Utilization Data

<table>
<thead>
<tr>
<th>Densities</th>
<th>Total Number</th>
<th>Area (Hectares)</th>
<th>Density (N/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lots</td>
<td>6,500</td>
<td>55</td>
<td>118</td>
</tr>
<tr>
<td>Dwelling Units</td>
<td>6,500</td>
<td>55</td>
<td>118</td>
</tr>
<tr>
<td>People</td>
<td>39,000</td>
<td>55</td>
<td>710</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Areas</th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public (streets, walkways, open spaces)</td>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>Semi-Public (open spaces, schools, community centers)</td>
<td>6.5</td>
<td>7</td>
</tr>
<tr>
<td>Private (dwellings, shops, factories, lots)</td>
<td>55</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>88.5</td>
<td>100</td>
</tr>
</tbody>
</table>

Network Efficiency

- Network length (streets, walkways) = 287 m/Ha
- Areas served (total area)
URBAN CASE STUDIES

LOCALITY CONSTRUCTION TYPES

<table>
<thead>
<tr>
<th>Construction Type</th>
<th>0%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mud/Wattle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masonry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES

- Water Supply
- Sanitary Sewerage
- Storm Drainage
- Electricity
- Gas
- Refuse Collection
- Public Transportation
- Paved Roads, Walkways
- Telephone
- Street Lighting

LOCALITY COMMUNITY FACILITIES

- Police
- Fire Protection
- Health
- Schools, Playgrounds
- Recreation, Open Spaces

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: None, Limited, Adequate.

Quality of information: Accurate

SELECTED BLOCK

NETWORK EFFICIENCY

Network length (streets, walkways) = 325 m/ha
Areas served (total area)

LOCALITY SEGMENT PLAN

Network length (streets, walkways) = 325 m/ha
Areas served (total area)
Locality Segment: The selected segment clearly shows how the layout relates poorly with the topography so that walking is very difficult, construction and maintenance of utilities are complicated, and lots increase construction costs for the users. The highly inefficient gridiron layout was intended to be improved by increasing block lengths but access, particularly walking, was made very difficult and inconvenient without really reducing network lengths or increasing private areas.

Block: The block is representative of those found in most of the speculative developments built in the city since the 1960's. The original lot size was 10m by 15m that later was illegally subdivided by the developer into two of 5m by 15m. The size of the lots determined the network intervals which resulted in a high installation and maintenance costs. Most of the houses are being built by self-help. The building process is as follows:
1- Staking out the lots when people move in.
2- Building of a temporary shelter either on the front or in the back of the lot.
3- Construction of permanent rooms, generally of brick walls and vaults on concrete beams.
4- Building of a second floor to house another family.

Locality Block Land Utilization Data

<table>
<thead>
<tr>
<th>Densities</th>
<th>Total</th>
<th>Area Hectares</th>
<th>Density N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>52</td>
<td>.44</td>
<td>118</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>52</td>
<td>.44</td>
<td>118</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>312</td>
<td>.44</td>
<td>710</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Areas</th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways)</td>
<td>.21</td>
<td>13</td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>.44</td>
<td>67</td>
</tr>
<tr>
<td>TOTAL</td>
<td>.65</td>
<td>100</td>
</tr>
</tbody>
</table>

Network Efficiency
Network length (streets, walkways) = 300 m/Ha
Areas served (total area) = 163

Locality Block Land Utilization

<table>
<thead>
<tr>
<th>Patterns</th>
<th>Public: streets, walkways</th>
<th>Private: lots, dwellings</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Land Utilization Diagrams</th>
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<tbody>
<tr>
<td>16 Hectares</td>
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</table>

<table>
<thead>
<tr>
<th>Percentages</th>
<th>Streets/Walkways: 33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwelling/Lots: 67</td>
<td></td>
</tr>
</tbody>
</table>
POPULATION-INCOME: The majority of the population is urban moderate-low and very low income. They are migrants from urban areas that have been living in the city for several years. The population is employed in the services sector. They belong to unique social, ethnic, religious, and occupational backgrounds. The project will accommodate a population of 40,000 inhabitants.
PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
- type: House
- area (sq m): 52
- tenure: Legal Ownership

LAND/LOT
- utilization: Private
- area (sq m): 75
- tenure: Legal Ownership

DWELLING
- location: Periphery
- type: Row/Grouped
- number of floors: 1
- utilization: Single
- physical state: Fair

DWELLING DEVELOPMENT
- mode: Incremental
- developer: Popular
- builder: ALGod Self-Help
- construction type: Masonry
- year of construction: 1971

MATERIALS
- foundation: stone
- floors: Cement Tiles
- walls: Brick
- roof: Brick Vaults

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

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
- user's ethnic origin: Northeastern Guadalajara
- place of birth: Jalisco
- education level: Primary

NUMBER OF USERS
- married: 2
- single: 1
- children: -
- total: 3

MIGRATION PATTERN
- number of moves: 2
- rural - urban: 1961
- urban - rural: 1971
- urban - urban: -
- why came to urban area: Employment

GENERAL: ECONOMIC
- user's income group: Mod. Low
- employment: Police Officer
- distance to work: 8 km
- mode of travel: Public Transportation

COSTS
- dwelling unit: $2,500
- land - market value: $1,800

DWELLING UNIT PAYMENTS
- financing: Private
- rent/mortgage: $15 / Month
- % income for rent/mortgage: 16 %

PHOTOGRAPHS:
- SANTA CECILIA: (top) Southern section of the locality. Note the public market on the extreme left.
- Bottom left: A characteristic street with rough stone paving on the steep slope.
- Bottom right: A multi-use room in a single family dwelling.
4 LA TUZANIA
PUBLIC HOUSING

LOCATION: The project is located 10 km north-west of the city center, 45 minutes away by bus. It is inside the Zapopan municipality boundaries and covers an area of approximately 60 has. Its boundaries on the north and west are agricultural land that will soon be converted to urban use, as in the case of the project. To the south is a speculative development, which is growing very rapidly. To the east across the peripherical road of the city, is a similar government project linked with La Tuzania by a pedestrian bridge. The site is approached by the Santa Margarita Avenue which connects the city center through the old town of Zapopan.

ORIGINS: La Tuzania is one of the largest public housing projects being developed in the city. It was begun in 1972 under the national programs of INFONAVIT (National Institute of Worker's Housing Funds) the largest public housing agency in Mexico. It is to be completed in 1978. The design norms are generally copied from developed nations but also complemented with "technocratic esthetic" criteria that ignores the local social conditions and the reasonable utilization of the scarce resources of the country. To date only four sections have been completed. This kind of instant project has been the most important government response to housing shortages. It focuses on the provision of finished houses for lower-middle and moderate-low income people.

LAYOUT: The area of the city where the project is located, has been developed by private speculators since the completion of a city peripherical road about seven years ago. The site is relatively flat. The layout follows a graphic-design pattern with no attention to costs -- auto oriented streets even though there are no cars, American commercial center concept instead of public markets and small corner shops -- conditions that make an excessive waste of land and increase maintenance costs.

The lot size is the basic dimension for the intervals between public circulation networks, either vehicular or pedestrian. Since the lots are so small this dimension is determined by the size of two lots back-to-back which increases both the length and area of public circulation. This situation is aggravated by the extensive use of zig-zags in the layout. The only physical constraint on the layout is a high tension line which crosses the site west of the city center, 45 minutes away with a wide right-of-way which is designated as a public playground.

LAND USE: The site is entirely free of industry; no small stores or service shops are provided within the project. However some people use their front rooms as a store, service shop or kindergarten. Field observations indicate that local shops and street vendors are scattered throughout the area.

Since some of the surrounding developments are comparatively deficient in community facilities, such as schools or playgrounds, over extended use of the project community facilities might be expected.

Very high percentages of public areas result in high installation and maintenance costs for the streets, public green areas, street playgrounds, walkways and public parking lots. The percentage of semipublic areas is very low. There is no clear definition of the utilization of open spaces in the whole project. Better land subdivision with specific designated uses would diminish the percentage of public land. All communal facilities are located along main vehicular avenues, though the percentage of people owning cars is very low. Private areas are used mainly for individual dwellings. Walk-up apartments were originally planned, but due to a recent change in the local INFONAVIT policies, this land will also be used for individual houses.

LOCALITY PLAN

CIRCULATION: The project is connected to the city by the Santa Margarita Avenue, which carries the main vehicular and pedestrian traffic through Zapopan. It is also a meshing boundary with a new speculative development, Santa Margarita, located to the south. A very wide right-of-way along the peripherical road bounds the site to the east. It takes all vehicular by-pass traffic from and to north-south highways, and acts as a barrier with a similar INFONAVIT project across this road. However, only two lanes have been paved. On the north, the old Tuxiapan road remains without significant traffic.
LOCALITY LAND USE PATTERN

LOCALITY LAND UTILIZATION DATA

DENSITIES

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Area</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>3,530</td>
<td>29.4</td>
<td>120</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>3,530</td>
<td>29.4</td>
<td>120</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>21,100</td>
<td>99.4</td>
<td>720</td>
</tr>
</tbody>
</table>

 protection  27  45
 SEMI-PUBLIC (open spaces, schools, community centers) 3.6  6
 PRIVATE (dwellings, shops, factories, lots) 29.4  49
 TOTAL 60  100

LOCALITY CIRCULATION PATTERN

NETWORK EFFICIENCY

Network length (streets, walkways) = 336 m/ha
Areas served (total area)
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) the building group that generally produces each type.
Quality of information: Accurate

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

Network length (streets, walkways) = 331 m/ha
Areas served (total area)
LOCALITY SEGMENT: The selected area shows how the pedestrian street squares and the parking lots are generated by the zig-zag in the lots. It also shows how this artificial design complicates network construction and public circulation, wasting considerable area that could otherwise be used for dwellings. This layout forces a costly infrastructure, and the excessive uncontrolled public areas put an additional burden on the dwellers' resources.

Secondary streets are 13m wide; walkways are 8m wide.

BLOCK: The typical block is approximately 1.2 ha, and is composed of two different kinds of lots: one of 96 m² (6 by 16), and the other of 128 m² (8 by 16). The latter is subdivided into two of 64 m² (4 by 16) along walkways and secondary streets.

A walkway crosses the block connecting secondary streets with main avenues. The parking lots are located perpendicular to secondary streets. The block has different sidewalk widths according to the intended hierarchy of the street.

It is very important to notice that all house setbacks are arbitrarily designed, provoking an artificial variety that complicates house expansion, house construction, and the user's control over their land and their environment. However, despite this, modifications and changes have been surprising.

LOCALITY BLOCK LAND UTILIZATION DATA

| DENSITIES          | Total Number | Area Hectares | Density  \\
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>93</td>
<td>.77</td>
<td>120</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>93</td>
<td>.77</td>
<td>120</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>558</td>
<td>.77</td>
<td>720</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways)</td>
<td>.43</td>
<td>37</td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>.77</td>
<td>63</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.2</td>
<td>100</td>
</tr>
</tbody>
</table>

NETWORK EFFICIENCY

Network length (streets, walkways) = 318 m/ha

AVERAGE AREA, DIMENSIONS = 81, 4/16
POPULATION-INCOME: The population target of the Institute is mainly stable workers earning 1 to 2.5 times the minimum official wage which is US $1600 (1978). They generally work for big/medium scale commercial or industrial companies. For that reason they are considered financially stable enough for a long term commitment in buying high standard houses/services and facilities. The project is heavily subsidized. People earning the same amount of money, without the privilege of being an INFONAVIT member, could never obtain comparable houses/services/facilities in the housing city market. The income selection criteria is based upon the minimum official wage earnings plus an employer subscription of the employee to the Institute, conditions that are far beyond the majority of the population. Moreover, these types of projects are politically manipulated as official propaganda seeking support for government policies. They are also presented as demagogic examples to the workers in order to alleviate to some extent those social pressures concerning the housing market. However, the limited or null effect of these projects in the overall context of low-income housing is clear.

CASE STUDY SOURCES
Land use Pattern: (approximate) IBID
Circulation Pattern: (approximate) IBID
Segment Plan: (accurate) IBID
Block Plan: (accurate) IBID
Typical Dwelling: (accurate) IBID
Physical Data: (accurate) Field survey 1976-1977
PHYSICAL DATA

(related to dwelling and land)

DWELLING UNIT

type: House
area (sq m): 71

LAND/LOT
utilization: Private
area (sq m): 64

DWELLING
location: Periphery
type: Row/Grouped
number of floors: 2
utilization: Single
physical state: Good

DWELLING DEVELOPMENT
mode: Instant
developer: Public
builder: Large Contractor
construction type: Masonry
year of construction: 1975

MATERIALS
foundation: Stone
floors: Cement
walls: Brick
roof: Brick Vault

DWELLING FACILITIES
WC: 1
shower: 1
kitchen: 1
rooms: 4
other: Service Patio

SOCIO-ECONOMIC DATA

(related to user)

GENERAL: SOCIAL
user's ethnic origin: Eastern Guadalajara
place of birth: Jalisco
education level: Primary

NUMBER OF USERS
married: 2
single: -
children: 6
total: 8

MIGRATION PATTERN
number of moves: 3
rural - urban: 1967
urban - urban: 1972
urban - rural: 1975
why came to urban area: Employment

GENERAL: ECONOMIC
user's income group: Middle
employment: Retail Store Employee
distance to work: 15 Km
mode of travel: Public Transportation

COSTS
dwelling unit: $ 4,000
land - market value: $ 1,800

DWELLING UNIT PAYMENTS
financing: Public
rent/mortgage: $ 16 / Month
% income for rent/mortgage: 13 %

PHOTOGRAPHS:
LA TUZANIA: (top) A local street with parking lots on both sides.
(bottom left) Pedestrian access.
(bottom right) Dining-living room in a single family dwelling.
A public market invading the street in the speculative development of Polanco.

A popular weekly market (tianguis) in the old speculative development of San Juan Bosco area.

A court in a dwelling with a well and storage tanks in the Echeverria area.

A girl doing the laundry in the illegal development of Balcones del Cuatro.
This project is a preliminary design for the development of a residential community in the City of Guadalajara.

The project derives from an initiative by the state government that deals with the provision of a site and attendant services for the low-income through a new government agency.

A first preliminary design was already prepared by the Department of Urban Planning (Guadalajara, Winter 1977), but an evaluation presented by the author in January of 1978, showed severe design shortcomings. Based on this evaluation an alternative design was suggested.

The proposal developed here is a further maturation of the alternative design and represents a brief outline for the preparation of the final project.

The project incorporates several distinctive characteristics: "condominium" ownership is provided with variable lot sizes that offer more flexibility in the use of the layout, maximizing user's responsibility and minimizing government costs in implementation, maintenance and operation. In housing, dwellings are provided that can be progressively expanded, minimizing initial investment costs by the users and the government. Different levels of services are provided that are associated with the different housing options resulting in a positive mixture of incomes.
SITE DATA

LOCATION: The site lies in the municipalities of Guadalajara and Zapopan, approximately 8 km southwest from the city center and 3.5 km from an industrial zone.

APPROACHES/ACCESSSES: The main route of approach is Colon Avenue running north-south on the west side of the site which leads to the city center. A planned peripheric avenue, La Patria, will run parallel to the northern side of the site. Both avenues are expected to be vehicular dominant routes serving large sections of the city. Both provide linear access on the north and east sides of the site.

TRANSPORTATION: Buses are already serving the illegal subdivisions .5 km to the north, this service could easily be extended.

SIZE/SHAPE
Gross area/Usable area of the site: 117 hectares

TOPOGRAPHY/NATURAL FEATURES/SOIL: The site has no special features. The natural drainage of the site runs from south to north with an average slope of less than 5%. The soil is seasonal agriculture land with underlying strata of well-graded sand and gravelly sands. Bearing capacity of the well-graded sand is 1.5 kg/cm² which is adequate for both dwellings and utility networks.

BOUNDARIES: To the east and to the north Colon Avenue and future La Patria Avenue separate the site from adjacent rapidly growing illegal subdivisions. To the west government land "ejidos" limits the site. To the south is a new high-income residential area on the surrounding steep slopes. Very eroded slope areas limit the site from this high-income area towards the Colon Avenue.

LAND TENURE/LAND COST/INCOME PATTERN: All of the land is private property owned by the state government. Government land "ejidos" surrounds the site on three sides. These areas are rapidly being illegally settled by low-income people. To the south there is private property being developed for high-income people. Land is valued at US $ 1.80/m², compared to $ 80.00/m² in the inner ring. The site has no infrastructure.

INFRASTRUCTURE/COMMUNITY FACILITIES: A high tension line runs along Colon Avenue and will provide service to the site. Water will be provided from a projected system that will also serve several communities around the site. Main sewage and storm drainage network will be extended 2 km south from the Lomas de Polanco speculative development. There are no existing community facilities and all will have to be provided within the project.

OTHER FACTORS:
Views: The site has a good view of the city.
Dust/odors/dirt/disturbances: The industrial zone when saturated might represent a long-term problem with dust, odors and smoke. Especially during the rainy season when the wind blows mostly east-west. Noise from the Colon and La Patria Avenues may become a nuisance.
BASIC DATA

AREA OF THE SITE: 117 hectares
AREA USED FOR HOUSING: 73 hectares
AREA FOR FUTURE COMMERCIAL/INDUSTRIAL USE: 28 hectares
AREA DONATED FOR MAIN CITY ARTERIES: 16 hectares
SITE CONDITIONS: Normal
APPROXIMATE POPULATION: 25,000
TARGET INCOME GROUP: From very-low to middle income yearly incomes range from US $ 400.00 to $ 3,000.00
NUMBER OF DWELLING UNITS/LOTS: 4,180
APPROXIMATE DENSITY: 731 persons per hectare
DEVELOPMENT: Progressive/instant
LEVEL OF SERVICES: Minimum progressive/standard
SUPPORTING COMMUNITY FACILITIES: 4, 18-classroom primary schools; 1, 12-classroom secondary school; 1 locality center with public market, post office, police, civic center, auditorium, movie theater; 1 day care nursery/clinic/kindergarten; space for one church.

COST DATA

<table>
<thead>
<tr>
<th>DWELLING OPTIONS</th>
<th>Nº of units</th>
<th>Cost per unit</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5x15 progressive</td>
<td>1,633</td>
<td>337.50</td>
<td>551,137.50</td>
</tr>
<tr>
<td>services lots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.5x15 standard</td>
<td>803</td>
<td>877.50</td>
<td>704,632.50</td>
</tr>
<tr>
<td>services lots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6x18 standard</td>
<td>832</td>
<td>1,400.00</td>
<td>1,164,800.00</td>
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<td>services lots</td>
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<tr>
<td>Expandable apartment</td>
<td>300</td>
<td>3,400.00</td>
<td>1,020,000.00</td>
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<td>type A</td>
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<td>Expandable apartment</td>
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<td>4,450.00</td>
<td>516,200.00</td>
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<td>type B</td>
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<td>7.5x24 commercial</td>
<td>254</td>
<td>4,680.00</td>
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<tr>
<td>lots</td>
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<tr>
<td>4.5x18 expandable</td>
<td>104</td>
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<tr>
<td>6x18 expandable</td>
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<td>house</td>
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<tr>
<td>Lots on corners</td>
<td>54</td>
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<td></td>
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<tr>
<td>Arcade corner houses</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access stairs</td>
<td>104</td>
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<td>Community facilities</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUB TOTAL</td>
<td></td>
<td></td>
<td>6,200,530.00</td>
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<td>87,360.00</td>
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<td>1,661,252.50</td>
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<tr>
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<td></td>
<td>2,300,000.00</td>
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<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>10,606,262.50</td>
</tr>
</tbody>
</table>

Note: The total cost per hectare of public housing projects recently built in the city is - as compared to this project - two times greater.

All cost are in US Dollars
1 Dollar = 22.60 Mexican Pesos
AERIAL SITE PHOTOGRAPH

KEY

- MAIN EXISTING CIRCULATION
- PROJECTED CIRCULATION

AERIAL PHOTOGRAPH: SOUTHWESTERN METROPOLITAN AREA. Note the main city arteries, projected arteries and the relation of the site with the circulation network.

The photograph was taken in 1970 by CETENAL. Today the north, east, and west borders of the site have been illegally occupied by low income settlers. Towards the southern fringe of the site a high income development is under construction.

PROPOSED PROJECT (55)
PLANNING POLICIES/GOALS

The proposed planning policies/goals are as follows:

PRIMARY USE: RESIDENTIAL

The primary use of the site will be residential. However land will be reserved for future anticipated commercial/industrial demand, especially along the main circulation arteries. The profits generated on this land will be used to finance the last stages of the project. Community facilities will be built incrementally according to the pace of development.

TARGET INCOME GROUPS: FROM VERY LOW TO MIDDLE INCOME

The development will aim toward the following income groups:

<table>
<thead>
<tr>
<th>Group</th>
<th>% of Pop.</th>
<th>Year.Inc.</th>
<th>25% hous.</th>
<th>Monthly P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very-low</td>
<td>12</td>
<td>$400.00</td>
<td>$100.00</td>
<td>$8.30</td>
</tr>
<tr>
<td>Low</td>
<td>16</td>
<td>$850.00</td>
<td>$212.00</td>
<td>$17.70</td>
</tr>
<tr>
<td>Mod-low</td>
<td>22</td>
<td>$1,600.00</td>
<td>$400.00</td>
<td>$35.00</td>
</tr>
<tr>
<td>Low-mid.</td>
<td>12</td>
<td>$2,500.00</td>
<td>$625.00</td>
<td>$52.00</td>
</tr>
<tr>
<td>Middle</td>
<td>13</td>
<td>$3,000.00</td>
<td>$750.00</td>
<td>$63.00</td>
</tr>
</tbody>
</table>

The range of incomes goes from 1/4 to 2 times the minimum official wage that in 1978 was $1,600.00 per year.

FINANCING: PUBLIC/PRIVATE/POPULAR

Public funds will be used to buy the land and prepare the project. Private funds will finance the initial stage of construction. The project will be promoted and sold before completion. With this income the project will be completed.

UTILITIES/CONNECTIONS TO EXISTING SYSTEMS:

Water will be connected to the planned system of Nueva Espana. Sewer network will be connected to the main collector that runs along Colon Avenue. Electricity will be connected to the high tension line that parallels the eastern side of the site. Main lines will be installed instantly; secondary lines for progressively developed lots will be provided when requested by the users.

SERVICES:

Public transport will be provided initially from and to Colon Avenue. All other services will be provided according to the standard procedures in the city.

DEVELOPMENT MODE: PROGRESSIVE/INSTANT

40% of the lots will not have full services at the beginning. Dwelling units will be progressively expanded. 85% of the dwelling units, including the 40% above, will be built by self-help/aided self-help with limited technical assistance from the government.

INTENSITY OF LAND USE: HIGH DENSITIES

Similar densities to public housing and private speculative developments presently found in the city, approximately 700 persons/hectare, net density.
PROPOSED PROJECT

KEY

- Public: streets
- Semi-public: open spaces, schools, community centers
- Private: dwellings, shops, factories, lots
- Semi-private: cluster courts
- Perimetal speculative land

LC: LOCALITY CENTER
S: School
Ch: Church
R: Recreation
H: Health
PO: Post Office
SS: Social Services
M: Market
P: Parking
P: Police

LAND UTILIZATION DATA

DENSITIES

<table>
<thead>
<tr>
<th></th>
<th>Total Number</th>
<th>Hectares</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>3963</td>
<td>121</td>
<td>115</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>4180</td>
<td>121</td>
<td>121</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>25080</td>
<td>121</td>
<td>731</td>
</tr>
</tbody>
</table>

AREAS

<table>
<thead>
<tr>
<th></th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways, open spaces)</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>SEMI-PUBLIC (open spaces, schools, community centers)</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>12</td>
<td>47</td>
</tr>
<tr>
<td>SEMI-PRIVATE (cluster courts)</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>SUB TOTAL</td>
<td>73</td>
<td>100</td>
</tr>
</tbody>
</table>

TOTAL LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th></th>
<th>Hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB TOTAL</td>
<td>73 Hects.</td>
</tr>
<tr>
<td>PERIMETRAL SPECULATIVE LAND</td>
<td>28 Hects.</td>
</tr>
<tr>
<td>PERIMETRAL AVENUES</td>
<td>16 Hects.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>117 Hects.</td>
</tr>
</tbody>
</table>

DWELLING/LOT TYPES

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1633</td>
<td>39</td>
</tr>
<tr>
<td>2</td>
<td>803</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>832</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>300</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>116</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>254</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>104</td>
<td>2.5</td>
</tr>
<tr>
<td>8</td>
<td>72</td>
<td>1.5</td>
</tr>
<tr>
<td>Arcade corners house</td>
<td>12</td>
<td>.5</td>
</tr>
<tr>
<td>Big lots on street corners</td>
<td>54</td>
<td>1.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4180</td>
<td>100</td>
</tr>
</tbody>
</table>

PLAN OF LAND USE/SUBDIVISION
LAND SUBDIVISION

The proposed project contemplates the following policies for land subdivision:

Minimization of public land for circulation, to reduce length of public infrastructure, (water, electricity, sewerage, storm drainage, street lights), in order to reduce construction costs, simplify maintenance and concentrate services, (police, garbage collection, transportation, etc.).

It intends to maximize user control, responsibility, initiative and participation, in order to achieve sound social benefits that can not be economically quantified.

Application of these policies are as follows:

As to the layout, the design follows two basic principles that regulate public circulation, and the size of the neighbourhood.
The block is small enough to facilitate circulation but still large enough to minimize public areas.
The neighbourhood is small enough to facilitate pedestrian circulation for daily movements, and large enough to allow at least one primary school.

As to the block, condominium ownership is proposed.
This system of direct ownership of a single unit in a multi-unit structure, increases the flexibility of the layout, permits the progressive development of the project, encourages the control, responsibility, initiative and participation of the users.

The same patterns of development can be found in old settlements everywhere in the country; they provide an adequate environment for the further consolidation of the community.
**PROPOSED PROJECT CIRCULATION**

<table>
<thead>
<tr>
<th>STREET TYPE</th>
<th>LENGTH</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>485m</td>
<td>4</td>
</tr>
<tr>
<td>III</td>
<td>1695m</td>
<td>12</td>
</tr>
<tr>
<td>II</td>
<td>5790m</td>
<td>40</td>
</tr>
<tr>
<td>I</td>
<td>6330m</td>
<td>44</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>14300m</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**STREETS TYPE IV:** Major arterial, vehicles dominate strongly over pedestrians. Through traffic for all kind of vehicles. Stricter controls are established for the protection of pedestrians, rails, traffic lights, overpasses. Provide access to the locality, determines major transportation routes. Service streets are used for secondary transportation routes. It may be in the future a limited access thruway.

**STREETS TYPE III:** Vehicle dominate. Local and through traffic for all kind of vehicles and pedestrians. Controls are established for protection of pedestrians: Crosswalks traffic lights, rails, overpasses and underpasses. May delineate the neighborhood.

**STREETS TYPE II:** Vehicles and pedestrians. Vehicles dominate but do not control circulation. Local traffic and limited through traffic for vehicles and pedestrians. Control of traffic frequency. Give access to commercial areas, and locality center. Locality transportation route.

**STREETS TYPE I:** Pedestrians dominate over vehicles. Character and speed are controlled by the street layout. Give access to residential property.

**PROJECT NETWORK EFFICIENCY**

Network length (streets) \(14300m = 122m/Ha\)

Areas served (total area) \(117Ha\)
HOUSING

The dwelling options proposed for the project are intended to minimize initial investment for the government and the user, providing minimum conditions for immediate occupation and encouraging further upgrading/expansion of the lots/dwellings.

There are three basic options: Progressive services lots, standard services lots, and expandable dwelling units. A reduced number of commercial facilities are also provided.

The progressive services lots are located in clusters type A; electricity, communal water tap, and a cesspool for each lot, are provided.

The standard services lots are located in clusters type B; full individual connections are provided.

The expandable dwelling units, both apartments and houses, are basic shells which can be internally completed and expanded. They are located on prime, higher value, areas.

Commercial facilities which can alternate as dwellings or shops are provided on ground floor of the buildings.

URBAN SEGMENTS/CLUSTERS/BLOCKS

The urban segments (neighbourhood), are approximately 400m x 400 m; the project contains four, grouped around the locality center. These urban segments have sufficient semi-public areas which include one primary school, diverse social services, and large recreation area that can accommodate a soccer field and additional sport facilities. Every urban segment can house around 8,000 people.

These urban units offer three types of clusters with condominium ownership:

1. Cluster type A: Bordered by one street, contains progressive services lots.

2. Cluster type C: Bordered by two streets contains standard services lots.

3. Cluster type C: Surrounds the locality center, contains expandable houses and apartments.

Commercial shells are provided on the ground floor of the apartment buildings where an arcade will encourage commercial activities.

Privately owned commercial lots are available along the two main local streets.

Block data is shown to the right of the plan.
LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Total Area</th>
<th>Area Hectares</th>
<th>Density N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways, open spaces)</td>
<td>1.97</td>
<td>1.97</td>
<td>125</td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>1.97</td>
<td>1.97</td>
<td>752</td>
</tr>
<tr>
<td>SEMI-PRIVATE (cluster courts)</td>
<td>1.97</td>
<td>0.70</td>
<td>21</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3.2</td>
<td>3.53</td>
<td>100</td>
</tr>
</tbody>
</table>

* Lots with double access might be easily turned into two dwelling units.

LAND UTILIZATION DIAGRAMS
DWELLING OPTIONS

The following two pages illustrate the different dwelling options available in terms of types, level of services, areas, and costs. It also shows the suggested distribution of the dwelling options among different income groups. Two financial possibilities, 5 year and 10 year, at 6% annual interest, with a 15% down payment are considered.

Costs are estimated on actual market values.

<table>
<thead>
<tr>
<th>KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOT/BUILT AREA</td>
</tr>
<tr>
<td>SERVICES/CIRCULATION</td>
</tr>
<tr>
<td>ACCESS</td>
</tr>
<tr>
<td>EXPANSION</td>
</tr>
<tr>
<td>SLAB EXPANSION</td>
</tr>
<tr>
<td>ROOM</td>
</tr>
<tr>
<td>KITCHEN AREA</td>
</tr>
<tr>
<td>TOILET/BATHROOM AREA</td>
</tr>
<tr>
<td>INTERIOR STAIRS</td>
</tr>
<tr>
<td>BALCONY</td>
</tr>
<tr>
<td>COURT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TYPE</th>
<th>LOT/BUILT AREA</th>
<th>LEVEL OF SERVICES</th>
<th>LOT AREA</th>
<th>INSTANTLY BUILT AREA</th>
<th>LAND/SERVICES COST</th>
<th>CONSTRUCTION COST</th>
<th>UNIT TOTAL COST</th>
<th>15% DOWN PAYMENT</th>
<th>5 YEAR LOAN</th>
<th>10 YEAR LOAN</th>
<th>INCOME LEVEL</th>
<th>% OF UNITS IN THE PROJECT</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5x13 Lot + cesspool</td>
<td>67.5m²</td>
<td>Electricity, communal water</td>
<td>$ 5.00/m²</td>
<td>-</td>
<td>$ 13.00/m²</td>
<td>$ 877.50</td>
<td>$ 132.00</td>
<td>$ 50.00</td>
<td>$ 5.50</td>
<td>$ 3.20</td>
<td>Very low</td>
<td>39</td>
<td>Cluster A</td>
</tr>
<tr>
<td>4.5x13 Lot</td>
<td>67.5m²</td>
<td>Electrical, communal water</td>
<td>-</td>
<td>-</td>
<td>$ 13.00/m²</td>
<td>$ 877.50</td>
<td>$ 132.00</td>
<td>$ 50.00</td>
<td>$ 5.50</td>
<td>$ 3.20</td>
<td>Very low to low income</td>
<td>19</td>
<td>Cluster B</td>
</tr>
<tr>
<td>6x18 Lot</td>
<td>108m²</td>
<td>Electrical, communal water</td>
<td>-</td>
<td>-</td>
<td>$ 13.00/m²</td>
<td>$ 1404.00</td>
<td>$ 210.00</td>
<td>$ 510.00</td>
<td>$ 3400.00</td>
<td>$ 23.00</td>
<td>Low income</td>
<td>20</td>
<td>Cluster B, along peripheric street</td>
</tr>
</tbody>
</table>

Expandable Apartment A 4.5x13.5
Standard
20m²
$ 13.00/m²
$ 260.00
$ 3400.00

Expandable Apartment B 4.5x13.5
Standard
20m²
$ 13.00/m²
$ 4450.00

Location
Low-income
7
Cluster C
PROPOSED PROJECT

FIRST FLOOR

SECOND FLOOR

TYPICAL BUILDING SECTION

7.5x24 Commercial Lot
Standard
180m²
$ 26.00/m²
$ 4680.00
$ 702.00
$ 77.00
$ 44.00
Lower-middle income
6
Along main access avenues

4.5x18 Expandable House
Standard
81m²
76m²
$ 11.00/m²
$ 55.00/m²
$ 5250.00
$ 785.00
$ 86.00
$ 50.00
Middle income
2.5
Cluster C

6x18 Expandable House
Standard
108m²
103m²
$ 13.00/m²
$ 55.00/m²
$ 7070.00
$ 1060.00
$ 116.00
$ 67.00
Middle-high income
1.5
In front of semipublic areas
COMPARISON

The chart on these two pages draws a comparison of segments, blocks, land utilization percentages, circulation lengths, and densities, among the four case studies and the proposed project.

The chart graphically shows the primary physical indicators of every settlement.

It is intended to evaluate/compare existing situations with the proposed project.

LAND UTILIZATION SUMMARY

<table>
<thead>
<tr>
<th>LOCALITIES</th>
<th>DATE</th>
<th>HOUSE TYPES</th>
<th>INCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCALITY SEGMENT 400X400 MTS. 16 HECTARES</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LOCALITY: Eight representative localities were selected in order to present a general cross section of urban/dwelling environments with their evolution in Guadalajara.

LOCALITY SEGMENT: For purposes of comparison, a typical segment of 400m by 400m is taken from each locality. The segment shows the subdivision pattern and the circulation layout.

LOCALITY BLOCK LAND UTILIZATION DATA

LOCALITY BLOCK: Within each locality segment, a typical residential block is selected, with the aim of determining land utilization, circulation length and densities in relation to number of lots, dwellings and people.

NUMBER OF LOTS
AVERAGE LOT AREA
DWELLING UNITS
DWELLING UNITS/Ha (gross)

LAND UTILIZATION DIAGRAMS 1 HECTARE

LAND UTILIZATION PERCENTAGES: Proportions of public land and private areas are compared. Their ratio determines the users control, maintenance responsibility, and functional efficiency of a layout; i.e., a high percentage of public land results in high direct costs of installation and maintenance for the city's administration, as well as high indirect costs due to inefficient use of the land.

% OF PRIVATE LAND
% OF PUBLIC LAND

NETWORK EFFICIENCY 400X400 MTS. 16 HECTARES

CIRCULATION LENGTHS: A relation between public circulation length and area served indicates the network efficiency; a high ratio means a less efficient network in terms of direct costs and maintenance costs.

Mts/Ha

NET DENSITY 1 HECTARE

- 20 PERSONS

DENSITIES: The number of persons per hectare relates to both the number of lots and the type of dwellings per hectare. This determines the intensity of land use; low densities mean higher development costs per person.

PERSONS/Ha
1 SAN JUAN DE DIOS
1920
Tenements, Old traditional
Very low, low

2 COL. ECHEVERRIA
1970
New illegal subdivision
low

3 SANTA CECILIA
1960-70
Private speculative
Mod. low, low

4 LA TUZANIA
1970
Public housing
Mod. low, middle

PROPOSED PROJECT
1978
Proposed
From very low to middle income
APPENDIX

Additional information is presented in this section of the work:

Appendix I illustrates the typical dwelling units found in the city according to the housing systems classification outlined on the introduction. It complements the physical data matrix of page 11.

Appendix II provides background information about Mexico it covers the following: People, geography, history, economy and government.

PHOTOGRAPHS, OPPOSITE PAGE:
A TENEMENT COURT. (Col. La Esperanza)
APPENDIX I

DWELLING TYPES

Guadalajara, Mexico

The dwelling types cover the range of income levels from very low to middle-high income. They represent past and present trends of evolution in the housing market. This chart provides a reference guide to compare dwelling types in relation with incomes, lot areas, dwelling areas, construction time, and existing percentage of dwelling units in the city. The dwelling types are arranged vertically according to their income levels.

KEY
- KITCHEN
- TOILET/BATHROOM
- PIT LAVATORY
- WELL
- LAUNDRY AREA

TENEMENTS VECINDADES

TENEMENTS: The origins of this type can be traced back to the 14th century. There are three types: In the city center, (these are rapidly disappearing due to increasing commercial pressure). In the inner ring, old houses transformed into tenements which are being renovated and maintained through different municipal policies. And the new “apartment type” tenement, (minimum dwelling unit allowed by the current municipal codes), tends to proliferate in the periphery.

1. TENEMENTS: VECINDADES

ILLEGAL SUBDIVISION

ILLEGAL SUBDIVISION: Since 1970 the growth trend of the city, and the availability of government land (ejidos) around the city, have brought this type to account for an increasing share of the city's housing stock. It is generally found in new illegal subdivisions on former agricultural parcels. Few old settlements with similar types in terms of physical dwelling characteristics can be found around the city, especially in the farms that did not follow the urban layout regulations nor the old construction codes, and today are well consolidated localities.

4. LA PIRAMIDE

Very low income
70 m²
28 m²
1975
4%

5. DOMINGO SAVIO

Low income
176 m²
21 m²
1975
23%

6. COLONIA ECHEVERRIA

Low income
250 m²
24 m²
1970
64%

7. TETLAK

Low income
360 m²
70 m²
1960
46%
APPENDIX I: DWELLING TYPES

PRIVATE SPECULATIVE

PRIVATE SPECULATIVE: The development of private speculative projects started in the 1940s. The dimensions and areas of the lots have been systematically reduced since then. There are two generations of types which can be distinguished: The old ones where the regular subdivision of the old traditional blocks resulted in deep lots, and the new ones with a depth based on the minimum area required by law, and that in most cases was further subdivided. Rising costs of urbanization have made these developments too expensive for the low-income.

PUBLIC HOUSING

PUBLIC HOUSING: These kind of projects were introduced in the mid 1960s. They are typical examples of government policies in housing design. They are the only ones in this chart, designed by professionals: Architects/engineers, with the result that the designs are in clear contrast to all of the other dwelling types. The dwellings are generally subsidized, poorly designed, and badly constructed. User's needs are seldom met. The types represent images of "burgoi" aspirations that deformates reality penalizing the people in terms of maintenance, use, and location.

OLD TRADITIONAL

OLD TRADITIONAL: The origins of this type can be traced back to the 16th century, when the model was imported from Southern Spain. It evolved up until the 1940s conserving the essential parts of the house: Entrance (zaguan), corridor and court. The last types were developed on very deep lots with reduced widths, but the general simple principle was maintained. This type tends to disappear especially in those areas of rapid commercial growth.
APPENDIX II
NATIONAL CONTEXT

Mexico

PEOPLE
Population: 65,000,000
Ur. Population: 60%
Rur. Population: 40%
Population Growth: 3.5% per annum
Population Density: 32 inhabitants/ sq. km.
Ethnic Groups: Indian, Spanish, Mestizo 65%
American Indians 30%
Caucasian/minorities 10%
Religion: Roman Catholic 97%
Language: Spanish 98%
Literacy: 65%
Life Expectancy: 61 yrs.
* 1977 estimated

GOVERNMENT
Type: Federal Republic
Republic established: 1822
Constitution: 1917
Branches: Executive-President, Chief of state
head of government.
Legislative-Bicameral
Judicial-Supreme court, local and federal system.

Political parties:
Institutional Revolutionary Party (PRI)
National Action Party (PAN)
Popular Socialist Party (PSP)
Authentic Party of the Revolution (PARM)
Mexican Communist Party (PCM)
Mexican Workers Party (PMT)

Sufrage: Universal over 18
Political subdivisions: 31 States and the Federal Districts.

HISTORY
Olmec and Teotihuacan cultures presumably reached their peak several centuries before
Christ. 320 to 925 (A.D.) Classic mayan period surpassed all other pre-Colombian civilizations.
600 (A.D.) Toltecs entered the valley of Mexico developing an original culture.
1100: Chichimecas conquered this valley and adopted Toltec's civilization.
1200: Aztecs subjugated the region and extended their rule until the arrival of the Spaniards.
1325: Hernan Cortes conquered Tenochtitlan.
1519 to 1810: Spaniards extended the limits of the colony.
1810 to 1822: War of Independence.
1835: Texas proclaimed independence.
1846: Mexico-US War; the latter annexed more than half the territory of the country.
1865: Benito Juarez's reforms confiscated all church properties lessening its power.
1865: Mexico-French war finalized with the victory over the imposed Hapsburg emperor.
1876 to 1913: Porfirio Dia's dictatorship.
1910: Mexican Revolution; all economic and social problems of the last period erupted in this popular movement that culminated with the Constitution of 1917.
From 1917: the Revolutionary Party, under various names and after a number of reorganizations, continues to be the most important political force in the nation.

ECONOMY
Gross National Product (GNP): US $ 50 billion
GNP per capita: US $ 910.
GNP per capita growth rate: 2.84%
Currency: Mexican Peso (22.60 = US $ 1.)

AGRICULTURE
Land: Cropland 124, pasture 40%; labor 40%
Products: Corn, cotton, wheat, coffee, sugar-cane.

INDUSTRY
Labor: 34%
Products: Food processing, chemicals, basic metal, metal products, petroleum products.

NATURAL RESOURCES
Petroleum, silver, copper, gold, lead, zinc, natural gas, timber.

TRADE
Partners: US, 60%, European communities (EC), Japan.

1. PEOPLE. Mexico is the most populous Spanish-speaking country in the world. With a high birthrate and with progressively increasing longevity resulting from improved living conditions, each decade of the twentieth century has seen a rise in the population growth rate; in 1970s it was among the highest in the world. This rate of growth has placed increasing pressure on the limited amount of arable land. At the same time, an expanding educational system, improved communications, and the growth of industry have tended to draw young people away from the farms and into the cities and towns.

The proportion of agriculture workers has declined sharply since 1960. Industry registered a substantial gain, but it was in the service sector that the largest gain was recorded as migrants from the countryside took marginal jobs in small shops, as street vendors, or as domestic servants.

More than half of the people live in central Mexico, but large internal population shifts have occurred since 1950. Initially the shift from the underdeveloped southeastern states and the central plateau was to the urban centers, Mexico City, Monterrey and Guadalajara, but recently migration shifted to the border areas of the northern states.
2. GEOGRAPHY. Mexico is third in size among the countries of Latin America (after Brazil and Argentina). Extending south from its border with the United States, Mexico is in the shape of a narrowing cone, broken in the northwest by the long narrow peninsula of Baja California and in the extreme southeast by the blunt peninsula of Yucatan.

Two mountain ranges extend roughly parallel to the coastal lowlands, and between them lies a very large interior plateau. The plateau narrows to the south and terminates in a transverse mountain range consisting of a series of volcanoes, some of which are still active. This highland region of volcanic cones is the heartland of Mexico, most of the large cities and the densest rural population are located in its basin and valleys. Climate is generally more related to altitude than to latitude. Most of the country is dry; only 12% of the total area receives rainfall in all seasons, however arable land is subject to irregular rainfall, floods and droughts.

3. HISTORY. Before the Spaniards arrived, much of what is present-day southern Mexico as well as part of contemporary Guatemala and Belize, were occupied by different cultures in distinct periods of time, some of them only left testimonies of their greatest civilizations, such as the Olmecs and the Teotihuacans. During six centuries (A.D. 325 to 925) the classic Mayan period surpassed all other pre-Columbian civilizations.

About the tenth century the Chichimecos conquered the valley of Mexico and adopted the Toltec culture. Probably in the twelfth century the Aztecs came and extended their rule until the arrival of the Spaniards.

When Hernan Cortes, aided by Indian enemies of the Aztecs, conquered Tenochtitlan, he encountered an advanced civilization. In their zeal to introduce Roman-Catholicism, the Spaniards destroyed many symbols of the Indian civilization, notably magnificent temples and well planned cities. They also tried to extend the limits of the country far beyond the pre-Columbian settlements and ruled for 300 years. The colony was based on the exploitation of Indian labor and the extraction of natural resources, mainly precious metals.

By the end of the colonial period, the wealth of the colony made it by far the prize possession of the Spanish crown but the "criollo" elite (Mexican born Spanish) resented the fact that they were socially, politically, and economically subordinated to Spain. Despite later reforms of the monarchy and with the adoption of democratic ideas the colony rebelled in 1810 and declared Independence in 1822.

From this date up until 1876 the new country was in a continuous state of war and under several types of regimes, the more important events were:

- In 1835 independence of Texas; in 1845 the Mexican-American war was annexed more than half the territory of the country; in 1858 the reforms of Juarez which confiscated all church properties, appreciated lowered the power and hierarchy of the church in national affairs; in 1864 Napoleon imitated a Hapsburg emperor, who finally was defeated in 1867; from 1870 to 1910 Porfirio Diaz' dictatorship was turned over with the subsequent revolution of 1910. All the social and economic progress of this period of development erupted in this popular movement, that ended with the Mexican Constitution of 1917.

Since that time the Revolutionary Party, under various names and after a number of renegotiations continues to be the most important political force in the nation.

4. ECONOMY. Mexico, at the end of 1974 was completing twenty-five years of rapid economic growth, but the government was confronted with problems of inflation and uneven distribution of wealth. Agriculture has contributed an ever-decreasing share to the GNP and has represented only 10% since 1950. After more than thirty years of agrarian reform there were more than 2.6 million farming units that employed 4.2% of the labor force, but half of all the agricultural production came from 4% of the farms. The vast majority were subsistence farms or produced only for nearby markets with an efficient methods.

Mexico is self-sufficient in many products, although some years imports of crops are required when the harvest is poor. Mexico ranks among the major beef producing and exporting nations.

Industrial production includes most consumer goods, and many intermediate and capital goods. Industry employs 18% of the labor force and represents 29% of the GNP in 1973. 80% of all manufactured products sold in the country are locally produced. Most of the industry has grown from high protective import barriers. 57% of all manufacturing enterprises are concentrated in clothes and food-processing. The government follows a policy of maintaining a mixed economy and plays an active role. The government is an investor, a provider of substantial credit, and an entrepreneur. It has a dominant role in certain sectors: petroleum, railroads, electricity, communications, irrigation, steel manufacturing, aviation, and petrochemicals. It plays an expansive role in finance and operates the largest marketing and retailing organization. Indeed it acts to influence the level and direction of private investment by such means as concessions for the exploitation of minerals, exclusion of imports competing with domestic products and the granting of fiscal and tax incentives and benefits.

Since 1940, imports have far exceeded exports, resulting in an unfavorable balance of trade but not in amounts sufficient to cause overall balance-of-payments difficulties.

Although the gap between imports and exports is a continual threat, the trade deficit is almost covered by receipts from tourism and remitting capital. By 1973 United States had provided nearly 80% of total foreign investment in the Federal Republic of Germany, the United Kingdom, France, and Japan, in that order accounted for the rest.

Although Mexico is a relatively wealthy country, it has not been able to eliminate poverty or to improve income distribution, especially between the rural and urban inhabitants. In addition inflation has become sufficiently high to cause concern and to stimulate discontent in the labor force. Inflationary pressure first became evident in 1968. By 1973 the national retail price index had risen by more than 20% over 1972, in part the result of heavy borrowing by the government and the western recession. This precipitated an economic crisis that led to the devaluation of the peso in 1976.

The unemployment rate is estimated at 16% of the working population. This figure and the consequences in the economy would be far greater and severe if not for the massive social security provided by the illegal movement of "wet-backs" into the United States.

5. GOVERNMENT. During the first half century of independence, Mexico experimented with or was subject to, at least forty forms of government, including federal and centralized organization, constitutional monarchy, dictatorship, and representative democratic government.

The Constitution sets forth a tricameral division of power among executive, legislative, and judicial branches. The powers of the executive invested in a president far exceed those of the other branches, and the federal government assumes extensive rights to intervene in the states. The formula for continuity and relative stability in government that has evolved since the revolution is replete with seeming contradictions: A very strong president who is barred from reelection; a weak national Congress in which token representation of the opposition is guaranteed; elected state governors with considerable local autonomy but only as long as they remain unquestionably loyal to the president; monopolization of political activities by a single party but one that is broadly based; and universal suffrage but little choice for the voters. With the vast apparatus of the state behind it, the Institutional Revolutionary Party, (Partido Revolucionario Institucional; PRI) has been invincible at the polls since its inception in 1919 as the government party. Thus, it has generally been able to determine how much and what kind of opposition it will encourage or tolerate.

The Mexican political system, since the consolidation of the revolution in 1920s and 1930s, has been considered one of the most unusual of the world. For several decades it was generally viewed as a stable democracy dominated by a single party. By the 1970s however, in light of the stern repression of students demonstrations in 1968, many observers had concluded that the persistence of the revolutionary ethos has served to camouflage a generally benign, in many respects enlightened, but increasingly "bourgeois" and decidedly authoritarian system.
STUDIES

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

BACKFILL. Earth or other material used to replace construction, such as culvert, sewer, and pipeline trenches and behind embankment structures; may include: old structure and a new lining. (Oepnings, 1972)

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

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

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

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

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

BUILDING DRAIN. Lowest horizontal piping of the building drainage discharge, soil, water, and other drainage pipes. It is connected to the building sewer. (MCT V 45-7, 1953)

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

POOL. A underground catch basin that is used to collect liquid waste is drained to permit settlement of the liquid into the surrounding soil. (Merriam-Webster, 1971)

CIRCULATION. System(s) of movement/ passage of people, goods, information, or vehicles: streets, walkways, parking areas. (U.S.D.P.)

CLAY. A lusterless colloidal substance, plastic when moist, that contains clay minerals (grains less than 0.002mm in diameter). (Merriam-Webster, 1971)

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

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

COLLECTION SYSTEM. The system of pipes in a sewer system that transports domestic and industrial sewage, collection lines, manholes, laterals, mains. (U.S.D.P.)

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

COMMUNITY FACILITIES/SERVICES. Facilities/services used in common by groups of dwellings or sections of a development. (U.S.D.P.)

COMMUNITY MORTALITY. Facilities for activities voluntarily undertaken for pleasure, fun, relaxation, exercise, etc. (U.S.D.P.)

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

CONDOMINIUM. A system of direct ownership of a single space or structure. The individual owns the unit in the same manner as if it were a single family dwelling. (U.S.D.P.)

CONSTRUCTION. Materials which allow current to flow such as aluminum, copper, iron. (MCT V 45-7, 1953)

CONCRETE. A transitional layer of bituminous coating of or containing bitumin; as asphalt or tar. (Dipewiba, 1972)

CONURBATION. Area consisting of one or more Dwelling units, people or families per unit hectare. Gross density is the number of dwellings, dwellers, or units per unit hectare; net density is the number of dwellings, or units per unit hectare. (Merriam-Webster, 1971)

CONTRACTOR. Four groups are considered: SELF-HELP BUILD; where the dwelling unit is directly built by the user or occupant; in which the dwelling unit is totally or partially built by a skillful or professional person hired by the user or occupant. (Dipewiba, 1972)

CURRENT. An electric current that flows continuously in one direction. (MCT V 45-7, 1953)

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

DISTANT. The degree or amount of separation between two points. (U.S.D.P.)

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

DRAINAGE. The arrangement of elements that make up the building, which help to judge. (Merriam-Webster, 1971)

DRAINAGE SYSTEM. An underground network of conduits, or pipes, that convey liquid waste from its point of generation to a treatment or disposal facility. (U.S.D.P.)

DRAINAGE. The degree or amount of separation between two points. (U.S.D.P.)

DST/ST. Daylight saving time, the time of standard time (MCT V 45-7, 1953)

DRAINAGE. The arrangement of elements that make up the building, which help to judge. (Merriam-Webster, 1971)

SWELLING. The general, global designation of a building or structure that when people live. A dwelling contains one or more rooms, or units, people or families per unit hectare. Gross density is the number of dwellings, or units per unit hectare; net density is the number of dwellings, or units per unit hectare. (Merriam-Webster, 1971)

Dwelling Builder. Four groups are considered: SELF-HELP BUILD; where the dwelling unit is directly built by the user or occupant; in which the dwelling unit is totally or partially built by a skillful or professional person hired by the user or occupant. (Dipewiba, 1972)

Dwelling Builder. Four groups are considered: SELF-HELP BUILD; where the dwelling unit is directly built by the user or occupant; in which the dwelling unit is totally or partially built by a skillful or professional person hired by the user or occupant. (Dipewiba, 1972)

ABSORPTION. Absorption (amp) is a measure of the rate of flow of electricity. It is somewhat comparable to the rate of flow of water (quantity). (MCT V 45-7, 1953)

Amperes. Amperes (amp) are a measure of the rate of flow of electricity. It is somewhat comparable to the rate of flow of water (quantity). (MCT V 45-7, 1953)

Anemometer. A device used to measure wind velocity. A steady current produced by one volt applied across a resistance of one ohm. (MCT V 45-7, 1953)

Anemometer. A device used to measure wind velocity. A steady current produced by one volt applied across a resistance of one ohm. (MCT V 45-7, 1953)

ANEMOMETER. A device used to measure wind velocity. A steady current produced by one volt applied across a resistance of one ohm. (MCT V 45-7, 1953)

DESIGN. The process of selecting the means and controlling the elements, steps, and procedures for producing what will adequately satisfy some need. (Merriam-Webster, 1971)

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

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

DEVELOPMENT SITE. There are two general ranges of sizable development, each of which may be subdivided into smaller units (to include lots, service centers, etc.). (U.S.D.P.)

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A ream (as in paper) is a large bundle of paper, traditionally 500 sheets or 800 grams. Kilowatt (kw) is a unit of electrical power. A kilowatt hour (kwh) is a unit of energy equal to the power of a kilowatt used for one hour. A kilowatt-hour can also be thought of as the energy consumed by a 100-watt light bulb burning for 10 hours or a 500-watt appliance running for 2 hours. Kilowatt-hours are used to measure the amount of energy consumed by residential, commercial, and industrial customers on a daily, monthly, or annual basis.

**Urban Studies**

Urban studies is the interdisciplinary field concerned with the study of urban areas, which includes the analysis of their historical development, spatial organization, social structure, and economic activities. Urban studies draws on a range of theoretical and methodological approaches from sociology, geography, economics, politics, and anthropology, among others. Urban studies examines the ways in which cities are formed, how they change over time, and how they interact with their surrounding environments. The study of urban areas is crucial for understanding the complex social, economic, and environmental dynamics that shape urban life.

**Definitions**

**U.S.D.P.**

United States Department of Planning.

**LAYOUT EFFICIENCY**

A measure of the efficiency of a layout, often expressed as the ratio of the actual layout area to the theoretical minimum area. It is used to assess the compactness and efficiency of a design or plan.

**MILL POND**

A collection system component that forces sewage to a higher elevation to avoid deep underground pipelines. Mill ponds are commonly used in rural areas to provide a natural water source for irrigation or community use.

**LOCALITY**

A term used to describe a specific location or area, often used in a geographical context to refer to a particular region or community. Localities can be defined by political, administrative, or cultural boundaries.

**LOT PROPORTION**

The ratio of lot width to lot depth, a key factor in determining the suitability of land for various types of development.

**LAYOUT**

The arrangement or planning of a space or area, often used in the context of urban design or planning. It can refer to the overall design or specific elements within an urban environment.

**NEUTRAL WIRE**

A wire in an electrical system, often used as a return path for electrical energy. Neutral wires are not typically involved in the transfer of power; they are used to return power to the source after it has been used.

**NEIGHBORHOOD**

A term used to describe a community or area, often used in the context of urban planning. Neighborhoods are smaller than districts and are typically defined by a sense of shared identity and cultural or social cohesion.

**NEW BUILDING**

A term used to describe a structure that is newly constructed or built. New buildings are typically differentiated from older buildings based on construction methods, materials, and design.

**NICHOLAS HAYDEN**

A notable urban planner and theorist known for his work on urban design and planning. Hayden's ideas have been influential in shaping the modern field of urban studies.

**OCTAVE**

A unit of frequency equal to the ratio of a wave's wavelength in meters to its speed in meters per second. Octaves are used in the study of sound and music to describe frequency levels.

**OHMS**

The unit of electrical resistance, named after Georg Simon Ohm, a German physicist. Ohms are used to measure the resistance of electrical devices and circuits.

**PLAUTUS**

A Roman playwright known for his satirical and comic works. Plautus is considered one of the greatest classical playwrights.

**RACIAL SEGREGATION**

The separation of populations into racial groups, often occurring on a societal level. Racial segregation can manifest in various forms, including residential, educational, and economic segregation.

**REDIG**

A term used in legal and academic contexts, often referring to the process of redrawing or altering a boundary or map. Redigging can involve changes to property lines, streets, or other geographical features.
occupied by a government of immunity to privilege. Right-of-way may be shared (as streets, avenues, highways) for the provision of services for residential use and commercial use.

New York stimulated new construction in the State, federal, and local government to ease its housing shortage, and a title to do something he would not otherwise be likely to do.

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

LICENSE. The instrument (as a deed) that constitutes a legal just cause of exclusive possession (of land, dwellings, or both). (U.S.D.P.)

TITLE. The instrument (as a deed) that constitutes a legally just cause of exclusive possession (of land, dwellings, or both). (U.S.D.P.)

SHELL PIPE. A pipe for a dwelling which carries the water discharge from water closets. (U.S.D.P.)

TRAP. A fitting that provides a water seal to prevent sewer gases and odors being discharged through fixtures. (U.S.D.P.)

WATER. Water supply distribution component which interrupts the supply for maintenance purposes. (U.S.D.P.)

VENT. A pipe opening to the atmosphere, which provides ventilation for a drainage system and prevents trap siphonage or back pressure. (U.S.D.P.)

WATER. A water pipe carrying water from water basin, sink, and similar fixtures. (U.S.D.P.)

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

WATERWORKS. The drainage system or drainage basins from which the waters of a stream or sewer system are drawn. (Merriam-Webster, 1971)

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

WATER. Watts (2) measure the power of electricity through a circuit. Wattage is the product of voltage times amperes. Both watts and horsepower denote the rate of work being done. 16w = 1hp. (Merriam-Webster, 1971)

ZONING ORGANIZATION. The decimation of a city by ordnance into zones (areas/distincts) and the establishment of regulations to govern the use of land and the location, bulk, height, shape, use, population density, and coverage of structures within each zone. (U.S.D.P.)
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EXPLANATORY NOTE

QUALITY OF INFORMATION

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

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

Accurate: when taken from reliable or actual sources.

Tentative: when based upon rough estimations of limited sources.

QUALITY OF SERVICES, FACILITIES AND UTILITIES

None: when the existence of services, facilities and utilities are unavailable to a locality.

Limited: when the existence of services, facilities and utilities are available to a locality in a limited manner due to proximity.

Adequate: when the existence of services, facilities and utilities are available to a locality.

METRIC SYSTEM EQUIVALENTS

Linear Measures

1 centimeter = 0.3937 inches
1 meter = 39.37 inches or 3.28 feet
1 kilometer = 3,280.83 feet or 0.62137 miles
1 inch = 2.54 centimeters
1 foot = 0.3048 meters
1 mile = 1.60934 kilometers

Square Measures

1 square meter = 1550 square inches or 10.7639 square feet
1 hectare = 10,000 sq. m = 2.4711 acres
1 square foot = 0.0929 square meters
1 acre = 0.4047 hectares

DOLLAR EQUIVALENTS

All money data has been expressed in terms of the US Dollar. 1 US Dollar = 22.60 Mexican Pesos.