



**Modeling the Changing Urban Landscape of a Latin American City: Lessons from the Past and Considerations for the Future of Metropolitan Panama City**

**by**

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## Introduction

During the last several decades, an unprecedented rate of urbanization and population growth has taken place in Latin American countries. Along with urbanization, various forms of social organization have emerged and they have become manifested in the spatial configuration of Latin America's cities and their social spatial structures (Gilbert 1993; Hardoy 1975, 85; Lowder 1986, 1993; Armstrong and McGee, 1985; Sherstha 1992).

In this paper, one experience of Latin American urbanization is portrayed through examination and modeling of the changes taking place in the socio-spatial configuration of Metropolitan Panama City (MPC). The paper shows that by the end of the twenty century, spatial patterns resulting from the residential distribution of status groups in MPC remain similar to those of the Colonial Panama City. The central business district houses the upper class at the center of the city and the middle and lower classes are located on the periphery. The paper also shows that such patterns have persisted during the most recent decades although important transformations have occurred in the geographic distribution of population within MPC.



A review of the literature is offered first in order to identify and model stages in the formation of MPC's spatial structure. Secondly, spatial patterns of population distribution and redistribution and of status groups allocation will be examined for the most recent decades. Finally, developments regarding availability of land and new transportation networks will be modeled and analyzed in relation to the changing patterns of human settlement in MPC. It is

suggested that these new developments require research initiatives that inform urban planning and policy and promote increasing public awareness and participation. It is also suggested that the production of and access to accurate spatial data is needed in order to model and predict change, facilitating a more efficient urban reengineering process.

Findings from this study advice the production and availability of housing and demographic data aggregated at smaller levels of geography than that of neighborhoods (barrios). Direct observations by this author suggest that there are variations within barrios that could reveal a more complex distribution of status groups across the urban spectrum than what has been reported using available data. There are, for instance, sub-areas within barrios of the periphery presenting housing characteristics similar to those found in barrios of higher socioeconomic status. In addition, the barrios' total population range between 9,000 and 119,000 people approximately. This level of aggregation limits accurate identification and measurements of patterns of spatial separation of population characteristics across the urban landscape.

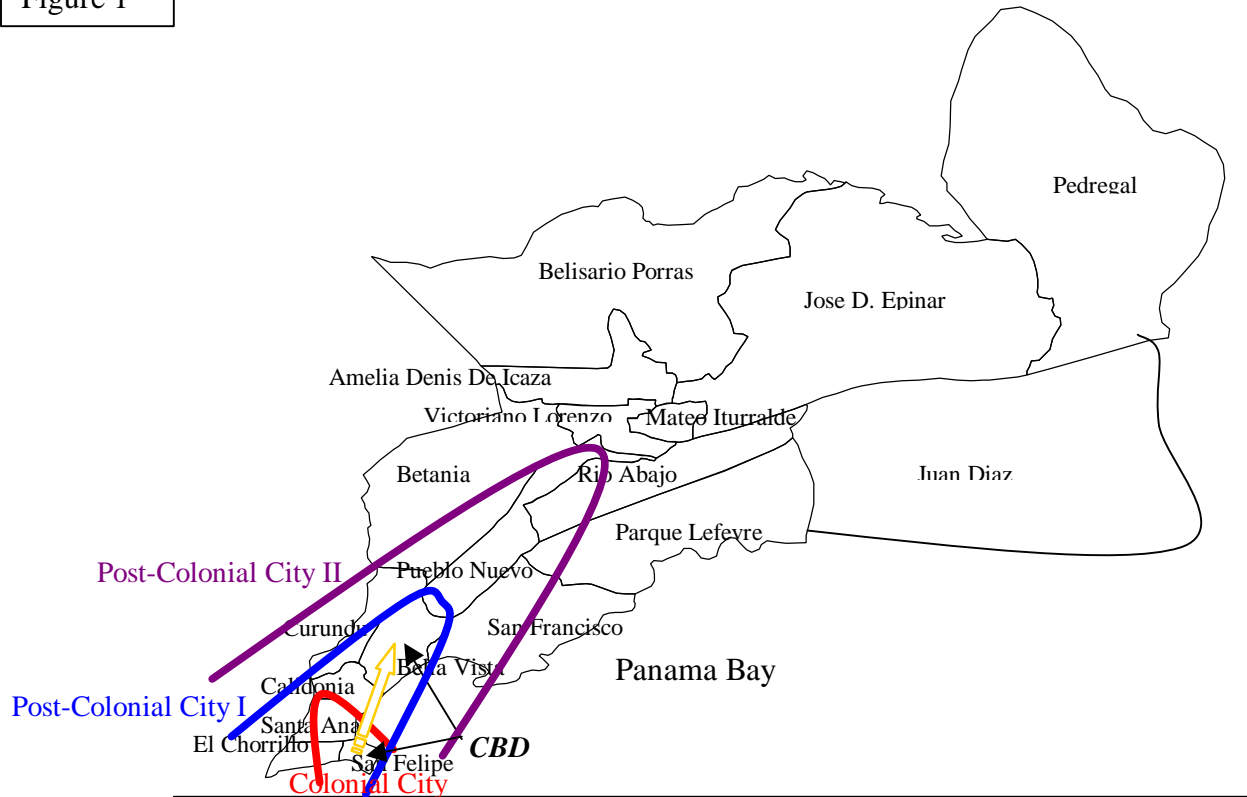
### **Lessons from the Past: The Formation of Metropolitan Panama City**

Similar to other countries within the Latin American region, rural-to-urban migration has been the leading demographic factor accounting for Panama's urban growth. Studies on internal migration in Panama revealed that from 1950 to 1970 more than two-thirds of all migrants went to the Province of Panama, whose service economy contained the principal economic activities of the country (Gandasegui 1980). Studies also revealed that during that period the Districts of Panama and San Miguelito--which conform Metropolitan Panama City (MPC)--absorbed most of the immigration flows to the Province of Panama. Most studies of Panama's internal migration have explained this phenomenon as a result of the extreme poverty in rural areas, which forces people to go to the city looking for better living and economic conditions.

However, previous results have shown that these migrants often locate in extremely poor urban areas, commonly called slums or squatter settlements (Fraizer 1976; Gandasegui 1980; Leis 1979). Although more recent studies (Varela 1998) revealed changing patterns of human settlement in the Republic of Panama, the Province of Panama continues to be the principal area of attraction for most rural to urban migrants in Panama. In addition, MPC houses 61 percent of the province's population.

Previous analysis on the formation of Panama City and its surrounding metropolitan area (Uribe 1989) informs on how economic and political factors had an impact on the formation of

Figure 1



MPC's spatial structure and its residential development. Following previous research on Panama, existing characterizations of colonial and post-colonial cities in underdeveloped countries (Shrestha 1992), and based on the present study's modeling of the spatial distribution of status groups in MPC, I identify three stages in its formation.

Until early this century Panama City preserved its colonial structure. The Central Business District (CBD) housed the upper class and the middle and lower classes were located on the periphery conforming thus, the Colonial City of Panama City. However, during the construction of the Panama Canal a Post-Colonial City of Panama City developed when the upper class moved to suburban areas far from the increasing concentration of working class populations. Once the construction of the canal ended, a second post-colonial city emerged when jobless people--those unable to afford the high prices of the city renting housing system--were forced to locate beyond the suburbs of the residential elite. Such change placed the urban

elite at the center of the city and recreated the social spatial structure of the colonial city. Such structure has remained since then.

### **The Colonial City of Panama City**

Panama City, like most colonial cities, "served primarily as commercial entrepôts—points of distribution linking the colony with its colonizing country" (Shrestha 1992:49). These cities have been defined as

"agents of European imperialism, facilitating trade penetration and acting as gateways for the export of primary products (from the colony) and the import of manufactured goods (into the colony)" (Ibid.).

Since its conquest by Spain in 1501, the Republic of Panama, particularly Panama City, has been a very important center of transit of products and persons. Panama City served

"as a land bridge and transit zone between continents and oceans...Following their arrival in Panama...the Spanish turned Panama into a principal crossroad and marketplace of the great Spanish Empire" (Meredith and Hanratty 1989:xxiii).

The "Ferias de Portobelo" (Fairs of Portobelo) were the first expression of this situation. This was followed by the construction of the "Camino Real" (Real Road) which was designed by the conquerors to transport gold and silver from South America to Spain. The discovery of gold in California in 1848, and the necessity of the United States to transport this valuable product, resulted in the construction of a railroad by the United States in 1855 that crossed the isthmus of Panama.

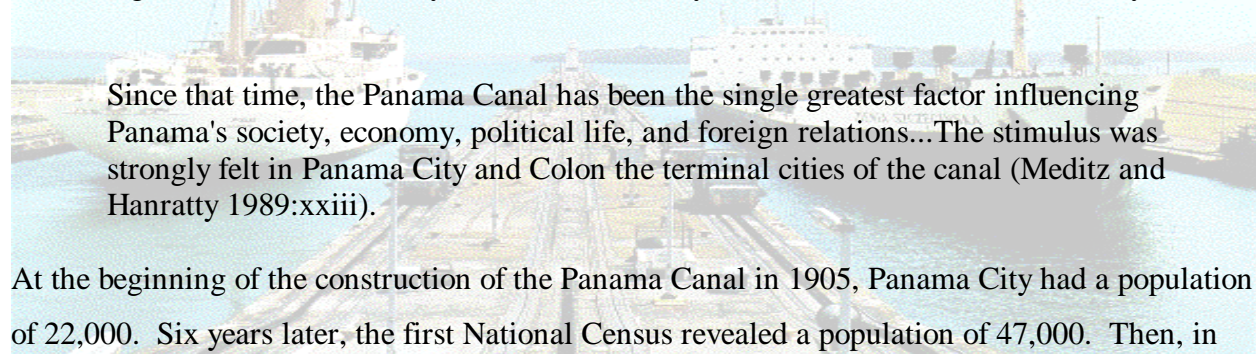
This event marked the beginning of a progressive evolution in the increase of the population of Panama City. Before the construction of Panama's railroad, the population of Panama City was less than 5,000 inhabitants. However, due the railroad's construction first and then the construction of the France Canal the population of Panama City increased to 24,000 in 1884.

Panama City presented a land use pattern imposed by the colonial ruler and then adopted by the dominant class after the independence from Spain. This pattern characteristic of most cities in underdeveloped countries was expressed through a residential use of space "characterized by segregation along both ethnic and socioeconomic lines" (See Shrestha 1992:50 for patterns in underdeveloped countries). In Colonial Panama City, the San Felipe

neighborhood, also called "el intramuros" (inside the wall), contained the Central Business District (CBD) and housed the upper class. Next to San Felipe, on the periphery the Santa Ana neighborhood, also called "el arrabal" (outside the wall), housed the middle and lower classes (See Figure 1).

### **The Post-colonial City I**

Fifty-nine years after the construction of the railroad, and thirty years after the fiasco of the France Canal, the construction of the Panama Canal in 1914 determined not only the future and configuration of Panama City, but also the destiny and function of the entire country.



Since that time, the Panama Canal has been the single greatest factor influencing Panama's society, economy, political life, and foreign relations...The stimulus was strongly felt in Panama City and Colon the terminal cities of the canal (Meditz and Hanratty 1989:xxiii).

At the beginning of the construction of the Panama Canal in 1905, Panama City had a population of 22,000. Six years later, the first National Census revealed a population of 47,000. Then, in 1920, six years after the end of the construction of the canal, Panama City reached a population of 59,500.

This fact generated the urban expansion of the city and created various new low income renting neighborhoods such as El Chorrillo on the periphery of the arrabal, whose inhabitants were mainly the workers of the canal. Later, a new sub-urban area named "La Exposicion" and later expanded to "Bella Vista" was created to house the upper class, who abandoned the intramuros (San Felipe). This event, especially unusual in Latin American cities, generated a change in the distinctive land use pattern imposed by the colonial ruler. It was now locating the urban elite's residential areas in the suburbs (See Figure 1). These areas also started to assume some of the CBD's functions (Uribe 1989:20).

### **The Post-colonial City II**

The end of the construction of the Panama Canal in 1914 generated a large number of jobless workers. They did not have the economic resources to afford the rent of the houses on the arrabal and its periphery. Thus, they were forced to settle in rural areas very far away from the city and far from the new upper class suburban neighborhood. These neighborhoods were

Pueblo Nuevo and Rio Abajo, 10 kilometers from the northeast of the CBD, and Juan Diaz, 20 kilometers to the northeast.

The formation of these new suburbs--occupied by low income and jobless people--was the beginning of the creation of a new land-use pattern similar to that of the colonial city. It was placing the poor on the periphery of the city. This new pattern extended the poor far from the high-income neighborhood. This pattern of urban expansion has been explained by urban scholars as the landlords' influences in the government decisions to supply basic services to these new settlements. The main objective of the landlords' action was to urbanize without any cost to their properties located between the new squatter settlements and the CBD (Uribe 1989).

Later, the expansion of the Canal in 1936 and the works realized in order to warranty its military defense generated a new demand of labor force and economic activity. As a result Panama City experienced a peak not only in the generation of new jobs opportunities and economic activities, but also in the increase of its population. After 1936, Bella Vista--which housed those in the upper class-- continued assuming functions of the CBD and new suburbs also appeared, some as far away as the working class neighborhood of Pedregal and others as close to the CBD as the middle class neighborhood of San Francisco de la Caleta.

The rapid population growth resulted in an expansion of the suburbs and the formation of new low income urban neighborhoods such as Rio Abajo, and the middle income neighborhood of Betania. The construction of the Carretera Transistmica (Boy-Roosevelt road) also took place facilitating the development of new low-income neighborhoods such as Juan Diaz (Uribe 1989: 64). Thus, by 1940 the Post-Colonial City II had developed with a dynamic but well defined social spatial structure similar to the colonial city. It is with Bella Vista at the center of the city housing the upper class and increasingly assuming functions of the CBD (See Figure 1).

### **Recent Patterns of Population Distribution and Redistribution in MPC**

The service function of Panama's economy and the concentration of its economic activities in one specific geographic area--the adjacent territory of the Panama Canal-- (Gorostiaga 1984, Jovane 1975, Meditz and Hanratty 1989) generated a continuous population shift to MPC. The progressive formation of an International Services Platform--with the creation of the Colon Free Zone in 1950 and the installation of an International Financial Center in 1970 in Panama City--supported and reinforced this tendency (Gorostiaga 1984).

The Province of Panama has a geographic total size of approximately 11,887.4 square kilometers, while the MPC represents only 156.5 square kilometers. In contrast, the total population of the Province of Panama, according to the 1990 National Census, is 1,072,127 inhabitants while the population of the MPC is 656,530. Thus, 61 percent of the inhabitants of the Province of Panama (the only urban and most populated province of the country) reside in MPC. In some areas of MPC, the population density reaches 20,564 inhabitants per square kilometer. This contrasts sharply with the province average population density of 90.2 inhabitants per square kilometer.

MPC's growth has been mainly explained by the existence of a strong rural to urban migration process. The district of San Miguelito, a slum community and then a district created in 1970 as part of the MPC and considered to be the most important urban destination for most rural migrants during the 1960s and 1970s (Gandasegui 1980, Leis 1979) houses the barrios of Amelia D. De Icaza, Belisario Porras, Jose D. Espinar, Mateo Iturralde, and Victoriano Lorenzo. These barrios located on the northern periphery of MPC and integrated to MPC's urban structure constitute new developments of the last three decades and constitute today's some of the most populated barrios of Panama.

Figures 2 and 3 contain information on the changes in the population distribution and population density in MPC during the most recent decades. In Figure 1 it can be observed that from 1970 to 1990 a shift in the distribution of population took place from the center to the periphery of MPC. While all barrios of the center and most of its adjacent experienced a decrease in their share of population, most barrios of the periphery experienced growth.

While Calidonia located near the center of the city was the most populated barrio housing 10 percent of the MPC's total population in 1970, by 1990 its share had decreased to 3.4 percent. On the other hand, while Belisario Porras located at the periphery of the city represented only 3.5 of the total population in 1970, by 1990, its share had grown to 18.5 percent. Belisario Porras was already the most populated barrio of MPC in 1980. Juan Diaz also located on the periphery experienced a similar pattern. In 1990 Juan Diaz was the second largest barrio of the MPC. In short, data in Figure 2 shows a fairly steady decrease in the proportion of the population that resides in or near the center of MPC and a steady increase in the proportion of the population that occupy the barrios of the periphery.

Figure 2.

**Percent Population Distribution in Panama City by Barrio, 1970, 1980, and 1990**

Barrio	Year		
	1970	1980	1990
San Felipe	3.2	2.1	1.5
El Chorrillo	6.4	4.5	2.6
Santa Ana	7.5	4.9	4.1
Calidonia	10.5	4.9	3.4
Curundu	3.1	3.2	2.8
Betania	9.1	8.2	7.2
Bella Vista	6.3	4.9	3.7
Pueblo Nuevo	4.7	3.9	3.3
San Francisco	8.7	6.4	5.2
Parque Lefevre	7.6	6.3	5.9
Rio Abajo	6.3	5.7	4.9
Juan Diaz	6.0	9.7	11.4
Pedregal	3.6	6.1	6.3
Amelia Denis De Icaza	4.2	4.5	5.3
Belisario Porras	3.5	14.9	18.5
Jose D. Epinar	2.6	4.4	9.1
Mateo Iturralde	2.9	2.3	2.1
Victoriano Lorenzo	3.6	3.2	2.7
Total %	100.0	100.0	100.0
Total Population	(406,066)	(534,970)	(645,380)

Sources: Panama, Directorate of Statistics and Census, Censos Nacionales de Poblacion y Vivienda: 1990, Distrito de Panama.  
 Panama, Directorate of Statistics and Census, Censos Nacionales de Poblacion y Vivienda: 1990, Distrito de San Miguelito.

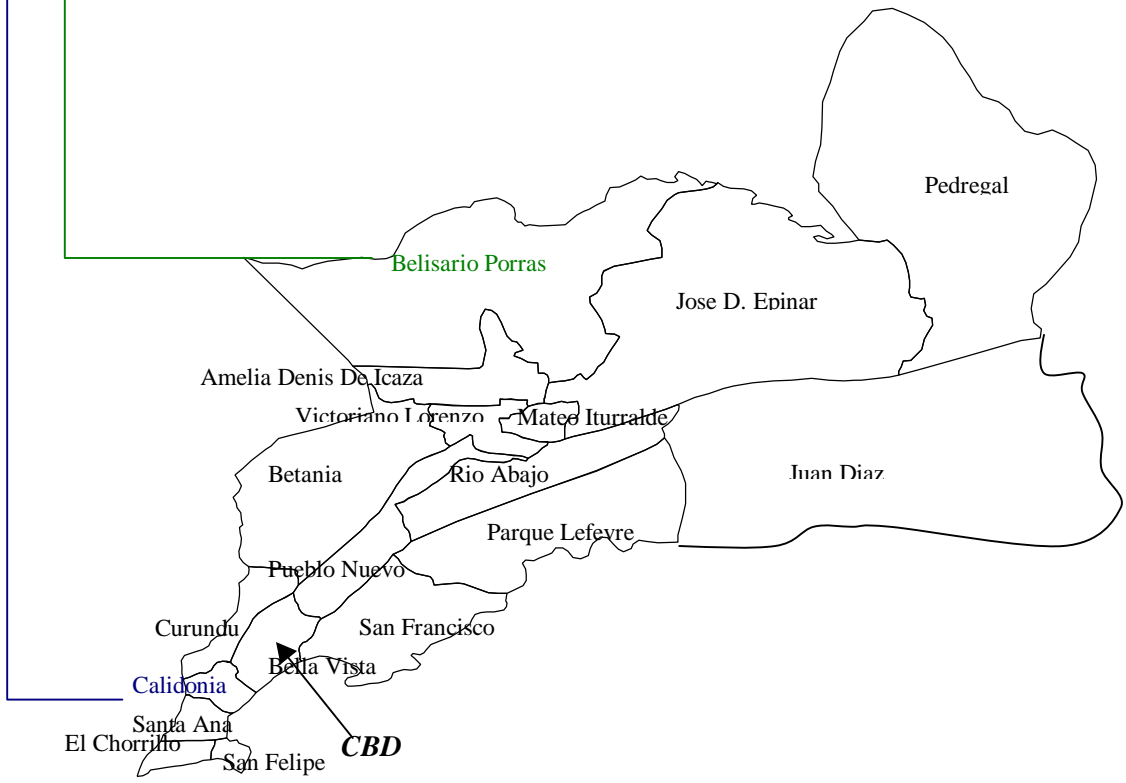


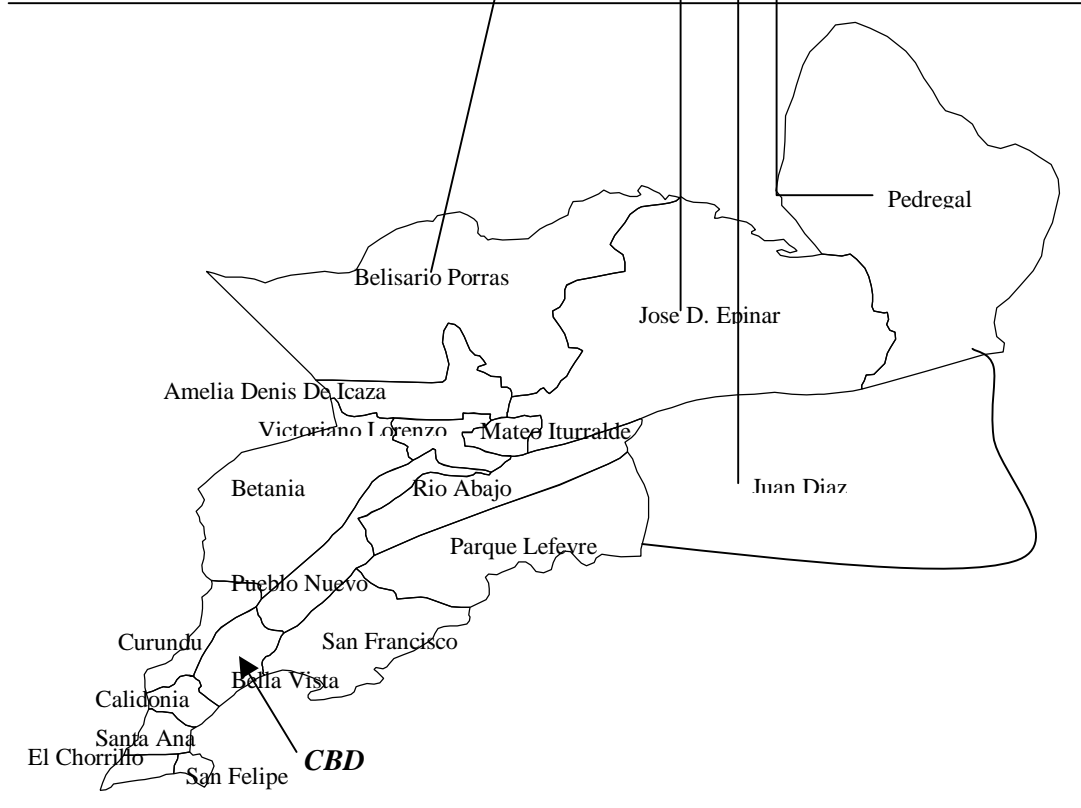
Figure 3.

**Area, Population, and Population Density by Barrio, 1970, 1980, and 1990**

Barrio	Area Km <sup>2</sup>	Population				Density*			Change 1970-90
		1970	1980	1990	Pop.Change 1970-1990	1970	1980	1990	
San Felipe	0.5	12,997	11,049	9,698	-3,299	25,994	22,098	19,396	-6,598
El Chorrillo	0.4	26,120	24,109	16,873	-9,247	65,300	60,273	42,183	-23,118
Santa Ana	1.3	30,526	26,453	26,347	-4,179	23,482	20,348	20,267	-3,215
Exp-Calidonia	1.6	42,800	26,358	22,234	-20,566	26,750	16,474	13,896	-12,854
Curundu	1.1	12,730	16,891	17,866	5,136	11,573	15,355	16,242	4,669
Betania	8.6	37,117	43,819	46,447	9,330	4,316	5,095	5,401	1,085
Bella Vista	5.1	25,692	26,057	23,873	-1,819	5,037	5,109	4,681	-357
Pueblo Nuevo	5.8	19,068	20,791	21,093	2,025	3,288	3,585	3,637	349
San Francisco	5.6	35,496	34,405	33,804	-1,692	6,339	6,144	6,036	-302
Parque Lefevre	6.2	30,863	33,870	38,067	7,204	4,978	5,463	6,140	1,162
Rio Abajo	6.3	25,417	30,409	31,922	6,505	4,034	4,827	5,067	1,033
Juan Diaz	35.6	24,527	51,684	73,485	48,958	689	1,452	2,064	1,375
Pedregal	28.4	14,459	32,651	40,821	23,362	509	1,150	1,437	928
Amelia D.D.I	3.8	17,227	24,068	33,890	16,663	4,533	6,334	8,918	4,385
Belisar Porras	20.0	14,204	79,890	119,271	105,067	710	3,995	5,964	5,253
Jose D. Espinar	23.3	10,508	23,342	58,722	48,214	451	1,002	2,520	2,069
Mateo Iturralde	1.1	11,735	12,226	13,660	1,925	10,668	11,115	12,418	1,750
Victoriano Lorenzo	1.8	14,580	16,898	17,307	2,727	8,100	9,388	9,615	1,515

\*Density Pop. x Km<sup>2</sup>

Sources: Panama, Directorate of Statistics and Census, Censos Nacionales de Poblacion y Vivienda: 1990, Distrito de Panama.  
Panama, Directorate of Statistics and Census, Censos Nacionales de Poblacion y Vivienda: 1990, Distrito de San Miguelito.



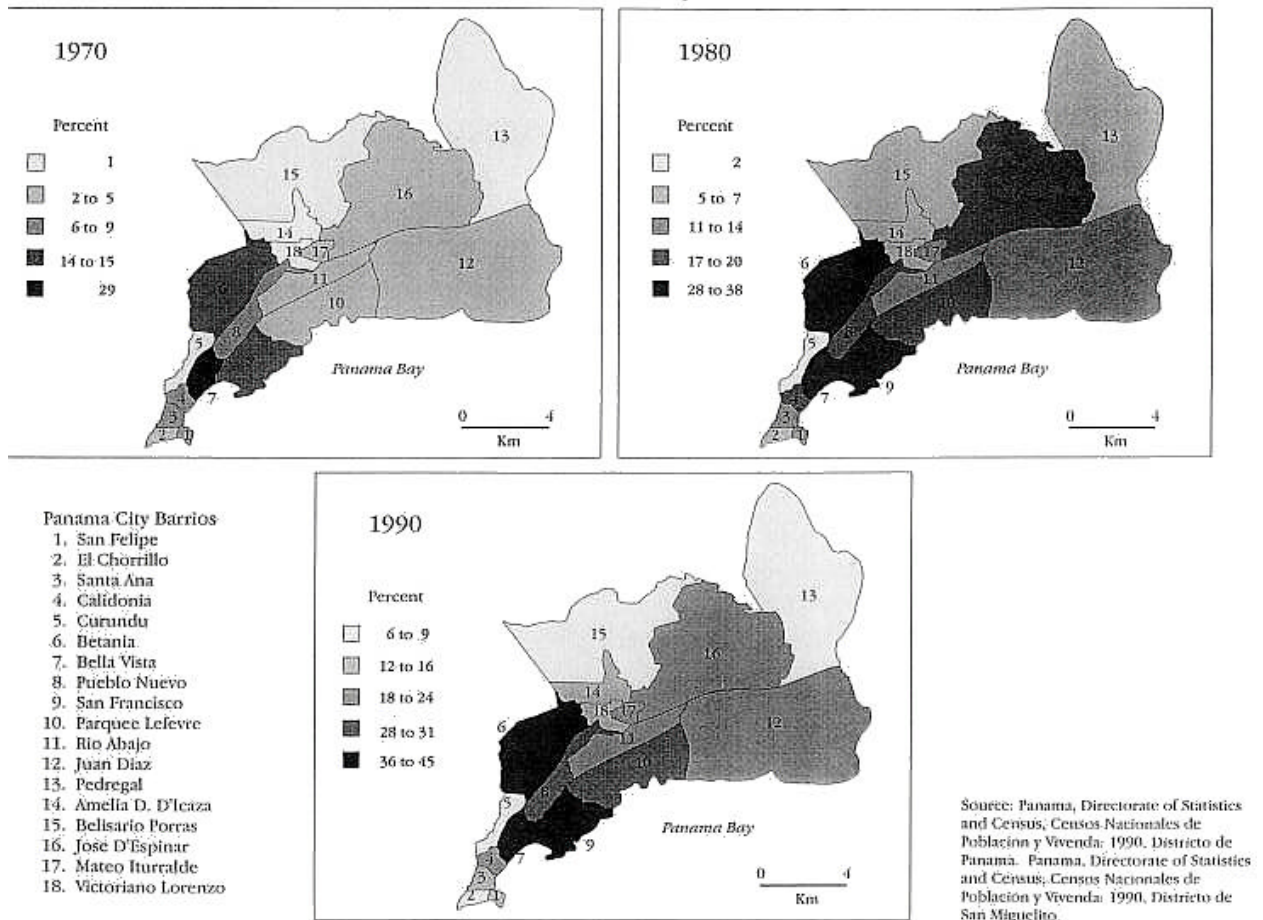
It can be seen from the data in Figure 3 that from 1970 to 1990 most barrios of the center and those adjacent to it experienced a steady decrease in population density. The barrios of the periphery, in contrast, experienced increases. For instance, Jose D. Espinar which population density was of 451 inhabitants per square kilometer in 1970 increased its density to 5,964 persons per square kilometer in 1990. In addition, this barrio experienced by far the largest increase in population from 14,204 in 1970 to 119,271 in 1990.

### Recent Spatial Patterns of Status Groups Allocation in MPC: Continuity of the Post-Colonial City II

Figures 4, 5, and 6 portray the spatial allocation of status groups in Panama City during

Figure 4

Percent College Educated  
Panama City

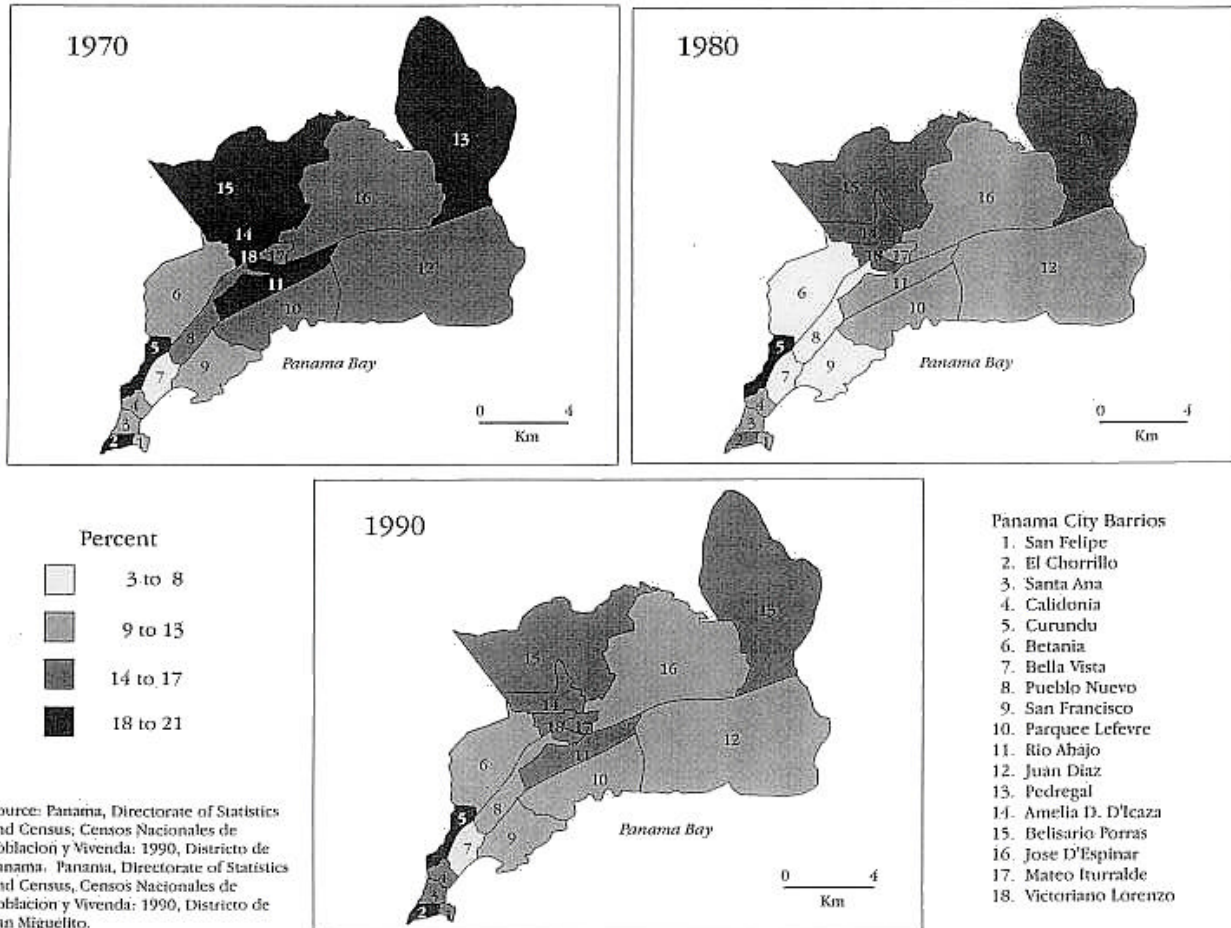


the most recent decades. Although as previously showed a significant shift in the distribution of population took place toward the periphery of the city, the distribution of status groups, as

measured by education, employment status, and median incomes, did not experience discernible changes. It can be observed from data presented in Figure 4 that the allocation of status groups

Figure 5

Percent Unemployment  
Panama City



Source: Panama, Directorate of Statistics and Census, Censos Nacionales de Población y Vivienda: 1990, Distrito de Panamá. Panama, Directorate of Statistics and Census, Censos Nacionales de Población y Vivienda: 1990, Distrito de San Miguelito.

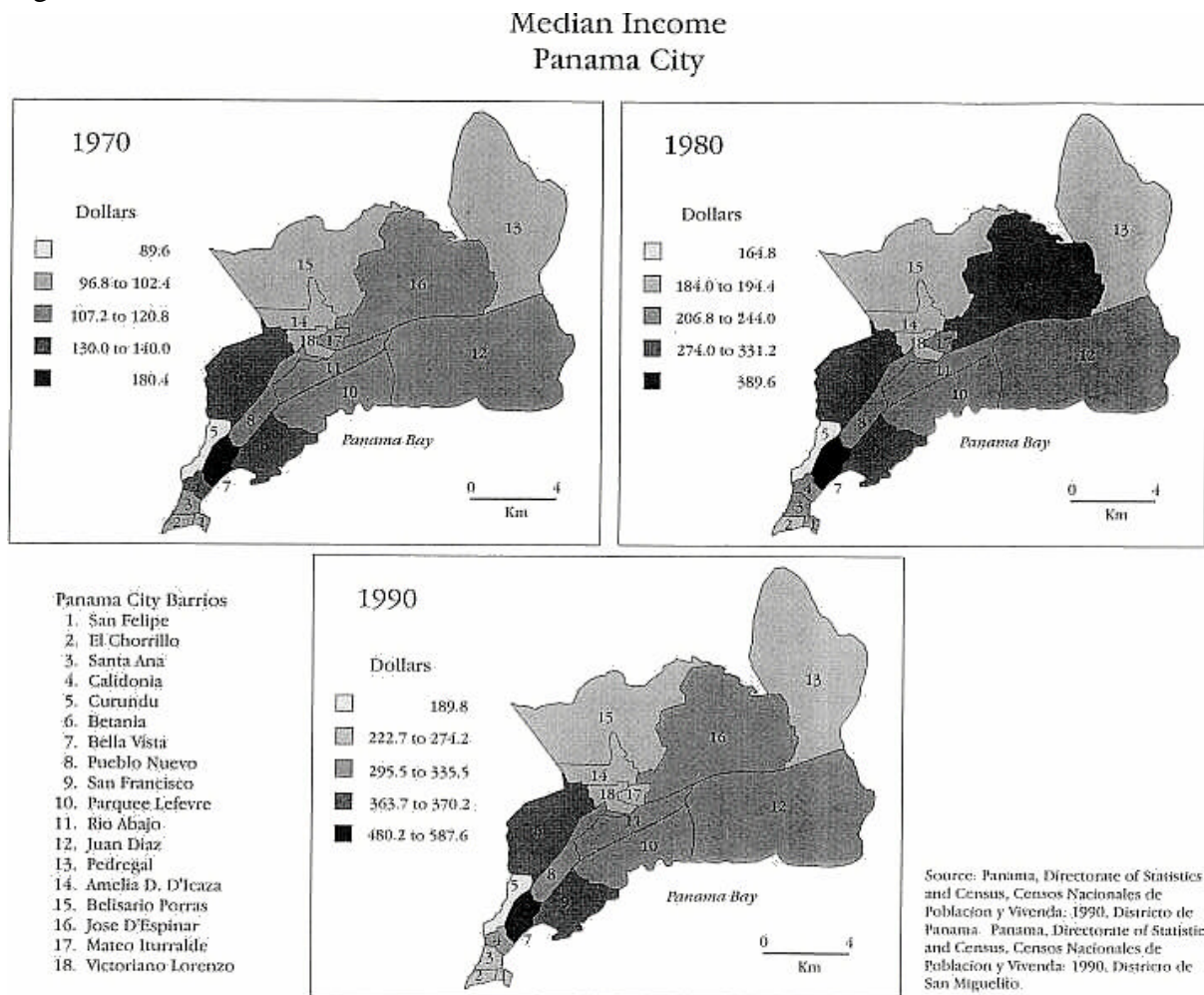
as defined by Education levels remained similar from 1970 to 1990. Bella Vista had the largest concentration of people with college education. Bella Vista was followed by San Francisco and Betania. Although most barrios of MPC increased their population with college education from 1970 to 1990, the barrios of the periphery remained with far lower shares of people with higher education.

Figure 5 shows patterns of residential allocation of status groups as defined by employment status. Data show that levels of unemployment remained geographically distributed similarly from 1970 to 1990. Bella Vista experienced the lowest level of unemployment during the three years examined followed by San Francisco and Betania. The Barrios of the periphery

experienced the largest share of unemployment from 1970 to 1990. It should be noticed, however, that most barrios experienced increase in the levels of unemployment during the period 1980-1990.

Patterns of status groups allocation as defined by median income levels in MPC are shown in Figure 6. As it can be seen from data in Figure 6, the geographic distribution of status groups remained similar from 1970 to 1990. Bella Vista experienced the highest median income level during the entire period under study. It was followed by Betania and San Francisco, respectively. The lowest income levels were located in the old barrios of San Felipe, El Chorrillo, Santa Ana and Curundu and on the newer barrios of Victoriano lorenzo, Mateo Iturralde, Pedregal, Amelia D. De Icaza and Belisario Porrás. The other barrios had different income levels but all of them still far below of those at the center.

Figure 6

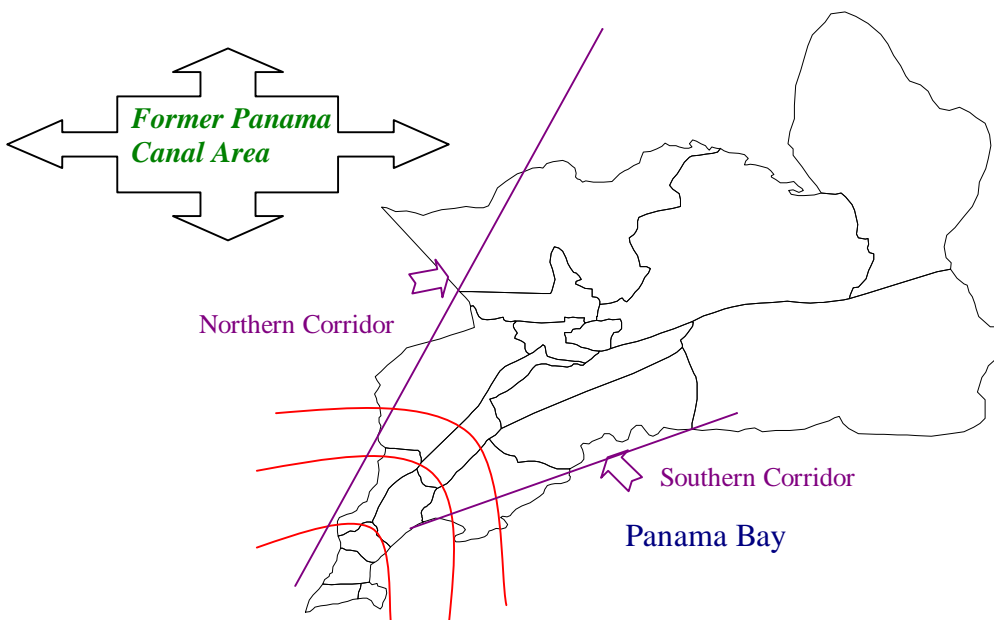


## Considerations for the Future: New Developments Challenge the Post-Colonial City II

The shift of population that took place during the 1970s and 1980s--from the center to the periphery of MPC--reveals distinctive spatial patterns of change in population distribution across MPC's barrios. These spatial patterns as well as the foundations of MPC's spatial structure, however, developed under spatial circumstances of land availability and existent transportation networks that conditioned MPC's spatial patterns of growth and the spatial distribution of status groups. Current developments regarding MPC's access to previously-denied land (the former Panama Canal Area) and the construction of new transportation networks--along the adjacent territory of the Panama Canal--open up new areas for development.

As figure 7 shows MPC developed with two frontiers. On one side the Panama Bay and

Figure 7



on the other side the former Panama Canal Area. Through a progressive process that will consummate by the end of the year 1999, MPC's west frontier will disappear advancing new paths of growth. In addition, the construction of two highways (northern and southern corridors) is underway along both frontiers that further intensify changing conditions in MPC.

Massive foreign investment to turn the 94,000 hectares along the Panama Canal into industrial complexes, maritime services, communication infrastructures, tourism facilities, and residential development have been already reported by Panamanian authorities. Existing

buildings and facilities with estimated value of \$4 billion are planned to be sold to private interests in the near future. In addition, Panamanian authorities and their supporting financial organizations are coordinating efforts which results are expected to intensify and reinforce the role of MPC and the canal area as the center of the country's development.

Thus, the socio-spatial configuration of the Post-Colonial City II is challenged by these developments. It is particularly so considering the attractive location, sound environmental conditions and potential economic and residential development of the former Panama Canal area and the increasing traffic congestion and environmental distress that characterizes the CBD.

### **Conclusion**

The analysis of the most recent patterns of residential allocation of socioeconomic status groups in MPC revealed that at the end of the twentieth century the residential distribution of status groups in MPC remain similar to that of the Colonial Panama City. The Central Business District houses the upper class at the center of the city. The examination of spatial changes of population distribution and population density in MPC during the most recent decades indicates that a shift in the distribution of population took place from the center to the periphery. Although a significant shift in the distribution of population took place toward the periphery of the city, the distribution of status groups did not experience discernible changes. The allocation of status groups, as defined by education, employment status and median income, remained similar from 1970 to 1990. Further research to model the changing spatial distribution of status groups within and across the barrios of MPC is necessary in order to test theories of urban growth including those of the Dual City.

Current developments regarding MPC's access to the former Panama Canal Area and the construction of new transportation networks--along the adjacent territory of the Panama Canal--open up new areas of development which advance changes in MPC's spatial structure. Considering historic and recent patterns of growth, these changes may result in a new and more complex socio-spatial configuration that will need to be further examined and monitored. While recent changes reinforce historic patterns of migration, uneven regional development, and therefore the current dysfunctional national settlement system, they also constitute new opportunities for reengineering Panama's urban and regional development and its settlement

system toward a more balanced and equitable distribution of population, resources, space, and opportunities.

Due to the complexities and immediacy of these developments, the design and adoption of a comprehensive research agenda and an objective and long-term approach on regional and urban development in the Metropolitan Area of Panama is strongly advised. Such an approach should develop considering current and future conditions as well as the historic and geographic circumstances that determined the development of MPC's spatial structure. It creates new challenges for urban and regional research, planning and policy and the need for a democratic urban and regional reengineering process through increasing public awareness and participation. The production of and public access to more accurate demographic, socioeconomic, housing, and spatial data for data visualization, research, planning, and policy making are critical in order to accomplish such endeavors.

## References

- Armstrong, Warwick and T.G. McGee. 1985. **Theatres of Accumulation: Studies in Asian and Latin American urbanization**. London: Methuen.
- Directorate of Statistics and Census. 1991. **Censos Nacionales de Poblacion y Vivienda: 1990; Resultados Finales Basicos, Distrito de Panama**. Panama: Contraloria General de la Republica.
- \_\_\_\_\_. 1991. **Censos Nacionales de Poblacion y Vivienda: 1990; Resultados Finales Basicos, Distrito de San Miguelito**. Panama: Contraloria General de la Republica.
- \_\_\_\_\_. 1980. **Censos Nacionales de 1980**. Volumen VII. Panama: Contraloria General de la Republica.
- Fraizer, Gloria. 1976. **Moving to Stand Still: Third World Poverty and Rural-to-Urban Migration: A Panamanian Case History**. Pittsburgh: University of Pittsburgh.
- Gandasegui, Marco A. 1980. **Acumulacion y Migraciones Internas en Panama**. Panama: CELA
- Gilbert, Alan. 1993. "Third World Cities: The Changing National Settlement System" in **Urban Studies** 30: 721-740
- Gorostiaga, Xavier. 1984. **La Zona del Canal y el Subdesarrollo Panameño**. Panama: Ediciones Tareas.
- Hardoy, Jorge H. 1975. Editor. **Urbanization in Latin America: Approaches and Issues**. New York: Anchor Books.
- Hardoy, Jorge E. and Alejandro Portes. 1985. "Contemporary urbanization research in Latin America" in **Comparative Urban Research** 11: 1-2.
- Jovane, Juan. 1975. "Canal: Dependencia y Subdesarrollo." **Tareas** 30 Panama.
- Leis, Raul A. 1979. **La Ciudad y los Pobres: Las Clases Populares en la Ciudad Transitista**. Panama: CEASPA.
- Lowder, Stella. 1986. **Inside Third World Cities**. London: Croom Helm
- Meditz, Sandra and Dennis Hanratty. 1989. **Panama: A Country Study**. Washington D.C.: Federal Research Division.
- Shrestha, Nanda. 1992. "The Third World City" in **Interpreting the City: An Urban Geography**; Edited by T. A. Hartshorn. New York: John Wiley & Sons, Inc.
- Uribe, Alvaro. 1989. **La Ciudad Fragmentada**. Panama: CELA.
- Varela, Olmedo J. 1998. **The Panama Canal, Migration Streams, and the Changing Patterns of Human Settlement in the Republic of Panama**. Milwaukee: University of Wisconsin Joint Center for International Studies.