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Population Growth, Land Development, and Housing in Mexico City

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**Population Growth,
Land Development, and
Housing in Mexico City**

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&
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University of California at Berkeley

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Introduction

The purpose of this working paper is to compile information on population growth, land use trends, infrastructure, and housing activities in Mexico City, to serve as a basis for more detailed field research. Historically, Mexico City has experienced a continuous process of population growth and urban expansion, which has resulted in excessive pressures on land, housing, and physical infrastructure. This paper looks at Mexico City's rapid urban expansion, and the resulting population, housing, and land distribution patterns.

The paper concentrates on three aspects of Mexico City's development: first, it describes the historic evolution and geographic distribution of population within the metropolitan area, and the different development forces that have triggered this growth since the 1950s. Historical population data are presented for individual jurisdictions in the Federal District and the State of Mexico, as well as for the geographic sub-regions or groups of jurisdictions.

Second, it describes several aspects related to land structure and land use patterns, such as the physical characteristics of land and how these have influenced the settlement patterns; the physical infrastructure throughout the city; the land use conversion from rural to urban uses; and the availability of land for current and future development. It concentrates particularly on the mechanisms affecting the supply of land for both formal and informal urban settlements, including the regularization of illegally settled areas and the conversion of public lands into private ownership.

Third, it presents data on housing, including total housing stock, geographical distribution of housing in the metropolitan area, and growth of the housing stock and housing occupancy since 1950. It concentrates on three

housing sectors: private housing, public housing, and popular housing, emphasizing the role each sector has played in supplying housing for a growing population during the last three decades.

I. Population Growth in Mexico City

The Metropolitan Area of Mexico City (MAMC)¹ has experienced an accelerated process of population growth and urban expansion in the second half of this century. For the last four decades, the MAMC has maintained annual growth rates that range from 5.1 percent in the 1950s and 1960s, to 4.5 percent in the 1980s. Even with lower rates of growth during the present decade (3.2 percent in 1980-90), the metropolitan area will reach a projected population of 18.8 million people by 1990--that is, six times the 1950 population. This represents an increase in Mexico City's share of the national population from 13 percent in 1950 to 22 percent in 1990 (Table 1).

The population distribution within the metropolitan area presents a clear pattern of urban expansion from central locations towards the periphery. Starting in the 1950s, urban growth shifted from the Distrito Federal (D.F.) territory to the surrounding municipalities of the State of Mexico, as can be seen in the increasing annual rates of growth in the municipalities (9 percent in the 1950s, 15 percent in the 1960s) and the declining rates in the D.F. (from 5 percent in the 1950s, to 2.5 percent in the 1970s). The remaining part of this section describes the population trends in the different localities for the last four decades, population projections for 1990, and the geographic distribution of population within the metropolitan area (see Tables 2-5 for population data and Maps 1 and 2 for the geographic subdivision in the metropolitan area).

During the 1940-50 period, most of the development continued to concentrate in the D.F., with more than 90 percent of Mexico City's population

Table 1

Population Trends in Mexico and the Metropolitan Area of Mexico City (MAMC),
1950-1990

<u>Jurisdiction</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>Annual Rate</u>			
						<u>50-60</u>	<u>60-70</u>	<u>70-80</u>	<u>80-90</u>
Distrito Federal	3,059,183	4,870,876	6,874,165	8,831,079	10,880,322	4.8	3.5	2.5	2.1
State of Mexico	203,895	478,012	1,937,994	4,894,575	7,952,774	8.9	15.0	9.7	5.0
Total MAMC	3,263,078	5,348,888	8,812,159	13,725,654	18,833,096	5.1	5.1	4.5	3.2
% of national population	12.7	15.3	18.3	19.8	21.7				
National population	25,791,017	34,923,129	48,225,238	69,392,835	86,799,970	3.1	3.3	3.7	2.3

SOURCES: 1940 population for the D.F. and State of Mexico from: Boris Graizabord and Hector Salazar, "Expansion fisica de la Ciudad de Mexico," in "Atlas de la Ciudad de Mexico," Colegio de Mexico, Mexico.
 1950-80 population from Table 2.
 1940-1980 national population from "Estadisticas historicas de Mexico," Volume 1, p. 9, Instituto Nacional de Estadistica, Geografia e Informacion, SPP, Mexico.
 The 1990 national population projection from "Population and Vital Statistics Report" (data available as of 1/1/1989, United Nations, Department of Economic and Social Affairs, 1989). This was processed based on the mid-year-1987 population of 81,163,000 population. For 1990, an annual rate of 2.26 (annual rate 1980-87) was used.

Table 2
Population Trends in MAMC (1950-1990)

Jurisdiction	1950	1960	1970	1980	1990	Annual Rate			
						50-60	60-70	70-80	80-90
<u>Distrito Federal</u>									
Alvaro Obregon	125,771	220,011	456,709	639,213	788,865	5.8	7.6	3.4	2.1
Azcapotzalco	188,596	370,724	534,554	601,524	660,700	7.0	3.7	1.2	0.9
Coyoacan	68,952	169,811	339,446	597,129	911,536	9.4	7.2	5.8	4.3
Cuajimalpa	9,720	19,199	36,200	91,200	152,685	7.0	6.5	9.7	5.3
Gustavo A. Madero	290,826	579,180	1,186,107	1,513,360	1,822,002	7.1	7.4	2.5	1.9
Iztacalo	37,328	198,904	477,331	570,377	643,112	18.2	9.1	1.8	1.2
Iztapalapa	74,240	254,355	522,095	1,262,354	2,059,815	13.1	7.5	9.2	5.0
Magdalena Contreras	22,044	40,724	75,429	173,105	254,032	6.3	6.4	8.7	3.9
Milpa Alta	18,247	24,379	33,694	53,616	77,239	2.9	3.3	4.8	3.7
Tlahuac	19,566	29,880	62,419	146,923	239,733	4.3	7.6	8.9	5.0
Tlalpan	32,902	61,195	130,719	368,974	612,517	6.4	7.9	10.9	5.2
Xochimilco	47,206	70,381	116,493	217,481	332,650	4.1	5.2	6.4	4.3
Benito Juarez	336,649	427,648	506,588	544,882	501,570	2.4	1.7	0.7	-0.8
Cuauhtemoc	990,572	984,192	855,462	814,983	695,813	-0.1	-1.4	-0.5	-1.6
Miguel Hidalgo	420,716	666,009	655,101	543,062	492,166	4.7	-0.2	-1.9	-1.0
Venustiano Carranza	375,848	754,284	885,818	692,896	635,887	7.2	1.6	-2.4	-0.9
Total (D.F.)	3,059,183	4,870,876	6,874,165	8,831,079	10,880,322	4.8	3.5	2.5	2.1
<u>Estado de Mexico</u>									
Atizapan de Zaragoza	4,834	8,156	44,322	202,248	444,839	5.4	18.4	16.4	8.2
Coacalco	2,320	3,984	13,197	97,353	391,065	5.6	12.7	22.1	14.9
Cuautitlan				30,527	114,798				14.2
Cuautitlan Izcalli	13,645	20,509	41,156	173,754	629,509	4.2	7.2	15.5	13.7
Chalco	22,092	29,725	41,450	78,393	144,200	3.0	3.4	6.6	6.3
Chicoloapan	3,234	4,719	8,750	27,354	71,517	3.9	6.4	12.1	10.1
Chimalhuacan	13,055	76,740	19,946	61,816	160,987	19.4	-12.6	12.0	10.0
Ecatepec	15,265	40,815	216,408	784,507	1,313,449	10.3	18.2	13.7	5.3
Huixquilucan	13,502	16,229	33,527	78,149	166,511	1.9	7.5	8.8	7.9
Ixtapaluca	10,804	20,472	36,722	77,862	155,254	6.6	6.0	7.8	7.1
La Paz	4,203	7,880	32,258	99,436	170,281	6.5	15.1	11.9	5.5
Naucalpan	30,036	85,828	382,184	730,170	858,661	11.1	16.1	6.7	1.6
Nezahualcoyotl			580,436	1,341,230	1,581,652			8.7	1.7
Nicolas Romero	23,384	29,617	47,504	112,645	244,961	2.4	4.8	9.0	8.1
Tecamac	9,119	11,971	20,882	84,129	256,499	2.8	5.7	15.0	11.8
Tlalnepantla	29,144	105,447	366,935	778,173	1,024,701	13.7	13.3	7.8	2.8
Tultitlan	9,258	15,920	52,317	136,829	223,890	5.6	12.6	10.1	5.0
Total (State)	203,895	478,012	1,937,994	4,894,575	7,952,774	8.9	15.0	9.7	5.0
Total MAMC	3,263,078	5,348,888	8,812,159	13,725,654	18,833,096	5.1	5.1	4.5	3.2

SOURCES: The 1960-80 population data from Census data 1960/70/80.

For the central delegations (1960-70), an adjustment was made to total the aggregated census data according to Alonso Concheiro, A., "Estructura interna de usos del suelo en el D.F. por delegacion," Fundacion Barros Sierra, Mexico D.F., 1983 (Cuadro I.2).

The 1950 population data from "Estudio Demografico para el plan director de desarrollo urbano del D.F.," El Colegio de Mexico Centro de Estudios economicos y Demograficos, Mexico D.F. 1975, pp. 22-26; and Garza and Schteingart, 1978b, "La accion habitacional del estado en Mexico," El Colegio de Mexico. The population in central delegations (Benito Juarez, Cuauhtemoc, M. Hidalgo, and V. Carranza) was calculated based on a total of 1,448,422, according to estimated percentages based on the 1950 population. Estimation for the 1990 population from: Virgilio Partida Bush, "Proyecciones de la poblacion de la zona metropolitana de la Ciudad de Mexico," in Atlas de la Ciudad de Mexico, COLMEX, 1988.

Table 3

Population Trends by Geographic Area* in MAMC (1950-1990)

Jurisdiction	1950	1960	1970	1980	1990	Annual Rate			
						50-60	60-70	70-80	80-90
Distrito Federal									
North	479,422	949,904	1,720,661	2,114,884	2,482,702	7.1	6.1	2.1	1.6
South	186,873	355,646	682,771	1,384,123	2,173,675	6.6	6.7	7.3	4.6
East	487,416	1,207,543	1,885,244	2,525,627	3,338,814	9.5	4.6	3.0	2.8
West	578,251	945,943	1,223,439	1,446,580	1,687,748	5.0	2.6	1.7	1.6
Center	1,327,221	1,411,840	1,362,050	1,359,865	1,197,383	0.6	-0.4	-0.0	-1.3
Total (D.F.)	3,059,183	4,870,876	6,874,165	8,831,079	10,880,322	4.8	3.5	2.5	2.1
State of Mexico									
North	11,578	19,904	65,514	234,182	614,955	5.6	12.7	13.6	10.1
NW	71,007	163,729	499,917	1,297,347	2,458,808	8.7	11.8	10.0	6.6
NE	24,384	52,786	237,290	868,636	1,569,948	8.0	16.2	13.9	6.1
West	43,538	102,057	415,711	808,319	1,025,172	8.9	15.1	6.9	2.4
East	53,388	139,536	719,562	1,686,091	2,283,891	10.1	17.8	8.9	3.1
Total (State)	203,895	478,012	1,937,994	4,894,575	7,952,774	8.9	15.0	9.7	5.0
Total (MAMC)	3,263,078	5,348,888	8,812,159	13,725,654	18,833,096	5.1	5.1	4.5	3.2

*The geographic areas are organized as follows:

D.F.	North:	Azcapotzalco and Gustavo A. Madero
	South:	Coyoacan, Milpa Alta, Tlahuac, Tlalpan, and Xochimilco
	East:	Iztacalo, Iztapalapa, and Venustiano Carranza
	West:	Alvaro Obregon, Cuajimalpa, Magdalena Contreras, and Miguel Hidalgo
	Center:	Benito Juarez and Cuauhtemoc
State of Mexico	North:	Coacalco and Tultitlan
	Northwest:	Atizapa de Zaragoza, Cuautitlan, Cuautitlan Izcalli, Nicolas Romero, and Tlalnepantla
	Northeast:	Ecatepec and Tecamac
	West:	Muixquilucan and Naucalpan
	East:	Chalco, Chicoloapan, Chimalhuacan, Ixtapaluca, La Paz, and Nezahualcoyotl

SOURCES: Same as in Table 2.

Table 4

Population Growth and Growth Share in the MAMC (1950-1990)

Jurisdiction	Growth				Percent of Growth in MAMC			
	1950-60	1960-70	1970-80	1980-90	1950-60	1960-70	1970-80	1980-90
<u>Distrito Federal</u>								
Alvaro Obregon	94,240	236,698	182,504	149,652	4.5	6.8	3.7	2.9
Azcapotzalco	182,128	163,830	66,970	59,176	8.7	4.7	1.4	1.2
Coyoacan	100,859	169,635	257,683	314,407	4.8	4.9	5.2	6.2
Cuajimalpa	9,479	17,001	55,000	61,485	0.5	0.5	1.1	1.2
Gustavo A. Madero	288,354	606,927	327,253	308,642	13.8	17.5	6.7	6.0
Iztacalo	161,576	278,427	93,046	72,735	7.7	8.0	1.9	1.4
Iztapalapa	180,115	267,740	740,259	797,461	8.6	7.7	15.1	15.6
Magdalena Contreras	18,680	34,705	97,676	80,927	0.9	1.0	2.0	1.6
Milpa Alta	6,132	9,315	19,922	23,623	0.3	0.3	0.4	0.5
Tlahuac	10,314	32,539	84,504	92,810	0.5	0.9	1.7	1.8
Tlalpan	28,293	69,524	238,255	243,543	1.4	2.0	4.8	4.8
Xochimilco	23,175	46,112	100,988	115,169	1.1	1.3	2.1	2.3
Benito Juarez	90,999	78,940	38,294	(43,312)	4.4	2.3	0.8	-0.8
Cuauhtemoc	(6,380)	(128,730)	(40,479)	(119,170)	-0.3	-3.7	-0.8	-2.3
Miguel Hidalgo	245,293	(10,908)	(112,039)	(50,896)	11.8	-0.3	-2.3	-1.0
Venustiano Carranza	378,436	131,534	(192,922)	(57,009)	18.1	3.8	-3.9	-1.1
Total (D.F.)	1,811,693	2,003,289	1,956,914	2,049,243	86.9	57.8	39.8	40.1
<u>Estado de Mexico</u>								
Atizapan de Zaragoza	3,322	36,166	157,926	242,591	0.2	1.0	3.2	4.7
Coacalco	1,664	9,213	84,156	293,712	0.1	0.3	1.7	5.8
Cuautitlan	0	0	30,527	84,271	0.0	0.0	0.6	1.6
Cuautitlan Izcalli	6,864	20,647	132,598	455,755	0.3	0.6	2.7	8.9
Chalco	7,633	11,725	36,943	65,807	0.4	0.3	0.8	1.3
Chicoloapan	1,485	4,031	18,604	44,163	0.1	0.1	0.4	0.9
Chimalhuacan	63,685	(56,794)	41,870	99,171	3.1	-1.6	0.9	1.9
Ecatepec	25,550	175,593	568,099	528,942	1.2	5.1	11.6	10.4
Huixquilucan	2,727	17,298	44,622	88,362	0.1	0.5	0.9	1.7
Ixtapaluca	9,668	16,250	41,140	77,392	0.5	0.5	0.8	1.5
La Paz	3,677	24,378	67,178	70,845	0.2	0.7	1.4	1.4
Naucalpan	55,792	296,356	347,986	128,491	2.7	8.6	7.1	2.5
Nezahualcoyotl	0	580,436	760,794	240,422	0.0	16.8	15.5	4.7
Nicolas Romero	6,233	17,887	65,141	132,316	0.3	0.5	1.3	2.6
Tecamac	2,852	8,911	63,247	172,370	0.1	0.3	1.3	3.4
Tlalnepantla	76,303	261,488	411,238	246,528	3.7	7.6	8.4	4.8
Tultitlan	6,662	36,397	84,512	87,061	0.3	1.1	1.7	1.7
Total (State)	274,117	1,459,982	2,956,581	3,058,199	13.1	42.2	60.2	59.9
Total MAMC	2,085,810	3,463,271	4,913,495	5,107,442	100.0	100.0	100.0	100.0

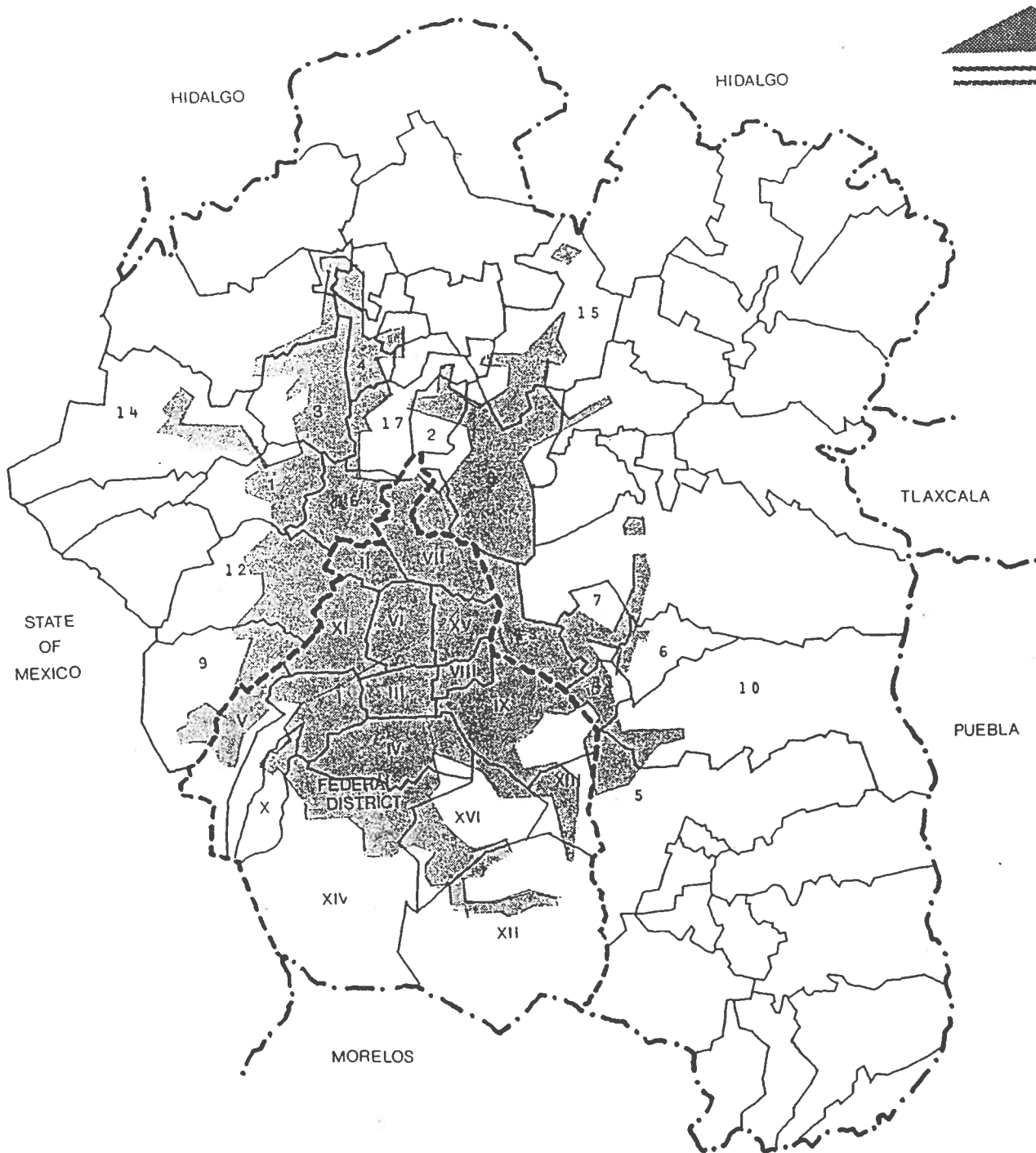
SOURCES: Processed from Table 3.

Table 5

Population Growth by Geographic Region (1950-1990)

<u>Jurisdiction</u>	<u>Growth</u>				<u>Percent of Growth in MAMC</u>			
	<u>1950-60</u>	<u>1960-70</u>	<u>1970-80</u>	<u>1980-90</u>	<u>1950-60</u>	<u>1960-70</u>	<u>1970-80</u>	<u>1980-90</u>
<u>Distrito Federal</u>								
North	470,482	770,757	394,223	367,818	22.6	22.3	8.0	7.2
South	168,773	327,125	701,352	789,552	8.1	9.4	14.3	15.5
East	720,127	677,701	640,383	813,187	34.5	19.6	13.0	15.9
West	367,692	277,496	223,141	241,168	17.6	8.0	4.5	4.7
Center	84,619	(49,790)	(2,185)	(162,482)	4.1	-1.4	-0.0	-3.2
Total D.F.	1,811,693	2,003,289	1,956,914	2,049,243	86.9	57.8	39.8	40.1
<u>State of Mexico</u>								
North	8,326	45,610	168,668	380,773	0.4	1.3	3.4	7.5
NW	92,722	336,188	797,430	1,161,461	4.4	9.7	16.2	22.7
NE	28,402	184,504	631,346	701,312	1.4	5.3	12.8	13.7
West	58,519	313,654	392,608	216,853	2.8	9.1	8.0	4.2
East	86,148	580,026	966,529	597,800	4.1	16.7	19.7	11.7
Total (State)	274,117	1,459,982	2,956,581	3,058,199	13.1	42.2	60.2	59.9
Total MAMC	2,085,810	3,463,271	4,913,495	5,107,442	100.0	100.0	100.0	100.0

SOURCES: Processed from Table 4. See Table 3 for description of geographic areas.

Distrito Federal

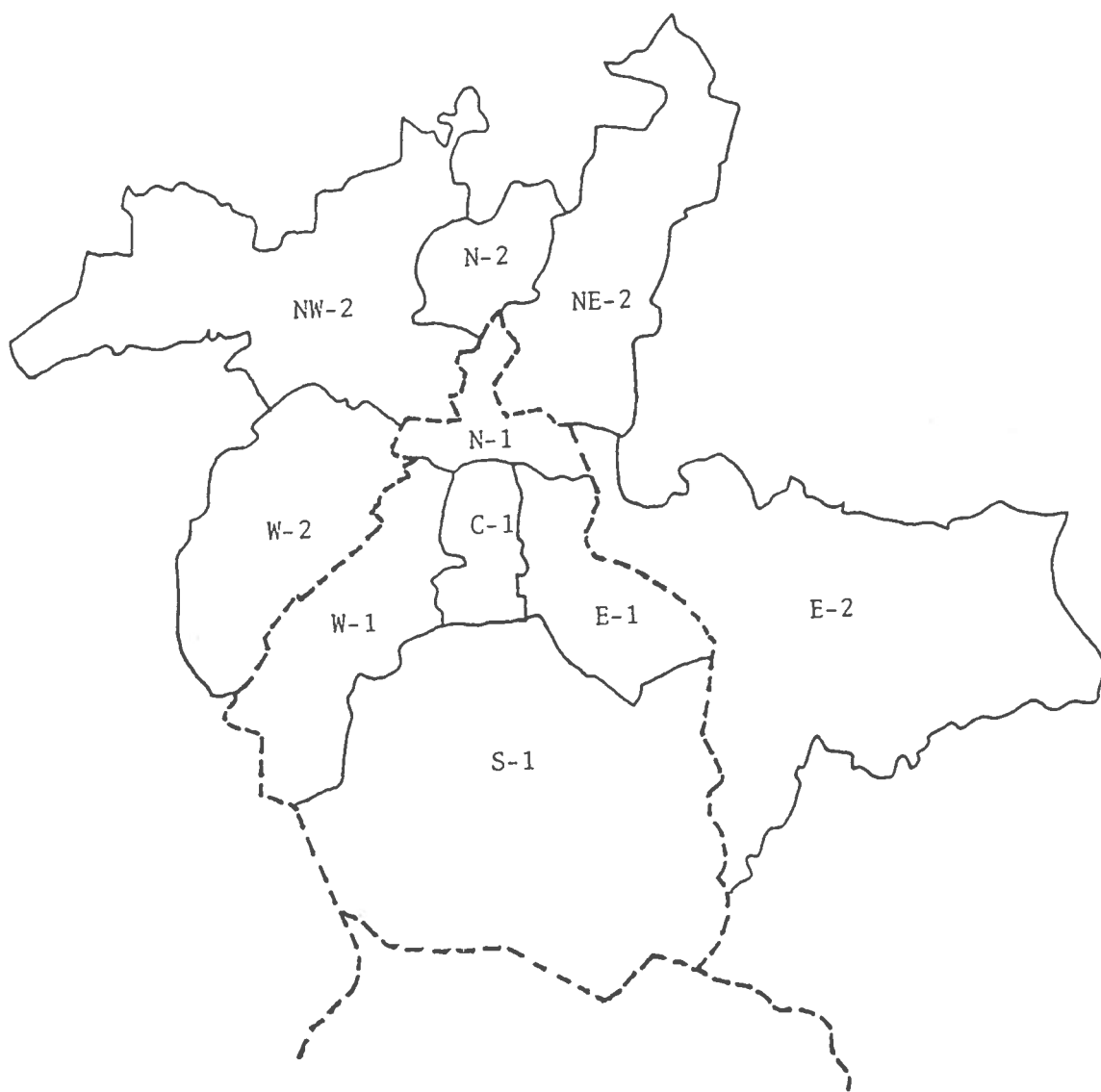
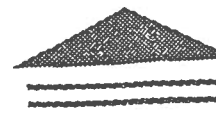
- I. Alvaro Obregon
- II. Azcapotzalco
- III. Benito Juarez
- IV. Coyoacan
- V. Cuajimalpa
- VI. Cuauhtemoc
- VII. Gustavo A. Madero
- VIII. Iztacalo
- IX. Iztapalapa
- X. Magdalena Contreras
- XI. Miguel Hidalgo
- XII. Milpa Alta
- XIII. Tlahuac
- XIV. Tlalpan
- XV. Venustiano Carranza
- XVI. Xochimilco

Estado de Mexico

1. Atizapan de Zaragoza
2. Coacalco
3. Cuautitlan
4. Cuautitlan Izcalli
5. Chalco
6. Chicoloapan
7. Chimalhuacan
8. Ecatepec
9. Huixquilucan
10. Ixtapaluca
11. La Paz
12. Naucalpan
13. Nezahualcoyotl
14. Nicolas Romero
15. Tecamac
16. Tlalnepantla
17. Tultitlan

0 2.5 5 10 30km
1.5 3 6 18m

- STATE BOUNDARY
 --- FEDERAL DISTRICT
 --- MUNICIPALITY/DELEGATION
 [shaded area] URBANIZATION



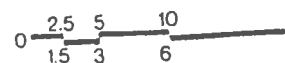
GEOGRAPHIC AREAS

Distrito Federal:

[N-1]	North:	Azcapotzalco and Gustavo A. Madero
[S-1]	South:	Coyoacan, Milpa Alta, Tlahuac, Tlalpan, and Xochimilco
[E-1]	East:	Iztacalo, Iztapalapa, and Venustiano Carranza
[W-1]	West:	Alvaro Obregon, Cuajimalpa, Magdalena Contreras, and Miguel Hidalgo
[C-1]	Center:	Benito Juarez and Cuauhtemoc

Estado de Mexico

[N-2]	North:	Coacalco and Tultitlan
[NW-2]	Northwest:	Atizapa de Zaragoza, Cuautitlan, Cuautitlan Izcalli, Nicolas Romero, and Tlalnepantla
[NE-2]	Northeast:	Ecatepec and Tecamac
[W-2]	West:	Huixquilucan and Naucalpan
[E-2]	East:	Chalco, Chicoloapan, Chimalhuacan, Ixtapaluca, La Paz, and Nezahualcoyotl.



--- FEDERAL DISTRICT

still confined there. Over one-half of the region's population was located in the central delegation of Cuauhtemoc, and 35 percent in three contiguous delegations, B. Juarez, M. Hidalgo, and V. Carranza. The fastest-growing delegations were, however, the northern delegations of G.A. Madero and Azcapotzalco, and the eastern delegations of Iztacalo and Iztapalapa. The proximity to downtown areas, the large labor demand created by the industrial plants in the northern fringes, and the availability of suitable areas for construction activities were among the factors that triggered the development of these new areas.

During the 1950-60 decade, the central delegations became saturated and urban growth slowed. Iztacalo and Iztapalapa to the east, G.A. Madero and V. Carranza to the northeast, and M. Hidalgo to the west continued to grow at annual rates of 18 percent, 13 percent, 7 percent, 7 percent, and 5 percent respectively, and together accounted for 68 percent of total growth in the city. New expansions took place along major commercial corridors, the most important of which were Insurgentes Av. and Reforma Boulevard.

Parallel to this growth in the D.F., an emerging development in the northern municipalities of Naucalpan and Tlalnepantla started to take place, this time triggered by the development of new industrial areas and by the opening of suburban locations for middle- and high-income groups. Despite this emerging growth in the municipalities during the fifties, by the end of the decade 90 percent of the metropolitan population was still concentrated in the D.F.

The 1960s decade marks a shift in growth trends in the metropolis. The declining growth rates in the D.F (with the exception of the western and southern delegations) contrasted sharply with the growing annual rates in the peripheral municipalities. Two types of settlements occurred in the

municipalities during this decade. One type had a population constituted of rural migrants, who in most cases settled illegally in the eastern and northeastern municipalities, generally along the Mexico City-Puebla motorway.² Netzahualcoyotl, which absorbed more than half a million people in less than a decade, is the best example of this type of settlement.

The other type of settlement that located in the municipalities involved new residential areas in the western and northwestern fringes. These new subdivisions were given access through the newly built Anillo Periferico, which heads north towards the Mexico City-Queretaro motorway in the northern section of the city, and through Reforma and Las Palmas Avenue, both heading west towards the Mexico City-Toluca motorway. The municipalities in these areas grew at annual rates of 16 percent; Naucalpan and Tlalnepantla alone reached more than a quarter million population by the end of the decade. Overall, the municipalities in the state increased their share of the total population growth in the MAMC from 13 percent in the 1950-60 decade to 42 percent in the 1960-70 decade. By 1970, the municipalities already held 22 percent of the total population in the city.

In the 1970s decade, the only areas within the D.F. that experienced rapid population growth were the western and southern delegations. New residential subdivisions were authorized in the southern fringes of the city, especially along the Anillo Periferico highway. The south became an important commercial and cultural center, attracting middle-income households to the area. While the southern fringes kept absorbing a growing middle class (professionals and government workers, mainly) at annual rates as high as 10 percent (as in the case of Tlalpan), the southwestern delegations in the D.F. absorbed illegal settlements, especially along the Mexico City-Toluca motorway. Cuajimalpa and M. Contreras grew at annual rates above 8 percent; much of this

growth involved informal settlements located in areas that had difficult access due to the steep terrain.

During the 1970s, the population of the municipalities of the State of Mexico increased suddenly. The eastern fringes grew at an exceptionally fast pace, especially Iztapalapa, which grew at a 9 percent annual rate of growth, absorbing 15 percent of total growth in the metropolis. The eastern municipalities in the State of Mexico continued growing at annual rates above 10 percent.³ Ecatepec to the northeast and Netzahualcoyotl to the east alone absorbed 27 percent of total growth in the metropolis. Overall, the municipalities absorbed 60 percent of the total population increase, during the 1970-80 decade, and by 1980 they were already holding 35 percent of the total population in the Metropolis.

The 1980s decade is characterized by a decline in the growth rates in the metropolis. The D.F. reached a low 2.1 percent annual rate of growth, the municipalities 5 percent, and the metropolitan area as a whole, 3.2 percent. In the D.F. the southern fringes still maintained their rapid growth (4.6 percent annual rate). These areas are now absorbing most of the informal settlements that are gradually taking over areas that, until now, were devoted to forest and agricultural activities.

In the State of Mexico, most of this decade's growth has taken place in the northern and eastern municipalities. The northern municipalities of Coacalco, A. de Zaragoza, and Cuautitlan Izcalli are absorbing most of the growth from the "formal" sector (private and public sector housing, and public investment in infrastructure). Because of the improved communications and the suitable conditions for development in these northern areas, many lands have been opened for development or have been put aside as land reserves (see section on land).

In contrast to the type of development in the northern fringes, the eastern municipalities of Chicoloapan, Chimalhuacan, Chalco, and Ixtapaluca are absorbing growth from the "informal" sector (land invasions, illegal subdivisions, and self-help housing). The eastern fringes are highly conducive to informal settlements, due to the deficient natural conditions (flood-prone areas, etc.) and the lack of infrastructure.

It is expected that by 1990 the municipalities of the State of Mexico will reach a 10 percent annual rate of growth, absorbing 60 percent of the total population growth in the metropolis. As a result, by 1990, 42 percent of the total metropolitan population will be located in the municipalities of the State of Mexico.

II. Land structure and land use in the metropolitan area

The population growth patterns described above are closely related to the structure of land and its availability for urban uses. This section summarizes four aspects of land that are important for understanding growth patterns in the city: (1) the physical characteristics of land, (2) patterns of urban expansion, (3) land conversion from rural to urban uses, and (4) availability of land for future development.

Physical land characteristics and level of infrastructure services

The spatial patterns of population growth described above have been shaped by the physical characteristics of the land and the availability of infrastructure in different locations. The distribution of the different types of urban settlements (i.e. residential areas, public housing projects, popular housing, etc.) reflects variations in environmental conditions throughout the metropolis. Generally speaking, the most desirable locations (gentle slopes, stable soil conditions, etc.) have attracted private developers and public

housing agencies, as can be seen in the rapid expansion of residential neighborhoods in the western, northern, and southwestern portions of the city, as well as the public housing projects in the northern areas. These lands have been incorporated successfully into the formal urban land markets, experiencing a tremendous boom in land prices during the last years. In contrast, areas developed along the eastern fringes are highly vulnerable, due to their soil instability and high vulnerability to flood hazards. These areas have been subject to massive land invasions from the popular sector, as well as to illegal land transactions that take place in informal land and housing markets.

The level of infrastructure services also affects the distribution of population throughout the city. Private developers generally provide the required physical infrastructure as part of the land or house sale package. In most cases, the costs of infrastructure delivery in residential complexes are covered with municipal and real estate resources. In the case of public housing projects, areas with easy access and low-cost infrastructure installations (such as the flatlands in the northern fringes) are preferred over the hilly and unstable terrain found in other areas. In contrast, popular sectors located in the eastern areas do not enjoy an adequate level of infrastructure. Most of these areas lack basic infrastructure, having only dirt streets and illegal hook-ups to municipal electric lines. However, their close location to the interstate motorways allows them to have a relatively easy access to urban employment centers.

Urban expansion and land conversion

The rapid population growth experienced in Mexico City during the last decades has been paralleled by an accelerated process of land conversion from rural to urban uses. Tables 6-7 show the growth in urban areas since 1950. From 1950 to 1980, a total of 40,935 hectares were converted into urban uses in

Table 6
Urbanized Areas in the MAMC (1950-1980)

Jurisdiction	Hectares					Annual Rate		
	Total Area	1950	1960	1970	1980	50-60	60-70	70-80
<u>Distrito Federal</u>								
Alvaro Obregon	9,232.7	1,588.5	2,893.4	3,635.5	4,383.9	6.2	2.3	1.9
Azcapotzalco	3,360.5	1,779.3	2,252.1	3,173.5	3,360.5	2.4	3.5	0.6
Benito Juarez	2,664.1	2,404.6	2,508.6	2,660.8	2,664.1	0.4	0.6	0.0
Coyoacan	5,285.5	1,013.8	2,117.6	3,344.5	5,285.5	7.6	4.7	4.7
Cuajimalpa	8,150.3	183.9	475.4	799.2	1,957.6	10.0	5.3	9.4
Cuauhtemoc	3,009.2	3,009.2	3,009.2	3,009.2	3,009.2	0.0	0.0	0.0
Guastavo A. Madero	8,363.6	1,767.8	3,265.6	5,718.9	7,273.6	6.3	5.8	2.4
Iztacalo	2,210.4	432.2	907.1	1,986.4	2,210.4	7.7	8.2	1.1
Iztapalapa	12,655.0	1,137.9	2,177.1	5,705.0	12,655.0	6.7	10.1	8.3
Magdalena Contreras	6,212.7	618.4	907.1	1,307.3	1,473.7	3.9	3.7	1.2
Miguel Hidalgo	4,868.8	2,809.2	3,447.0	3,926.5	4,868.6	2.1	1.3	2.2
Milpa Alta	28,197.6				1,630.8			5.0
Tlahuac	9,398.6	418.4	688.2	1,090.2	2,257.6	5.1	4.7	7.6
Tlalpan	30,120.0	625.3	916.5	3,035.0	4,833.5	3.9	12.7	4.8
Venustiano Carranza	3,412.4	2,595.4	2,896.5	3,219.7	3,412.4	1.1	1.1	0.6
Xochimilco	12,183.2	2,480.5	2,586.8	3,298.3	2,522.8	0.4	2.5	-2.6
Total (D.F.)	149,324.6	22,864.4	31,048.2	45,910.0	63,799.2	3.1	4.0	3.3
<u>Estado de Mexico</u>								
Atizapan de Zaragoza	8,987.9				3,685.1			
Coacalco	3,549.9				1,034.8			
Cuautitlan	3,730.3				695.0			
Cuautitlan Izcalli	10,992.5				3,625.1			
Chalco	27,442.6				1,962.6			
Chicoloapan	6,089.8				585.2			
Chimalhuacan	4,660.6				1,925.5			
Ecatepec	15,549.2				8,912.1			
Huixquilucan	14,352.4				1,063.4			
Ixtapaluca	31,944.4				1,568.4			
La Paz	2,722.7				1,501.5			
Naucalpan	14,985.9				6,083.7			
Nezahualcoyotl	6,343.9				4,918.4			
Nicolas Romero	23,350.8				3,115.5			
Tecamac	15,340.5							
Tlalnepantla	6,225.1				6,024.9			
Tultitlan	5,597.5				2,295.0			
Total (State)	201,866.0	1,853.6	4,345.6	17,618.1	48,996.2	8.9	15.0	10.8
Total (MAMC)	351,190.6	24,718.0	35,393.8	63,528.1	112,795.4	3.7	6.0	5.9

SOURCES: Total areas and urban areas in the D.F. for 1980 from "Estudio de zonas homogeneas del DDF," by Goveia, A., 1982.
Urban areas in the D.F. for the period 1950-1970 from Alonso Concheiro, 1985, "Estructura interna de usos del suelo en el D.F.," Fundacion Barros Sierra.
Total areas in the State of Mexico from "Evaluacion del uso del suelo ciclo agricola primavera-verano," Estado de Mexico, Sistema Estatal de Informacion, 1986.
Mexico. These areas include the categories of "erosion" and "other uses."
Urban areas in the State of Mexico for the year 1980 from: Gobierno del Estado de Mexico, "El Suelo, recurso estrategico para el desarrollo urbano," UAEM, Toluca, 1984 (table 5 p. 59), cited by Graizabord and Salazar Sanchez "Expansion fisica de la Ciudad de Mexico," in Atlas de la Ciudad, Colmex, 1988.

Table 7

Urbanized Areas in the MAMC by Geographic Region (1950-1980)

<u>Jurisdiction</u>	<u>Hectares</u>					<u>Annual Rate</u>		
	<u>Total Area</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>50-60</u>	<u>60-70</u>	<u>70-80</u>
<u>Distrito Federal</u>								
North	11,724.1	3,547.1	5,517.7	8,892.4	10,634.1	4.5	4.9	1.8
South	85,184.9	4,538.0	6,309.1	10,768.0	16,530.2	3.3	5.5	4.4
East	18,277.8	4,165.5	5,980.7	10,911.1	18,277.8	3.7	6.2	5.3
West	28,464.5	5,200.0	7,722.9	9,668.5	12,683.8	4.0	2.3	2.8
Center	5,673.3	5,413.8	5,517.8	5,670.0	5,673.3	0.2	0.3	0.0
Total (D.F.)	149,324.6	22,864.4	31,048.2	45,910.0	63,799.2	3.1	4.0	3.3
<u>State of Mexico</u>								
North	9,147.4				3,329.8			
NW	53,286.6				17,145.6			
NE	30,889.7				8,912.1			
West	29,338.3				7,147.1			
East	79,204.0				12,461.6			
Total (State)	201,866.0	1,853.6	4,345.6	17,618.1	48,996.2	8.9	15.0	10.8
Total (MAMC)	351,190.6	24,718.0	35,393.8	63,528.1	112,795.4	3.7	6.0	5.9

SOURCES: Processed from Table 6. See Table 3 for description of geographic areas.

the D.F.; in the municipalities more than 47,000 hectares were converted into urban uses during the same period. This represents a 215 percent increase in the D.F. (1950-80) and more than a 3,000 percent in the municipalities. On average, 1,365 and 1,571 hectares/year have been incorporated into urban uses in the D.F. and in the municipalities, respectively.

Besides the high rates of urban expansion in the metropolitan area, one can also find moderate urban densities throughout the city, compared to other cities in the world. Urban densities in the metropolitan area average 138 inhabitants/hectare in the D.F., and 100 inhabitants/hectare in the municipalities (Tables 8-9). Overall, urban densities are higher in the D.F. than in the municipalities, indicating an increasingly important role of the latter in accommodating future urban growth in the metropolis. Another indicator of the relative importance of peripheral locations in absorbing new growth is the decline in housing occupancy in the D.F., from 5.8 occupants/housing unit in 1960, to 5.0 in 1980, while in the municipalities it has increased from 5.7 to 5.9 during the same period (processed from census tracts). This indicates that the existing land and housing stock in the D.F. is of limited capacity, and that areas located farther out into the municipalities are capable of absorbing larger segments of the population (in this case larger families) than the already saturated D.F.

Land conversion from rural to urban land uses

The population growth and urban expansion observed in Mexico City has strongly depended on how land is incorporated into urban uses. Questions related to land ownership, legal mechanisms used to convert agricultural lands into urban uses, and land regularization processes occurring once lands are illegally appropriated are all relevant for understanding the land conversion process.

Table 8

Urban Population Densities in the MAMC (1980)

Jurisdiction	Hectares		Percent of Area Urbanized	Total Population 1980	Urban Population Densities, Inhab/ha.
	Total Area	Urbanized Area 1980			
<u>Distrito Federal</u>					
Alvaro Obregon	9,232.7	4,383.9	47.5	639,213	145.8
Azcapotzalco	3,360.5	3,360.5	100.0	601,524	179.0
Benito Juarez	2,664.1	2,664.1	100.0	544,882	204.5
Coyoacan	5,285.5	5,285.5	100.0	597,129	113.0
Cuajimalpa	8,150.3	1,957.6	24.0	91,200	46.6
Cuauhtemoc	3,009.2	3,009.2	100.0	814,983	270.8
Guastavo A. Madero	8,368.8	7,273.6	87.0	1,513,360	208.1
Iztacalo	2,210.4	2,210.4	100.0	570,377	258.0
Iztapalapa	12,655.0	12,655.0	100.0	1,262,354	99.8
Magdalena Contreras	6,212.7	1,473.7	23.7	173,105	117.5
Miguel Hidalgo	4,868.8	4,868.6	100.0	543,062	111.5
Milpa Alta	28,197.6	1,630.8	5.8	53,616	32.9
Tlahuac	9,398.6	2,257.6	24.0	146,923	65.1
Tlalpan	30,120.0	4,833.5	16.0	368,974	76.3
Venustiano Carranza	3,412.4	3,412.4	100.0	692,896	203.1
Xochimilco	12,183.2	2,522.8	20.7	217,481	86.2
Total (D.F.)	149,324.6	63,799.2	42.7	8,831,079	138.4
<u>Estado de Mexico</u>					
Atizapan de Zaragoza	8,987.9	3,685.1	41.0	202,248	54.9
Coacalco	3,549.9	1,034.8	29.2	97,353	94.1
Cuautitlan	3,730.3	695.0	18.6	30,527	43.9
Cuautitlan Izcalli	10,992.5	3,625.1	33.0	173,754	47.9
Chalco	27,442.6	1,962.6	7.2	78,393	39.9
Chicoloapan	6,089.8	585.2	9.6	27,354	46.7
Chimalhuacan	4,660.6	1,925.5	41.3	61,816	32.1
Ecatepec	15,549.2	8,912.1	57.3	784,507	88.0
Huixquilucan	14,352.4	1,063.4	7.4	78,149	73.5
Ixtapaluca	31,944.4	1,568.4	4.9	77,862	44.6
La Paz	2,722.7	1,501.5	55.1	99,436	66.2
Naucalpan	14,985.9	6,083.7	40.6	730,170	120.0
Nezahualcoyotl	6,343.9	4,918.4	77.5	1,341,230	272.7
Nicolas Romero	23,350.8	3,115.5	13.3	112,645	36.2
Tecamac	15,340.5	N/A	N/A	84,129	N/A
Tlalnepantla	6,225.1	6,024.9	96.8	778,173	129.2
Tultitlan	5,597.5	2,295.0	41.0	136,829	59.6
Total (State)	201,866.0	48,996.2	24.3	4,894,575	99.9
Total (MAMC)	351,190.6	112,795.4	32.1	13,725,654	121.7

SOURCES: Areas from Table 6; population figures from Table 2.

Table 9

Urban Population Densities in the MAMC (1980)

<u>Jurisdiction</u>	<u>Hectares</u>		<u>Percent of Area Urbanized</u>	<u>Total Population 1980</u>	<u>Urban Population Densities, Inhab./ha.</u>
	<u>Total Area</u>	<u>Urbanized Area 1980</u>			
<u>Distrito Federal</u>					
North	11,724.1	10,634.1	90.7	2,114,884	198.9
South	85,184.9	16,530.2	19.4	1,384,123	83.7
East	18,277.8	18,277.8	100.0	2,525,627	138.2
West	28,464.5	12,683.8	44.6	1,446,580	114.0
Center	5,673.3	5,673.3	100.0	1,359,865	239.7
Total (D.F.)	149,324.6	63,799.2	42.7	8,831,079	138.4
<u>State of Mexico</u>					
North	9,147.4	3,329.8	36.4	234,182	70.3
NW	53,286.6	17,145.6	32.2	1,297,347	75.7
NE	30,889.7	8,912.1	28.9	868,636	97.5
West	29,338.3	7,147.1	24.4	808,319	113.1
East	79,204.0	12,461.6	15.7	1,686,091	135.3
Total (State)	201,866.0	48,996.2	24.3	4,894,575	99.9
Total (MAMC)	351,190.6	112,795.4	32.1	13,725,654	121.7

SOURCES: Same as Table 8.

A large portion of the land that is now undergoing development pressures is under public/collective land ownership, officially constituted as "ejido and communal lands"⁴ (Table 10). A large percentage of the total area in the D.F. belongs to this category.⁵ The original social and economic orientation of these lands, which is based on small and medium agricultural landholdings and oriented towards the local economy, is gradually shifting towards urban commercial uses. This can be seen in the extensive conversion of these lands into urban uses throughout the past decades⁶ (Tables 11-12).

The settlements that are gradually taking over these lands vary in their origins and motives. Some settlements are constituted by poor sectors of the population who are looking for available land for shelter. Others are constituted by middle- and high-income sectors who are attracted to these lands by new real estate investment opportunities and better living conditions in outskirt locations. Finally, some of these lands attract the interest of the public sector for the development of public infrastructure projects.

The land use conversion from ejido to urban uses is generally accompanied by a process by which the land is freed from its agricultural ties to become part of the urban areas. There are two interrelated legal mechanisms that are used to propel this land conversion process. One, the "regularization process," involves changing the official land tenure from ejido/collective to urban/private land ownership. The regularization mechanism is generally applied to areas that have been already developed through illegal/informal means. In this case, the state extends property titles to settlers who had invaded the land or who had bought the land from informal real estate agents or directly from some of the ejido members.⁷ Previous to this process, the land was expropriated in favor of the state, and then sold to current property users.⁸

Table 10

Collective and Private Land Tenure in Seven Delegations in D.F.

<u>Jurisdiction</u>	<u>Ejido and Communal Lands</u>				<u>Private & Public Lands</u>	
	<u>Hectares</u>		<u>Percent</u>		<u>Area</u>	<u>Percent</u>
	<u>Total</u>	<u>Area</u>	<u>of</u>	<u>Percent</u>		
	<u>Area</u>	<u>1980</u>	<u>Area</u>	<u>of</u>	<u>(ha.)</u>	<u>of Total</u>
			<u>Urbanized</u>	<u>Total</u>		
<u>Distrito Federal</u>						
Alvaro Obregon	9,232.7	1,477.2	15.6	16	7,755.5	84
Cuajimalpa	8,150.3	1,548.6	3.0	19	6,601.7	81
Magdalena Contreras	6,212.7	5,218.7	6.6	84	994.0	16
Milpa Alta	28,197.6	27,351.7	3.6	97	845.9	3
Tlahuac	9,398.6	4,605.3	9.3	49	4,793.3	51
Tlalpan	30,120.0	24,999.6	2.5	83	5,120.4	17
Xochimilco	12,183.2	9,746.6	5.4	80	2,436.6	20
Total (D.F.)	103,495.1	74,947.6	4.2	72	28,547.5	28

SOURCES: Percentages of ejido, communal, and private lands from: Plan Parcial de Desarrollo Urbano de la Zona de Conservacion y Amortiguamiento, DDF, 1981.

Table 11

Land Regularization in D.F. (1978-1986) and State of Mexico (1982-1986)

Jurisdiction	Number of Lots			Area (hectares)			Lots			Area		
	Private Property	Public Property	Total	Private Property	Public Property	Total	Annual Average D.F. (D.F./State) (/5)	% of Total D.F. (D.F./State) (/5)	% of Total (MAMC)	Annual Average D.F. (D.F./State) (/5)	% of Total D.F. (D.F./State) (/5)	% of Total (MAMC)
Distrito Federal												
Alvaro Obregon	28,140	0	28,140	819.45	0.00	819.45	3,127	15.4	6.0	91.05	11.1	4.9
Azcapotzalco	5,044	3,693	8,737	65.34	189.05	254.39	971	4.8	1.9	28.27	3.4	1.5
Benito Juarez	298	0	298	5.11	0.00	5.11	33	0.2	0.1	0.57	0.1	0.0
Coyoacan	11,776	7,547	19,323	562.87	333.72	896.59	2,147	10.6	4.1	99.62	12.1	5.3
Cuajimalpa	3,513	0	3,513	126.42	0.00	126.42	390	1.9	0.8	14.05	1.7	0.8
Cuauhtemoc	219	0	219	8.76	0.00	8.76	24	0.1	0.0	0.97	0.1	0.1
Gustavo A. Madero	7,544	17,756	25,300	200.22	776.61	976.83	2,811	13.9	5.4	108.54	13.2	5.8
Iztacalo	10,932	1,137	12,069	236.41	33.84	270.25	1,341	6.6	2.6	30.03	3.7	1.6
Iztapalapa	35,090	5,532	40,622	858.28	435.57	1,293.85	4,514	22.2	8.7	143.76	17.5	7.7
Magdalena Contreras	112	4,554	4,666	1.69	255.86	257.55	518	2.6	1.0	28.62	3.5	1.5
Miguel Hidalgo	674	0	674	23.07	0.00	23.07	75	0.4	0.1	2.56	0.3	0.1
Milpa Alta	0	0	0	0.00	0.00	0.00	0	0.0	0.0	0.00	0.0	0.0
Tlahuac	5,241	11,657	16,898	270.00	1,142.02	1,412.02	1,878	9.3	3.6	156.89	19.1	8.4
Tlalpan	9,513	9,529	19,042	302.47	581.11	883.58	2,116	10.4	4.1	98.18	12.0	5.2
Venustiano Carranza	1,662	0	1,662	111.96	0.00	111.96	185	0.9	0.4	12.44	1.5	0.7
Xochimilco	1,500	0	1,500	47.57	0.00	47.57	167	0.8	0.3	5.29	0.6	0.3
Total (D.F.)	121,258	61,405	182,663	3,639.62	3,747.78	7,387.40	20,296	100.0	39.1	820.82	100.0	43.8
Estado de Mexico												
Atizapan de Zaragoza	1,420	1,916	3,336	232.35	313.50	545.85	667	1.2	0.7	109	5.8	3.2
Coacalco	1,618	290	1,908	94.43	16.93	111.36	382	0.7	0.4	22	1.2	0.7
Cuautitlan	0	0	0	0.00	0.00	0.00	0	0.0	0.0	0	0.0	0.0
Cuautitlan Izcalli	1,501	683	2,184	67.54	30.74	98.28	437	0.8	0.5	20	1.0	0.6
Chalco	5,492	0	5,492	187.69	0.00	187.69	1,098	1.9	1.2	38	2.0	1.1
Chicoloapan	7,524	0	7,524	257.14	0.00	257.14	1,505	2.6	1.6	51	2.7	1.5
Chimalhuacan	0	16,700	16,700	0.00	483.49	483.49	3,340	5.9	3.6	97	5.1	2.9
Ecatepec	6,188	51,808	57,996	166.98	1,398.12	1,565.10	11,599	20.4	12.4	313	16.5	9.3
Huixquilucan	0	1,144	1,144	0.00	49.93	49.93	229	0.4	0.2	10	0.5	0.3
Ixtapaluca	2,920	1,520	4,440	122.81	63.92	186.73	888	1.6	1.0	37	2.0	1.1
La Paz	0	10,696	10,696	0.00	275.73	275.73	2,139	3.8	2.3	55	2.9	1.6
Naucalpan	5,749	1,429	7,178	131.59	32.71	164.30	1,436	2.5	1.5	33	1.7	1.0
Nezahualcoyotl	1,873	132,943	134,816	49.67	3,526.80	3,576.47	26,963	47.4	28.8	715	37.8	21.2
Nicolas Romero	2,849	3,142	5,991	97.61	107.65	205.26	1,198	2.1	1.3	41	2.2	1.2
Tecamac	0	0	0	0.00	0.00	0.00	0	0.0	0.0	0	0.0	0.0
Tlalnepantla	11,488	10,735	22,223	857.33	801.26	1,658.59	4,445	7.8	4.8	332	17.5	9.8
Tultitlan	1,524	1,524	3,048	49.72	49.72	99.44	610	1.1	0.7	20	1.1	0.6
Total (State)	50,146	234,530	284,676	2,315	7,151	9,465.36	56,935	100.0	60.9	1,893	100.0	56.2
Total (MAMC)	171,404	295,935	467,339	5,955	10,899	16,853	77,231	N/A	100.0	2,714	N/A	100.0

SOURCES: Iracheta, A., "Diez años de planeación del suelo en la ZMCM," El Colegio de México, Seminario Una década de Planeación Urbano Regional en México, May 1988, Tables 2 and 5 (data on the tables were extracted from internal documents in the D.F. plan Land regularization in D.F. (1978-86) and State of Mexico (1982-86) Dirección General de Desarrollo Urbano y Vivienda del Estado de México).

Table 12

Land Regularization in the D.F. (1978-1986) and the State of Mexico (1982-1986)
by Geographic Region

Jurisdiction	Number of Lots			Area (hectares)			Lots			Area		
	Private Property	Public Property	Total	Private Property	Public Property	Total	Annual Average	% of Total	% of Total	Annual Average	% of Total	% of Total
							D.F. (/9) State(/5)	(D.F./ State)	(MAMC)	D.F. (/9) State(/5)	(D.F./ State)	(MAMC)
<u>Distrito Federal</u>												
North	12,588	21,449	34,037	266	966	1,231	3,782	18.6	7.3	136.80	16.7	7.
South	28,030	28,733	56,763	1,183	2,057	3,240	6,307	31.1	12.1	359.97	43.9	19.
East	47,684	6,669	54,353	1,207	469	1,676	6,039	29.8	11.6	186.23	22.7	9.
West	32,439	4,554	36,993	971	256	1,226	4,110	20.3	7.9	136.28	16.6	7.
Center	517	0	517	14	0	14	57	0.3	0.1	1.54	0.2	0.
Total (D.F.)	121,258	61,405	182,663	3,640	3,748	7,387	20,296	100.0	39.1	820.82	100.0	43.
<u>State of Mexico</u>												
North	3,142	1,814	4,956	144	67	211	991	1.7	1.1	42	2.2	1.
NW	17,258	16,476	33,734	1,255	1,253	2,508	6,747	11.8	7.2	502	26.5	14
NE	6,188	51,808	57,996	167	1,398	1,565	11,599	20.4	12.4	313	16.5	9
West	5,749	2,573	8,322	132	83	214	1,664	2.9	1.8	43	2.3	1
East	17,809	161,859	179,668	617	4,350	4,967	35,934	63.1	38.4	993	52.5	29
Total (State)	50,146	234,530	284,676	2,315	7,151	9,465	56,935	100.0	60.9	1,893	100.0	56
Total (MAMC)	171,404	295,935	467,339	5,954	10,898	16,853	93,468		100.0	3,371		100

SOURCES: Processed from Table 10. See Table 3 for description of geographic areas.

A second mechanism involves the expropriation of undeveloped land (where no urban settlement has taken place) for some development purpose. This involves paying compensation to ejidatarios and comuneros for their lands. Expropriatory actions are supposed to be justified on the basis of a public interest and social welfare (i.e. building public facilities or public housing projects). However, in many cases undeveloped ejido and communal lands that have undergone the expropriation process have ended up being sold (at reduced prices) to private developers who carry out highly profitable residential development schemes. This has been a common practice in the municipalities of the State of Mexico.⁹

The principal function of the expropriation mechanism is to provide land for public housing and urban development projects promoted by state agencies.¹⁰ However, this role has been reduced to a minimum. The land regularization agency CORETT (Comision de Regulacion de Tenencia de la Tierra) was created, among other things, to promote new construction and to upgrade and manage land reserves in expropriated areas. However, its functions have been directed exclusively to the expropriation and legalization of already-occupied areas.¹¹

Land regularization has become a widely-used legal instrument to accommodate demands from different sectors in areas where land tenure conflicts exist. In poor sectors of the population, land regularization has been used as a technical and political solution to the problems of illegal settlements and lack of housing. By regularizing informal settlements, a large segment of the popular sector is allowed access to land and informal housing, which would otherwise be impossible to attain.¹² In well-to-do sectors, land expropriation and regularization is viewed as a necessary resource to introduce land into the markets and reduce the gap between the demand and supply of land and housing in

the private sector. Expropriation and distribution of land significantly increases both the supply of land and local revenues in the localities.

The total area that has been regularized in the metropolitan area is significant (Tables 10-11). In the D.F., a total of 7,387 hectares were regularized between 1978 and 1986. This represents an annual average of 820 hectares. Of this, 50 percent were private lands which were regularized after being invaded or subdivided illegally. Much of these private lands were located in Iztapalapa, A. Obregon, and Coyoacan. The other 50 percent regularized were collective and public lands. Within the D.F., 72 percent of the land urbanized between 1978 and 1986 underwent some form of land regularization. In the State of Mexico, a total of 9,465 hectares were regularized between 1982 and 1986. This represents an annual average of 1,890 hectares. Of these, 75 percent were public lands. The Netzahualcoyotl, Ecatepec, and Tlalnepantla municipalities accounted for 21, 9, and 10 percent of the total area regularized in the metropolitan area. Although much of the regularization process was applied towards the popular sectors, a large part of the newly urbanized areas was constituted by lands that had been expropriated and then used to promote private development among the upper classes.¹³

Availability of land for future development

Although much of the growth that has occurred in the last decades has started with some sort of irregularity and has had to undergo a regularization process, today some formal planning strategies are being devised to accommodate current and future growth. One of these strategies involves creating land reserves for various uses. Land reserves are portions of land that have been acquired by the authorities (or are in process of being acquired) and are regulated under special land use planning schemes. Both the D.F. and the State

of Mexico are using this legal device to set aside and assure an efficient use of land.

According to the most recent urban development plan in the D.F. (Garcia Perez, H. 1988), there are 7,980 hectares under reserve, of which 5,822 (73 percent) are assigned for urban uses (housing, services, and industries). The land reserves assigned for housing uses total 906 hectares, which could accommodate from 136,000 to 362,400 people.¹⁴ These areas will be able to accommodate the equivalent of only 21 percent to 56 percent of the total population increase in the D.F. in a three-year period (1986-89).¹⁵

In the municipalities of the State of Mexico, the total land reserves for urban uses (mostly housing) are 3,202 hectares. Using the same projection procedure and population thresholds, these land reserves could accommodate from 480,300 to 1,280,000 people. This is the equivalent of 46 percent to 124 percent of total population increase in the municipalities in a three-year period.¹⁶ A large portion of these land reserves is still in the process of being regularized.¹⁷ Of the total land reserves, 60 percent are located in the northern municipalities, while 40 percent are located in the eastern municipalities.

III. Housing supply and demand

The housing stock in Mexico City follows a historical and geographic pattern similar to population growth and distribution patterns in the metropolitan area. As with population indicators, the housing stock is mostly concentrated in the D.F., but the municipalities in the State of Mexico have experienced higher growth rates in housing stock during the last three decades (Tables 13-14). The municipalities absorbed almost 50 percent of the total increase in housing stock during the 1970s decade, while they held only 32 percent of the total population in the metropolis (Tables 15-16). In a

Table 13

Housing Stock in the MAMC (1950-1980)

Jurisdiction	1950	1960	1970	1980	Annual Rate		
					50-60	60-70	70-80
Distrito Federal							
Alvaro Obregon	17,934	38,958	74,132	122,235	8.1	6.6	5.1
Azcapotzalco	37,073	54,904	91,903	116,479	4.0	5.3	2.4
Benito Juarez	57,500	90,960	98,328	133,973	4.7	0.8	3.1
Coyoacan	13,510	33,145	57,080	117,467	9.4	5.6	7.5
Cuajimalpa	2,011	3,444	5,338	15,446	5.5	4.5	11.2
Cuauhtemoc	200,914	137,421	182,096	198,530	-3.7	2.9	0.9
Gustavo A. Madero	40,964	103,437	195,335	280,251	9.7	6.6	3.7
Iztacalo	6,698	35,505	79,896	105,103	18.2	8.4	2.8
Iztapalapa	14,838	43,961	83,907	224,903	11.5	6.7	10.4
Magdalena Contreras	4,386	7,069	11,649	31,179	4.9	5.1	10.3
Miguel Hidalgo	94,434	118,607	120,920	117,359	2.3	0.2	-0.3
Milpa Alta	4,164	4,931	5,899	9,407	1.7	1.8	4.8
Tlahuac	3,730	5,535	9,346	24,242	4.0	5.4	10.0
Tlalpan	5,854	10,593	22,026	69,747	6.1	7.6	12.2
Venustiano Carranza	112,148	140,449	162,500	141,654	2.3	1.5	-1.4
Xochimilco	10,053	13,124	19,064	39,127	2.7	3.8	7.5
Total (D.F.)	626,211	842,043	1,219,419	1,747,102	3.0	3.8	3.7
Estado de Mexico							
Atizapan de Zaragoza	983	1,404	7,322	36,229	3.6	18.0	17.3
Coacalco	448	670	2,115	17,669	4.1	12.2	23.6
Cuautitlan	2,709	3,537	6,324	6,837	2.7	6.0	0.8
Cuautitlan Izcalli	0	0	0	31,735	N/A	N/A	N/A
Chalco	4,637	5,382	6,403	13,007	1.5	1.8	7.3
Chicoloapan	675	939	1,312	4,780	3.4	3.4	13.8
Chimalhuacan	2,501	12,942	2,819	10,826	17.9	-14.1	14.4
Ecatepec	3,019	7,401	34,502	130,206	9.4	16.6	14.2
Huixquilucan	2,493	2,917	5,000	12,937	1.6	5.5	10.0
Ixtapaluca	2,264	3,645	5,889	12,677	4.9	4.9	8.0
La Paz	963	1,348	8,839	16,941	3.4	20.7	6.7
Naucalpan	6,303	15,325	65,318	134,389	9.3	15.6	7.5
Nezahualcoyotl	0	0	90,338	214,132	N/A	N/A	9.0
Nicolas Romero	4,511	5,538	7,802	19,422	2.1	3.5	9.5
Tecamac	1,814	2,212	3,461	14,921	2.0	4.6	15.7
Tlalnepantla	5,972	17,703	60,367	130,794	11.5	13.1	8.0
Tultitlan	2,059	2,763	8,085	23,985	3.0	11.3	11.5
Total (State)	41,351	83,726	315,896	831,487	7.3	14.2	10.2
Total MAMC	667,562	925,769	1,535,315	2,578,589	3.3	5.2	5.3

SOURCES: Garcia Peralta, B., 1988, "Situacion de la Vivienda en la Zona Metropolitana de Ciudad de Mexico," Cuadro 6.16, p. 205, in Atlas de la Ciudad de Mexico, El Colegio de Mexico.

Table 14

Housing Stock by Geographic Area in MAMC (1950-1980)

Jurisdiction	1950	1960	1970	1980	Annual Rate		
					50-60	60-70	70-80
<u>Distrito Federal</u>							
North	78,037	158,341	287,238	396,730	7.3	6.1	3.3
South	37,311	67,328	113,415	259,990	6.1	5.4	8.6
East	133,684	219,915	326,303	471,660	5.1	4.0	3.8
West	118,765	168,078	212,039	286,219	3.5	2.4	3.0
Center	258,414	228,381	280,424	332,503	-1.2	2.1	1.7
Total (D.F.)	626,211	842,043	1,219,419	1,747,102	3.0	3.8	3.7
<u>State of Mexico</u>							
North	2,507	3,433	10,200	41,654	3.2	11.5	15.1
NW	14,175	28,182	81,815	225,017	7.1	11.2	10.6
NE	4,833	9,613	37,963	145,127	7.1	14.7	14.4
West	8,796	18,242	70,318	147,326	7.6	14.4	7.7
East	11,040	24,256	115,600	272,363	8.2	16.9	8.9
Total (State)	41,351	83,726	315,896	831,487	7.3	14.2	10.2
Total (MAMC)	667,562	925,769	1,535,315	2,578,589	3.3	5.2	5.3

SOURCES: Processed from Table 12. See Table 3 for description of geographic areas.

Table 15

Growth Housing Stock in MAMC (1950-1980)

<u>Jurisdiction</u>	<u>Growth</u>			<u>Percent of Growth in MAMC</u>		
	<u>1950-60</u>	<u>1960-70</u>	<u>1970-80</u>	<u>1950-60</u>	<u>1960-70</u>	<u>1970-80</u>
<u>Distrito Federal</u>						
Alvaro Obregon	21,024	35,174	48,103	8.1	5.8	4.6
Azcapotzalco	17,831	36,999	24,576	6.9	6.1	2.4
Benito Juarez	33,460	7,368	35,645	13.0	1.2	3.4
Coyoacan	19,635	23,935	60,387	7.6	3.9	5.8
Cuajimalpa	1,433	1,894	10,108	0.6	0.3	1.0
Cuauhtemoc	(63,493)	44,675	16,434	-24.6	7.3	1.6
Gustavo A. Madero	62,473	91,898	84,916	24.2	15.1	8.1
Iztacalo	28,807	44,391	25,207	11.2	7.3	2.4
Iztapalapa	29,123	39,946	140,996	11.3	6.6	13.5
Magdalena Contreras	2,683	4,580	19,530	1.0	0.8	1.9
Miguel Hidalgo	24,173	2,313	(3,561)	9.4	0.4	-0.3
Milpa Alta	767	968	3,508	0.3	0.2	0.3
Tlahuac	1,805	3,811	14,896	0.7	0.6	1.4
Tlalpan	4,739	11,433	47,721	1.8	1.9	4.6
Venustiano Carranza	28,301	22,051	(20,846)	11.0	3.6	-2.0
Xochimilco	3,071	5,940	20,063	1.2	1.0	1.9
Total (D.F.)	215,832	377,376	527,683	83.6	61.9	50.6
<u>Estado de Mexico</u>						
Atizapan de Zaragoza	421	5,918	28,907	0.2	1.0	2.8
Coacalco	222	1,445	15,554	0.1	0.2	1.5
Cuautitlan	828	2,787	513	0.3	0.5	0.0
Cuautitlan Izcalli	0	0	31,735	0.0	0.0	3.0
Chalco	745	1,021	6,604	0.3	0.2	0.6
Chicoloapan	264	373	3,468	0.1	0.1	0.3
Chimalhuacan	10,441	(10,123)	8,007	4.0	-1.7	0.8
Ecatepec	4,382	27,101	95,704	1.7	4.4	9.2
Huixquilucan	424	2,083	7,937	0.2	0.3	0.8
Ixtapaluca	1,381	2,244	6,788	0.5	0.4	0.7
La Paz	385	7,491	8,102	0.1	1.2	0.8
Naucalpan	9,022	49,993	69,071	3.5	8.2	6.6
Nezahualcoyotl	0	90,338	123,794	0.0	14.8	11.9
Nicolas Romero	1,027	2,264	11,620	0.4	0.4	1.1
Tecamac	398	1,249	11,460	0.2	0.2	1.1
Tlalnepantla	11,731	42,664	70,427	4.5	7.0	6.8
Tultitlan	704	5,322	15,900	0.3	0.9	1.5
Total (State)	42,375	232,170	515,591	16.4	38.1	49.4
Total MAMC	258,207	609,546	1,043,274	100.0	100.0	100.0

SOURCES: Processed from Table 13.

Table 16

Growth in Housing Stock by Geographic Area in MAMC (1950-1980)

<u>Jurisdiction</u>	<u>Growth</u>			<u>Percent of Growth in MAMC</u>		
	<u>1950-60</u>	<u>1960-70</u>	<u>1970-80</u>	<u>1950-60</u>	<u>1960-70</u>	<u>1970-80</u>
<u>Distrito Federal</u>						
North	80,304	128,897	109,492	31.1	21.1	10.5
South	30,017	46,087	146,575	11.6	7.6	14.0
East	86,231	106,388	145,357	33.4	17.5	13.9
West	49,313	43,961	74,180	19.1	7.2	7.1
Center	(30,033)	52,043	52,079	-11.6	8.5	5.0
Total (D.F.)	215,832	377,376	527,683	83.6	61.9	50.6
<u>State of Mexico</u>						
North	926	6,767	31,454	0.4	1.1	3.0
NW	14,007	53,633	143,202	5.4	8.8	13.7
NE	4,780	28,350	107,164	1.9	4.7	10.3
West	9,446	52,076	77,008	3.7	8.5	7.4
East	13,216	91,344	156,763	5.1	15.0	15.0
Total (State)	42,375	232,170	515,591	16.4	38.1	49.4
Total (MAMC)	258,207	609,546	1,043,274	100.0	100.0	100.0

SOURCES: Processed from Table 15. See Table 3 for description of geographic areas.

parallel fashion, housing occupancy densities have declined in the D.F. from 5.8 to 5.0 people/dwelling unit between 1960 and 1980, while increasing from 5.7 to 5.9 people/dwelling unit in the adjacent municipalities during the same period (Tables 17-18).

The rapid growth in the surrounding municipalities has been accompanied by deficiencies in infrastructure services, which is a good indication of the vulnerable socio-economic and physical conditions to which a large portion of the urban population is exposed. By 1980, 27 percent of total housing stock in the metropolis still lacked sewer connections, and 33 percent lacked water connections (Table 19-20). In the D.F., these deficiencies correlate with the deteriorated living conditions in downtown and peripheral locations, where 14 percent of the total housing stock is considered "temporary," or without solid structures (CENVI 1983). In the municipalities, these deficiencies correlate with unsuitable conditions in low-income settlements, where infrastructure services are introduced after the illegal settlements take place.

Land and housing development activities in Mexico City cover a wide range of solutions. On one side of the land and housing spectrum is the formal housing sector, based primarily on single-family residential units and property ownership. On the other side of the spectrum is the informal land and housing sector, based primarily on illegal land acquisitions (land invasions, squatter settlements, etc.) and on informal means of construction (self-help strategies, mainly). For the purpose of this analysis, we have classified the housing activity into three main groups: (1) housing promoted by the private sector and involving credit from private banks for housing construction or housing commercial transactions, (2) public housing built or promoted by state agencies with federal and state funds, and (3) popular housing built by the informal sector.

Table 17

Housing Occupancy and Densities in MAMC (1960-1980)

<u>Jurisdiction</u>	<u>Occupants</u>			<u>Density (Occ./Housing)</u>		
	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
<u>Distrito Federal</u>						
Alvaro Obregon	220,011	456,709	636,164	5.6	6.2	5.2
Azcapotzalco	370,724	534,554	595,471	6.8	5.8	5.1
Benito Juarez	529,609	508,020	542,447	5.8	5.2	4.0
Coyoacan	169,811	339,446	594,732	5.1	5.9	5.1
Cuajimalpa	19,199	36,200	91,067	5.6	6.8	5.9
Cuauhtemoc	798,662	937,659	807,021	5.8	5.1	4.1
Gustavo A. Madero	579,180	1,186,107	1,506,256	5.6	6.1	5.4
Iztacalo	198,904	477,331	567,894	5.6	6.0	5.4
Iztapalapa	254,355	522,095	1,254,104	5.8	6.2	5.6
Magdalena Contreras	40,724	75,429	172,067	5.8	6.5	5.5
Miguel Hidalgo	688,208	621,235	536,033	5.8	5.1	4.6
Milpa Alta	24,379	53,694	53,465	4.9	9.1	5.7
Tlahuac	29,880	62,419	146,468	5.4	6.7	6.0
Tlalpan	61,195	130,719	363,766	5.8	5.9	5.2
Venustiano Carranza	815,654	836,055	690,084	5.8	5.1	4.9
Xochimilco	70,381	116,493	216,356	5.4	6.1	5.5
Total (D.F.)	4,870,876	6,894,165	8,773,395	5.8	5.7	5.0
<u>Estado de Mexico</u>						
Atizapan de Zaragoza	8,069	44,322	202,248	5.7	6.1	5.6
Coacalco	3,984	13,197	97,353	5.9	6.2	5.5
Cuautitlan	20,509	41,156	39,527	5.8	6.5	5.8
Cuautitlan Izcalli	0	0	173,754	0.0	0.0	5.5
Chalco	29,725	41,450	78,393	5.5	6.5	6.0
Chicoloapan	4,719	8,750	27,354	5.0	6.7	5.7
Chimalhuacan	76,770	19,946	61,816	5.9	7.1	5.7
Ecatepec	40,815	216,408	784,507	5.5	6.3	6.0
Huixquilucan	16,229	33,527	78,149	5.6	6.7	6.0
Ixtapaluca	20,472	36,722	77,862	5.6	6.2	6.1
La Paz	7,880	35,258	99,436	5.8	4.0	5.9
Naucalpan	85,828	382,184	730,170	5.6	5.9	5.4
Nezahualcoyotl	0	580,436	1,341,230	0.0	6.4	6.3
Nicolas Romero	29,617	47,504	112,645	5.3	6.1	5.8
Tecamac	11,971	20,882	84,129	5.4	6.0	5.6
Tlalnepantla	105,447	366,935	778,173	6.0	6.1	5.9
Tultitlan	15,479	52,317	136,829	5.6	6.5	5.7
Total (State)	477,514	1,940,994	4,903,575	5.7	6.1	5.9
Total MAMC	5,348,390	8,835,159	13,676,970	5.8	5.8	5.3

SOURCES: Number of occupants from census 1960-70; housing stock, Table 13. Occupancy in the four central delegations was calculated according to the percentages of the housing units in each delegation. These are: for 1960, B. Juarez 18.7%, Cuauhtemoc 28.2%, M. Hidalgo 24.3%, and V. Carranza 28.8%. For 1970, B. Juarez 17.5%, Cuauhtemoc 32.3%, M. Hidalgo 21.4%, and V. Carranza 28.8%.

Table 18

Housing Occupancy and Densities by Geographic Area (1960-1980)

<u>Jurisdiction</u>	<u>Occupants</u>			<u>Density (Occ./Housing)</u>		
	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
<u>Distrito Federal</u>						
North	949,904	1,720,661	2,101,727	6.0	6.0	5.3
South	355,646	702,771	1,374,787	5.3	6.2	5.3
East	1,268,913	1,835,481	2,512,082	5.8	5.6	5.3
West	968,142	1,189,573	1,435,331	5.8	5.6	5.0
Center	1,328,271	1,445,679	1,349,468	5.8	5.2	4.1
Total (D.F.)	4,870,876	6,894,165	8,773,395	5.8	5.7	5.0
<u>State of Mexico</u>						
North	19,463	65,514	234,182	5.7	6.4	5.6
NW	163,642	499,917	1,306,347	5.8	6.1	5.8
NE	52,786	237,290	868,636	5.5	6.3	6.0
West	102,057	415,711	808,319	5.6	5.9	5.5
East	139,566	722,562	1,686,091	5.8	6.3	6.2
Total (State)	477,514	1,940,994	4,903,575	5.7	6.1	5.9
Total (MAMC)	5,348,390	8,835,159	13,676,970	5.8	5.8	5.3

SOURCES: Processed from Table 17. See Table 3 for description of geographic areas.

Table 19

Houses with Sewer and Water Connections in MAMC (1960-1980)

Jurisdiction	Houses with Sewer Connections						Houses with Water Connections					
	1960	1970	1980	Percent of Total			1960	1970	1980	Percent of Total		
				1960	1970	1980				1960	1970	1980
Distrito Federal												
Alvaro Obregon	21,411	50,868	95,201	55.0	68.6	77.9	12,868	39,552	75,330	33.0	53.4	61.6
Azcapotzalco	18,325	72,684	106,187	33.4	79.1	91.2	28,715	53,800	81,129	52.3	58.5	69.7
Benito Juarez	N/A	N/A	127,657	N/A	N/A	95.3	N/A	N/A	122,916	N/A	N/A	91.7
Coyoacan	12,381	36,315	86,014	37.4	63.6	73.2	18,299	33,132	82,641	55.2	58.0	70.4
Cuajimalpa	1,436	270	10,488	41.7	5.1	67.9	404	1,772	7,491	11.7	33.2	48.5
Cuauhtemoc	N/A	N/A	183,725	N/A	N/A	92.5	N/A	N/A	168,328	N/A	N/A	84.8
Gustavo A. Madero	63,563	157,547	243,023	61.5	80.7	86.7	33,023	116,147	193,155	31.9	59.5	68.9
Iztacalo	24,059	59,152	95,605	67.8	74.0	91.0	7,604	38,165	71,075	21.4	47.8	67.6
Iztapalapa	24,674	50,422	150,970	56.1	60.1	67.1	12,492	40,148	127,097	28.4	47.8	56.5
Magdalena Contreras	4,198	3,842	21,193	59.4	33.0	68.0	641	3,395	16,268	9.1	29.1	52.2
Miguel Hidalgo	N/A	N/A	108,224	N/A	N/A	92.2	N/A	N/A	92,716	N/A	N/A	79.0
Milpa Alta	659	1,257	2,887	13.4	21.3	30.7	388	1,150	4,429	7.9	19.5	47.1
Tlahuac	2,792	2,273	8,040	50.4	24.3	33.2	223	3,242	11,737	4.0	34.7	48.4
Tlalpan	5,262	13,544	42,791	49.7	61.5	61.4	2,214	11,918	37,352	20.9	54.1	53.6
Venustiano Carranza	N/A	N/A	129,839	N/A	N/A	91.7	N/A	N/A	102,765	N/A	N/A	72.5
Xochimilco	4,580	7,151	22,193	34.9	37.5	56.7	1,486	5,869	23,188	11.3	30.8	59.3
Total (D.F.)	183,340	455,325	1,434,037	21.8	37.3	82.1	118,357	348,290	1,217,617	14.1	28.6	69.7
Estado de Mexico												
Atizapan de Zaragoza	312	3,956	26,806	22.2	54.0	74.0	254	3,839	23,689	18.1	52.4	65.4
Coacalco	128	1,138	15,754	19.1	53.8	89.2	70	1,245	15,548	10.4	58.9	88.0
Cuautitlan	1,227	2,593	4,458	34.7	41.0	65.2	841	2,782	4,133	23.8	44.0	60.5
Cuautitlan Izcalli	N/A	N/A	21,343	N/A	N/A	67.3	N/A	N/A	23,088	N/A	N/A	72.8
Chalco	766	2,495	4,074	14.2	39.0	31.3	749	3,103	7,440	13.9	48.5	57.2
Chicoloapan	45	399	758	4.8	30.4	15.9	38	466	1,191	4.0	35.5	24.9
Chimalhuacan	1,088	255	2,347	8.4	9.0	21.7	962	603	4,385	7.4	21.4	40.5
Ecatepec	441	15,484	109,705	6.0	44.9	84.3	464	13,408	83,143	6.3	38.9	63.9
Huixquilucan	415	1,240	7,531	14.2	24.8	58.2	246	1,129	6,607	8.4	22.6	51.1
Ixtapaluca	767	2,371	6,527	21.0	40.3	51.5	735	2,944	6,777	20.2	50.0	53.5
La Paz	130	1,193	11,839	9.6	13.5	69.9	150	1,304	8,572	11.1	14.8	50.6
Naucalpan	2,775	43,984	108,198	18.1	67.3	80.5	2,460	34,415	85,019	16.1	52.7	63.3
Nezahualcoyotl	53,774	198,102	N/A	N/A	219.3	N/A	N/A	29,158	125,843	N/A	32.3	58.8
Nicolas Romero	616	2,456	6,390	11.1	31.5	32.9	678	1,986	6,754	12.2	25.5	34.8
Tecamac	129	640	7,108	5.8	18.5	47.6	174	975	7,543	7.9	28.2	50.6
Tlalnepantla	5,945	39,115	111,064	33.6	64.8	84.9	5,709	31,047	93,588	32.2	51.4	71.6
Tultitlan	135	4,427	14,178	4.9	54.8	59.1	97	4,320	16,398	3.5	53.4	68.4
Total (State)	68,693	319,848	458,080	82.0	101.3	55.1	13,627	132,724	519,718	16.3	42.0	62.5
Total MAMC	252,033	775,173	1,892,117	27.2	50.5	73.4	131,984	481,014	1,737,335	14.3	31.3	67.4

SOURCES: Garcia Peralta, B., 1988. "Situacion de la vivienda en la Zona Metropolitana de la Ciudad de Mexico," Table 6.17, in "Atlas de la Ciudad de Mexico," El Colegio de Mexico, Mexico.
Total housing stock for calculating percentages with sewer and water connection, from Table 13.

Table 20

Houses with Sewer and Water Connections in MAMC by Geographic Region (1960-1980)

Jurisdiction	Houses with Sewer Connections						Houses with Water Connections					
	1960	1970	1980	Percent of Total			1960	1970	1980	Percent of Total		
				1960	1970	1980				1960	1970	1980
Distrito Federal												
North	81,888	230,231	349,210	51.7	80.2	88.0	61,738	169,947	274,284	39.0	59.2	69.1
South	25,674	60,540	161,925	38.1	53.4	62.3	22,610	55,311	159,347	33.6	48.8	61.3
East	48,733	109,574	376,414	22.2	33.6	79.8	20,096	78,313	300,937	9.1	24.0	63.8
West	27,045	54,980	235,106	16.1	25.9	82.1	13,913	44,719	191,805	8.3	21.1	67.0
Center	0	0	311,382	0.0	0.0	93.6	0	0	291,244	0.0	0.0	87.6
Total (D.F.)	183,340	455,325	1,434,037	21.8	37.3	82.1	118,357	348,290	1,217,617	14.1	28.6	69.7
State of Mexico												
North	263	5,565	29,932	7.7	54.6	71.9	167	5,565	31,946	4.9	54.6	76.7
NW	8,100	48,120	170,061	28.7	58.8	75.6	7,482	39,654	151,252	26.5	48.5	67.2
NE	570	16,124	116,813	5.9	42.5	80.5	638	14,383	90,686	6.6	37.9	62.5
West	3,190	45,224	115,729	17.5	64.3	78.6	2,706	35,544	91,626	14.8	50.5	62.2
East	56,570	204,815	25,545	233.2	177.2	9.4	2,634	37,578	154,208	10.9	32.5	56.6
Total (State)	68,693	319,848	458,080	82.0	101.3	55.1	13,627	132,724	519,718	16.3	42.0	62.5
Total (MAMC)	252,033	775,173	1,892,117	27.2	50.5	73.4	131,984	481,014	1,737,335	14.3	31.3	67.4

SOURCES: Processed from Table 19. See Table 3 for description of geographic areas.

The private housing sector

The private housing sector has moved upmarket over the last four decades. Its share of total housing stock has decreased from one-third in the 1950s, to less than 15 percent in the 1980s (Schteingart and Garza, 1976; Schteingart, 1988). The private housing supply has moved from a predominantly multi-family rental housing market, for middle- and low-income groups, to a predominantly single-family ownership housing market, for upper-middle- and high-income groups. These changes can be traced to the different historical periods in Mexico City's development.

Before Mexico City underwent a rapid expansion (1938-42), investment in multi-family rental housing was 86 percent higher than investment in privately-owned housing (Gonzalez Salazar, 1983). Most of Mexico City's population was living in a relatively limited area. Until the first part of the 1940s, 60 percent of the D.F. population was living in centrally-located housing tenements or old housing buildings.

After the 1948 rent control ordinance, which froze most rents in central locations, the housing industry shifted away from rental housing to ownership housing.¹⁸ The investment in directly owned housing stock accounted for 83 percent of total private investment in housing during the 1940-56 period (Gonzalez Salazar, 1983). The rather unattractive financial conditions in the rental-housing market (i.e. high taxes, low profit margins, restrictive rent control laws, etc.) led to a sudden drop in the supply of rental housing. The rental housing stock consistently declined from 82 percent of the total housing stock in 1960, to 57 percent in 1970, and 36 percent in 1980. This decline contrasts with the sharp increase in the ownership housing stock, which in the 1970-80 decade increased by 152 percent, compared to the 5 percent increase in the rental housing stock during the same period.¹⁹

Along with the increase in ownership housing of the last three decades, a change in the geographical distribution of private housing has occurred. Since the 1954 ban on new subdivisions in the D.F., the municipalities surrounding the D.F. have attracted real estate and housing investors to highly desirable suburban locations. A large number of single-family high- and medium-income residential subdivisions were developed in the western and northwestern fringes of the city. Later in the 1970s, new authorizations for residential subdivisions were allowed in the D.F., driving residential growth towards the southern and southwestern portions of the D.F.²⁰

The high demand for private housing units in the 1970s, coupled with sharp increases in land prices and serious problems of land supply, led to rapid urban expansion and higher urban densities in the areas adjacent to the city center (within eight kilometers). Most of the growth, however, was channeled through horizontal expansion. The construction of apartment buildings in the intermediate ring served only a small portion of the private housing market, given the financially restrictive conditions involved in high-density construction (i.e. higher land and construction costs, etc.).

The private housing sector has been, without a doubt, a significant actor in housing delivery in the metropolitan area. However, it has not been able to maintain the high profile it held in the postwar period.²¹ The shift from rental housing to ownership housing, and from a central to suburban location, has greatly benefitted the upper segments of the housing market, forcing large sectors of the lower-income urban population to depend on a limited set of options, including public housing and popular-sector housing.

The public housing sector

The public sector has increased its role in the production of new housing from 5 percent of the total new housing supply in the 1950s, to 9 percent in

the 1960s, and 18 percent in the early 1970s (Schteingart and Garza, 1978). If we look at the production of public housing and the total population served by this sector during the 1970s and 1960s, we notice some significant quantitative improvements. The production of housing increased from 93,000 units in the 1960s (Schteingart and Garza, 1978), to 179,000 units in the 1970s (Gonzalez Salazar, 1983). However, if we look at the 1960 and 1970 housing deficits, 533,520 units and 880,540 units respectively (Schteingart and Garza, 1978), it is clear that the public housing sector covered only a small portion of the housing deficit (17 percent of 1960 deficit and 20 percent of 1970 deficit), even though the production of housing almost doubled. If we look at the total population served by the public sector (510,000 in the 1960s and 890,000 in the 1970s) as a percentage of total population increase during the two decades, we see that the percentages remained almost constant, 18 percent and 20 percent respectively.

Public housing has gone through some changes in the types of housing promoted, as well as in the forms of promotion. Until 1963, the production of public housing was oriented towards a rental market. The beneficiaries of the housing projects were mostly public officials enrolled in social security or public health programs (i.e. ISSSTE, IMSS, etc.), or government workers affiliated with some administrative unit.²² The most representative housing project built during this period was the Nonoalco-Tlatelolco housing project. The average annual production of public housing during this period was 3,400 housing units.

In 1963, with the establishment of the Programa Financiero de la Vivienda (PFV), public housing shifted towards the production of housing for private ownership. The PFV created for the first time a trust fund within the Banco de Mexico -- the Fondo de Operacion y Descuento Bancario a la Vivienda (FOVI) --

which channelled private, federal, and foreign funds for public housing. In 1964, the U.S. AID, the Inter-American Development Bank, and other foreign lenders provided the initial capital to initiate housing programs. FOVI directed 30 percent of its funds towards underwriting mortgages originated by private financial institutions.²³ The public housing activities in this period were broader than in the previous decade, with a total of 92,000 housing units promoted by the PFV during the 1964-1970 period. This program reached a population that had previously not had access to public housing, especially middle- and middle-low-income classes. The annual average production of housing during this period was 20,800 housing units (Garza and Schteingart, 1978).

The 1970s provided a greater participation of the public sector in the production of housing. The most significant change in housing policy was the creation of a National Housing Fund--the Instituto del Fondo Nacional de la Vivienda para los Trabajadores (INFONAVIT)--which collects directly from all private employers in the nation a percentage of the employees' salary for the construction of housing.²⁴ The creation of the fund was the first nationwide policy addressing the working class's needs for public housing, and the first government policy to require all private employers in the nation to contribute to the construction of housing for the workers. In previous stages, financial resources for public housing came exclusively from government funds and international borrowing, and did not address a housing market other than that addressed under specific government programs. A large percentage of the housing credits was geared towards workers with incomes between one and three times the minimum salary.²⁵

The housing credits granted through the INFONAVIT fund favored, to a large extent, the metropolitan area of Mexico City--57 percent of the total

contributions came from private employers located in the metropolitan area, and 44 percent of the total credits extended during the first years of the program were directed to Mexico City. Overall, one-third of the total INFONAVIT investment, and one-third of the total dwelling units built through INFONAVIT credits, were located in Mexico City.

During the 1970-80 period, INFONAVIT funded the construction of 81,825 housing units (11,700 annually), representing 45 percent of total public housing activity in that period (Gonzalez Salazar, 1983, Table 11). The second-largest promoter of public housing was the Direccion General de Habitacion Popular (DGHP-DDF), with 46,679 units (26 percent), following FOVISSSTE and BANOBRAS.

During the first half of the 1980s, INFONAVIT continued with the same level of production, roughly 11,100 housing units per year.²⁶ Overall, a total of 123,000 units was produced by the public housing sector in five years (1980-85). The total population housed by public housing during that period was 688,800 people, which accounts for 29 percent of the total increase in population in the MAMC (2,341,225 people in the 1980-85 period).

During the two years after the Mexico City earthquake of September 1985, a large housing program was launched by Mexico City's authorities with World Bank funds. This program, called Programa de Renovacion Habitacional, included the construction of more than 50,000 housing units allocated to families that were affected by the earthquake.

One of the main critiques of public housing in Mexico City has been its almost exclusive emphasis on finished housing based on capital-intensive construction methods. The beneficiaries of public housing have therefore been a reduced segment of the working class, leaving the larger segments of the

population practically unattended. Progressive housing, home improvement, and site and service programs have not been part of the public housing agenda.

The popular housing sector

The popular housing sector is a residual category generally used to define a housing stock that develops through informal means, and which relies on the household economy and self-help construction methods. This sector has been the fastest-growing housing sector; it has provided over 65 percent of the new building stock in the past three decades (Schteingart and Garza, 1975; Aguilar Mejia, R., 1982). In spatial terms, the popular housing sector grew from 23 percent of the total build-up area in 1952 to 41 percent in 1970 (Ward, 1981b). Today, 65 percent of the total housing stock in the metropolitan area is considered to be part of the popular housing sector (Pezzoli, 1987, p. 378).

The two basic conditions that characterize the popular housing are (1) the informal/illegal acquisition of land,²⁷ and (2) the reliability on self-help construction methods and on informal access to infrastructure services and construction materials.

The housing typologies available for the popular housing sector (Bazant, 1978; Ward, 1977) indicate a wide variety of housing types which develop at different historical periods. The first popular housing developed in the 1940s and 1950s in the intermediate ring, and involved illegal subdivisions, land invasions, and squatter settlements or shack-yards (ciudades perdidas). These patterns continued well into the 1970s, although they extended to outlying areas in the urban fringes.²⁸

The popular housing sector is still representing a viable alternative to many urban residents who cannot find other means of accessing the formal land and housing market. The development patterns of this sector, however, have changed in the last few years. Although the settlement pattern is still

characterized by illegal land acquisition and (either through land invasions or through illegal sales of property titles) self-help construction, there have been some changes in the types of residents and the scale of the settlements. While the popular settlements in the 1970s were started with massive land invasion, involving new residents that had just arrived from the countryside, the popular settlements of the 1980s are taking place more gradually and involve urban residents that have had to move from other locations in the city (Aguilar, A., 1986). Areas such as Chalco, Ixtapaluca, and Tlalpan are now developing under improvised popular housing schemes, which result from massive intra-urban migration.

Conclusions

This paper has examined aspects related to population growth, land use patterns, and housing activities in Mexico City, focusing mainly on their historic and geographic evolution during the second half of this century. From this analysis several conclusions can be derived:

1. Although population growth rates in the metropolis have consistently declined during the past decades, some areas still maintain high rates of growth, notably the southern portion of the D.F., and the northern, eastern, and southeastern portions of the State of Mexico's municipalities. The patterns of development that characterize these growing areas respond to differences in socio-economic structure, environmental conditions, and levels of infrastructure services. Lower-income groups tend to grow faster, occupying lands that are unsuitable for development and lacking basic infrastructure, a typical example being the eastern municipalities. Middle- and high-income groups are growing at a slower pace, occupying more desirable locations and enjoying higher levels of infrastructure services.

2. Rapid population growth has been accompanied by an accelerated process of land conversion from rural to urban uses. The relatively moderate urban densities that characterize urban development in Mexico City, and the saturation of urban areas, have triggered an horizontal expansion which has reached agricultural and forest lands in the urban fringes. Growth in the peripheries has been accompanied by legal mechanisms to convert agricultural lands--generally under collective land ownership--into urban uses. Two interrelated mechanisms--land regularization of illegally appropriated lands and land expropriation of undeveloped lands--have been used to accommodate demands from different sectors in areas where land tenure conflicts exist. Land regularization has mostly benefitted the popular informal sectors, by granting them formal access to areas which had been illegally appropriated. However, land regularization has also contributed to the growth of private land markets which had previously been restricted by agricultural land tenure.

3. Besides the rapid, and to a large extent uncontrolled, growth in the peripheries, the city is currently undergoing a process of land re-utilization and urban saturation in central and intermediary locations. Land reserves planned for specific uses are being set aside by the authorities, much of it assigned for residential uses. These land reserves, however, could accommodate only a small portion of the population growth expected in the next few years.

4. The housing needs generated under such a rapid process of urbanization have been met by three sectors: the private housing sector, the public housing sector, and the popular housing sector. The private sector has decreased its share to less than 15 percent of the total housing stock in this decade. Within this sector, investment has shifted from rental housing to ownership housing, and from central to peripheral locations. This has

benefitted the upper segments of the housing market and forced the lower segments into alternative solutions within the public and popular sectors.

5. The public housing sector increased its role in the production of new housing in the 1970s, reaching 18 percent of total supply of housing in the city. The public sector, however, covered only a small portion of the accumulated housing deficit, and served a limited segment of the total population increase during that period. The emphasis on finished housing for the salaried worker--generally the upper tiers of the working class--has limited the ability of the public sector to assist broader segments of the population.

6. Popular housing is the most common form of housing. It includes the housing stock that develops through informal means and which relies on the household economy and self-help construction methods. This is the fastest-growing housing sector, providing more than 65 percent of the housing stock in the city. Much of this housing type is occupied by migrants flowing into the city, and more recently by urban residents who have moved from other locations in the city as a way to access land.

¹The MAMC includes an area of 352,000 hectares distributed in two geo-political units: the D.F. (Distrito Federal), the national capital, which contains sixteen delegations covering an area of 150,000 hectares; and the seventeen municipalities of the State of Mexico which surround the D.F. to the north, west, and east, and which cover an area of 201,866 hectares (Map 1).

²It is estimated that, during this decade, 85 percent of the total population growth in the municipalities was due to migration (Contreras Suarez, E., 1978, Table II.6).

³Population growth due to migration in the municipalities continued above 85 percent of total population growth.

⁴The ejido and communal type of land ownership emerged during the post-revolutionary period (1930s and 1940s) as a result of massive land distribution programs. Legal rights to the land were distributed to peasants (ejidatarios), who could keep control of the land, but could not sell it or rent it to anybody. In the case of the communal lands, the communities that had been under the control of the old haciendas were given full rights to their lands. The ejido and communal lands are formally represented by collective organizations (associations) (Comisariados Ejidales and Juntas

Comunales) which are formally controlled and regulated by the agricultural sector within the government.

- ⁵As of 1981, 73 percent of the total area in the southern delegations in the D.F. were under collective land ownership, and some of its fastest-growing delegations (Tlalpan and Magdalena Contreras) have more than 80 percent of their total territory under ejido land tenure (D.F., 1981). This suggests that much of the future growth will continue to take place on public lands.
- ⁶It is calculated that a total of 67,510 hectares were incorporated into the urban areas in the 1940-75 period. Fifty-eight percent of this growth took place on public lands (ejido, communal, and state lands), and 42 percent on private lands. In the municipalities the proportion of public lands as a percentage of the total area incorporated into urban uses was 77 percent during that period. In the D.F. this proportion was smaller (53 percent) (Tables Iracheta, 1983).
- ⁷Residents must pay for their property titles, even though they had previously paid a land acquisition fee to informal/illegal promoters. The price paid by residents for their land is set by an independent commission.
- ⁸The amount of compensation to be paid to ejidatarios for the loss of their land is fixed at twice their agricultural value plus 20 percent of the profits gained from land sales to the residents of legalized settlements (Varley 1987, p. 470).
- ⁹According to Iracheta (1983), 40 percent of the expropriated ejido lands in the municipalities ended up as middle- and high-income residential developments. A good example of highly profitable ventures on previously expropriated lands is the residential development Cuautitlan Izcalli, built on land which was originally expropriated for a public housing project, and later sold to private promoters.
- ¹⁰One such agency is AURIS (The Institute of Urban Action and Social Integration) in the State of Mexico.
- ¹¹As is stated officially, CORETT activities are limited to diverting illegal urban growth into legal, controlled channels (Diario Oficial, 11/8/74, in Varley 1987); in no case have CORETT expropriations in Mexico City ever included an unoccupied area for land reserve (Varley, 1987)].
- ¹²A political interpretation of land regularization is presented by Sabatini and Fuchs (1985, cited by Pezzoli, pp. 385), who argue that regularization is aimed at demobilizing groups of organized colonos, which are a political threat because of their tendency toward independence from the PRI's dominant power structures. This seems to contradict the idea that the state has been successful in co-opting popular sectors and creating new clientele.
- ¹³Between 1960 and 1977, 9,000 hectares of ejido land--which accounts for 36 percent of the urban growth in the municipalities--were expropriated and then sold to private developers for the development of new "fraccionamientos" (Iracheta, 1983).
- ¹⁴These thresholds are calculated on the basis of 150 inhabitants/hectare for the lower threshold (based on the current average in the D.F.), and 400 inhabitants/hectare for the higher threshold (based on the highest density proposed in the plan).
- ¹⁵This was calculated with a projected population of 10,008,997 in 1986 and 10,652,898 in 1990, at an annual rate of 2.1 percent. The total population increase in the D.F. for the period 1986-89 is 643,901.
- ¹⁶The projected population is 6,549,335 for 1986 and 7,581,674 for 1989, calculated with a 5 percent annual rate of growth. The total population

increase is 1,032,339. Iracheta assumes an average of 187 inhabitants/hectare. Although population densities in the municipalities tend to be lower than the standards used here (less than 100 inhabitants/hectare in many municipalities), our calculation assumes higher densities for the future.

- ¹⁷Of the total 3,202 hectares, 36 percent are ejido land and the rest are private lands. 75 percent of the land reserves that belong to the ejido land is still in process of being acquired; only 13 percent of the land reserve that belongs to private owners still needs to be acquired (Iracheta, 1983, Table 7).
- ¹⁸Leases of less than 3,000 pesos were frozen. These rent control laws were viewed as a concession towards the labor sector; rent controls were viewed as an effective mechanism to control inflation in a period of rapid economic growth. This measure, however, represented a blow to the real estate sector (Connolly, 1982).
- ¹⁹To the new ownership housing stock produced in new suburban locations, one should add a stock of favorably-located apartment units which were converted into condominiums.
- ²⁰In 1977 alone, 35 "fraccionamientos" were authorized in the D.F.
- ²¹Between 1940 and 1956, the private sector served 94 percent (1.5 million people) of the total population housed in new construction. Although this accounted for only 50 percent of total population increase in the 1940-60 period, we can still consider this to be quite high.
- ²²The main agencies engaged in housing production were : Direccion General de Pensiones Civiles y de Retiro (predecessor of ISSSTE), Banco Nacional de Obras y Servicios Publicos, Instituto Nacional de la Vivienda, Instituto Mexicano del Seguro Social, and Departamento del Distrito Federal.
- ²³The allocation was as follows: 7.5 percent for households of one minimum salary (5 percent downpayment, 15 years' mortgage period, at 6 percent interest rate); 15 percent for households exceeding the minimum salary (10-15 years, 9-10 percent interest rate); and 7.5 percent for private promoters (Schteingart and Garza, 1978).
- ²⁴Article XII of the Mexican Constitution requires employers to put 5 percent of the wages paid to workers in the housing fund, excluding government workers, sportsmen, and house workers.
- ²⁵By 1976, 87 percent of the credits were directed to workers earning between one and two times the minimum salary.
- ²⁶This figure was calculated in the following way (according to Sela Polo, M., 1984): From the total of 474,891 "lodging actions" carried out by INFONAVIT from 1972 to 1984, 85 percent (or 403,657) were actions involving the acquisition of property in ownership and lodging whose construction has been coordinated and financed by INFONAVIT (technically termed "line 1" actions). If 33 percent of this total were built in Mexico City, then we have a total of 133,207 units, or 11,100 per year.
- ²⁷Informal/illegal acquisition of land could be done in different forms--for instance, through illegal subdivisions of land in which subdividers who are not owners sell plots of land in an informal land market. It could also be done through land invasions, in which individual settlers take control over a portion of land and start building until the house is gradually improved.
- ²⁸Ward (1977) analyzes three squatters which were created in different periods and which have achieved a different level of consolidation (Sector Popular, 1947; Isidro Favela, 1960; and Santo Domingo de los Reyes, 1971), the last

two of which are located in the southern intermediate ring. Bazant (1978) develops a typology of three divisions popular-sector housing with their respective examples: Squatters, or "Ciudades Perdidas" (Buenos Aires, the heart of a block with 1150 people by 1973); old housing compounds which originated with squatters and land invaders (Pro-Hogar, with 1,860 lots in 66 hectares, and Vellejo, with 1,800 lots in 90 hectares); and new housing compounds (Jalalpa, with 450 lots in 18 hectares; Lomas San Agustin, with 1,500 lots in 50 hectares; and Netzahualcoyotl, with 137,000 lots in 4,000 hectares).

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