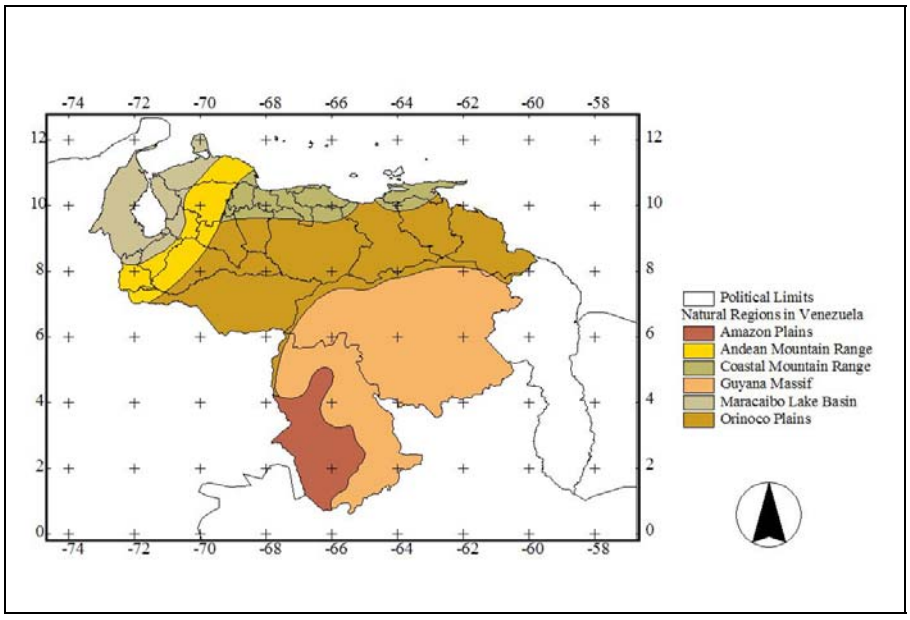
Chapter 4

4 Mérida, the City

4.1 Introduction

In this chapter, a series of descriptions are performed, at different geographical levels, in order to obtain a clear vision of Mérida City and its context. The general contour features in the city, as well as the population contents within the political units of the city are described. A brief history of Mérida, with the growth patterns and important facts in infrastructure development serves as the basis to understand the city's current physical state, which is described through data from the last National Census performed in the year 2001, by means of the different facilities and services available in Mérida.

4.2 Venezuela's Geographical environment



Map 4.1: Natural Regions in Venezuela

Venezuela is located in the northern part of South America, open to the Caribbean Sea through its northern flank, limiting with Brazil to the South, easterly with English Guyana and

westerly with Colombia. Total estimated surface is 912,050 km^2. The country is divided into six natural regions (Map 4.1) with geographical variety and differences between the geologic formations that compose it. The six natural regions are:

1. Maracaibo Lake Basin: located northwest between Colombia, the Caribbean Sea and over the western border of the Andean Mountain system, Maracaibo Lake's depression extends separated from the rest of the subcontinent by the Perijá and the Mérida Mountain chains on its western and eastern sides respectively. Northern bound is Venezuela's Gulf that constitutes Maracaibo Lake's opening to the Caribbean Sea; towards South it is limited by the Táchira disjunction located on the vertex of the mountain chains. Coastal zones of Falcón and Zulia States in the western side of the country are at low altitude and descend smoothly towards the sea.
2. Andean Mountain Range: located southerly of the Maracaibo Lake Basin constitutes the most important part of Venezuela's mountain systems. This mountain range enters Venezuela from Colombia by the Tamá moor running a distance over 450 km through several states (Táchira, Mérida, Trujillo and Lara) until it reaches the coast. Mérida's Mountain Range separates into two branches forming different mountain chains: the Barbacoas, the Tovar and the La Culata sierra; and the Tamá, Uribante, Calderas, Rosario, Portuguesa, Nevada and the Santo Domingo sierras. The latter extends towards the inland with great altitudes in the peaks: the Bolivar (5,007 m), the Humboldt (4,924 m) and the La Concha peaks (4,922 m) all inside Mérida's Mountain Range.
3. Coastal Mountain Range: located in the northern flank limiting with the Caribbean Sea, it rises over a narrow coast connected in its westerly border with the Andean Mountain Range, crossing the Caribbean coast up to the Paria peninsula in front of which is the Trinidad Island. The Mountain Range is composed of two parallel chains, the coastal chain, with its greatest altitude in the Naiguatá Peak (2,765 m) and the interior chain; between these mountain chains are the Aragua, the Caracas, and the Tuy valleys. At East encounters the Unare depression which, connecting the northern interior plains with the sea, separates the Coastal Mountain Chains from the western massif. The latter, with scarce altitude but abrupt slope over the ocean, extends towards the Paria sierra forming the peninsula after its name.
4. Orinoco Plains: located in the central Venezuelan plains at south and southwest of the mountain regions and limiting with Orinoco River by the southwest, comprises an alluvial region formerly a great sea gulf. This gulf after suffering the consequences of Andean folding during the Tertiary decanted towards east receiving the sedimentary materials supplied by the rivers flowing through. The plains are divided into three main parts: the High Plains, free of flooding due to the overflow of rivers in rainy season. The Low Plains, periodically flooded by the former climatic effects mentioned and the Tablelands separating the Monagas plains with the rest of the prairies with an average altitude over 200 m.
5. Guyana Massif: also identified as the Guyana Shield, is located southeasterly in Venezuela, limiting south with Brazil is an antique formation with Precambrian base and a thick layer of sedimentary material. All the Orinoco River tributaries flow through the Massif; this has formed large and deep valleys with massive hills and mountains called Tepuis, among which can be found: the Roraima (2,772 m), the Tramán Tepui (300 m), the Duida (2,400 m) and the La Neblina (3,100 m). In this region is also located the Angel waterfall, the highest in the world with 972 m in altitude.
6. Amazon Plains: southerly part of the country, limiting west with Colombia and south with Brazil. Connects the basins of the Orinoco and the Amazon Rivers.

4.3 Population in Venezuela

Total estimated population is 20,054,210 inhabitants [INE, 2001]. Although Venezuela has a great territorial extension, over 75% of the population is concentrated in less than 25% of the territory, in cities located on a stripe over the Andean and Coastal Mountain Ranges, and over the Maracaibo lake basin. Around 80 percent of total population lives in the mountain ranges with densities up to 1,100 people per square kilometer (Caracas metropolitan area), 18 percent in the plains and the rest in Guyana where density does not reach 1 inhabitant/km^2. The fifth part of total population lives in the Caracas Metropolitan Area.

4.4 Mérida State Geography

4.4.1 Contour

The mountain chains contrast with interior valleys and plains. In the mountain contour two great rows travel: the La Culata and the Nevada ranges. The latter constitutes the dominant nucleus with the higher altitudes of the country with the peaks: Bolivar (5,007 m), Humboldt (4,942 m), Bompland (4,883 m), La Concha (4,922 m), El León (4,740 m) and El Toro (4,755 m). In the La Culata range higher altitudes are the Pan de Azúcar peak (4,620 m) and the El Águila peak (4,048 m). Soils in the mountain sector are quite uniform despite the topography, with shallow depths and rocky composition and a scarce presence of organic matter. Profitable land is available where slopes are low and consequently soils are deeper and richer in organic matter, favorable to agricultural activities, and located inside valleys. Piedmont soils are clayey textured, with a low permeability and small depths. Soils in the plains have the greatest potential for agriculture.

4.4.2 Climate

A wide range of climates are present in Mérida State, from tropical climate in the plains to highland climate in the highest mountains, and from semi-arid nearby Lagunillas to humid-tropical in the mountainsides. Humid climate covers almost 90% of the State's surface. Temperatures are also very different from one location to another, due to the topographic characteristics of mountain ambience. In Palmarito, a town in the shore of Maracaibo Lake, average temperature is 27º C, meanwhile in the highest peaks, average temperatures are lower than 0º C. Pluviosity ranges -depending on the location- may vary from 700 mm to 1,800 mm yearly.

4.4.3 Hydrography

Two principal flows exist, one to the Caribbean Sea through Maracaibo Lake and the other to the Atlantic Ocean through affluents of the Orinoco River. The Chama basin outstands in the first flow mentioned, within it, as well as in other basins flowing towards Maracaibo Lake glacial-formed lagoons are numerous, being the most important: the Mucubají, the Negra, the Verde, the Urao and the Santo Cristo lagoons. Mérida State generates near 10% of waters flowing at the north of the Orinoco River.

4.4.4 Political division

In Venezuela political division comprises federal units called States, which are divided into Municipalities and these are divided into Parishes or Districts. Mérida State is comprised of

23 municipalities and 82 Parishes, where the capital city of the State is the city of Mérida, in the Libertador Municipality (see Map 4.2), which is the one containing the greater number of parishes, (15 parishes in total), where most of them comprise the metropolitan area for the state capital.

Map 4.2: Municipalities in Mérida State and their capitals, after [INE, 2001].

4.4.5 Population

From the last census performed in Venezuela (October, 2001) total population for the Mérida state is 715,268 inhabitants, with 630,778 people in urban areas (88.19% of total state population) and 84,490 people in rural areas (11.81% of total state population). In Table 4.1, population distribution in Mérida State Municipalities is shown; Libertador Municipality is the most populated of all, with 204,879 inhabitants representing the 28.64% of total state population and 32.07% of total urban population in the State. Urban population is greater than rural for most of the municipalities with percentages over 70% of total municipal population.

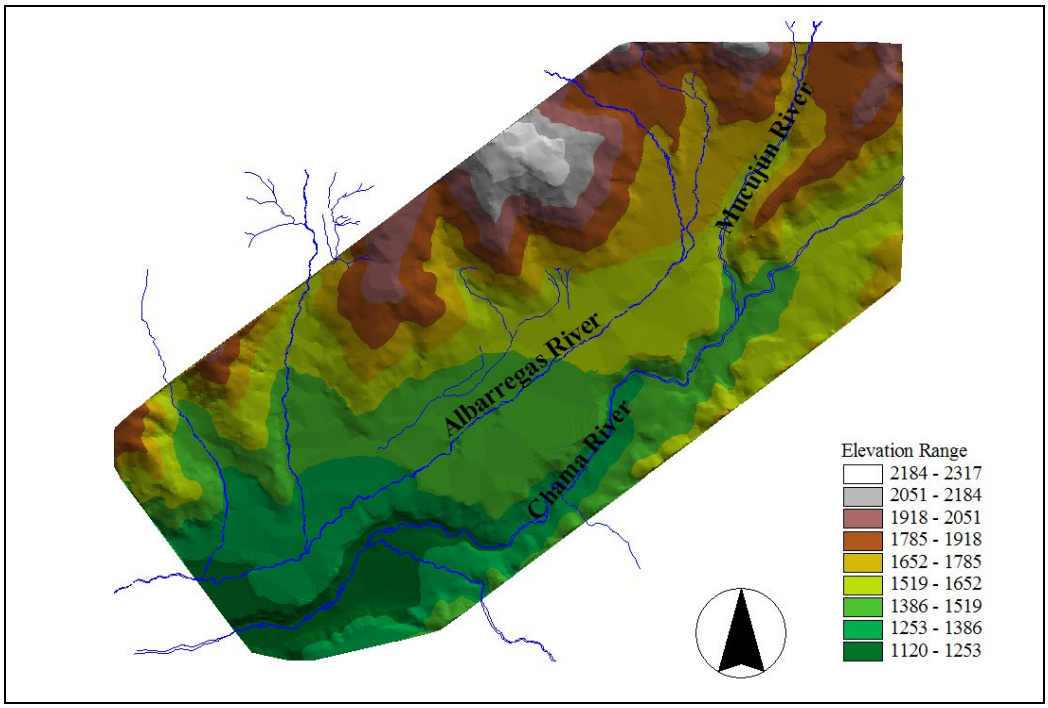
	Municipality	Rural		Urban		Total People
		People	%	People	%	
1.	**Alberto Adriani**	6,337	5.97	99,747	94.03	106,084
2.	**Andres Bello**	2,760	23.69	8,892	76.31	11,652
3.	**Antonio Pinto Salinas**	7,574	32.54	15,702	67.46	23,276
4.	**Aricagua**	3,911	89.23	472	10.77	4,383
5.	**Arzobispo Chacon**	9,320	66.45	4,705	33.55	14,025
6.	**Campo Elias**	4,306	5.23	78,091	94.77	82,397
7.	**Caraciolo Parra Olmedo**	3,381	15.01	19,143	84.99	22,524
8.	**Cardenal Quintero**	2,094	26.73	5,739	73.27	7,833
9.	**Guaraque**	4,655	55.40	3,747	44.60	8,402
10.	**Julio Cesar Salas**	3,523	28.86	8,684	71.14	12,207
11.	**Justo Briceño**	3,484	67.00	1,716	33.00	5,200
12.	**Libertador**	**2,576**	**1.26**	**202,303**	**98.74**	**204,879**
13.	**Miranda**	4,190	21.20	15,570	78.80	19,760
14.	**Obispo Ramos de Lora**	1,786	8.56	19,087	91.44	20,873
15.	**Padre Noguera**	452	18.12	2,042	81.88	2,494
16.	**Pueblo Llano**	627	6.58	8,905	93.42	9,532
17.	**Rangel**	1,755	11.54	13,451	88.46	15,206
18.	**Rivas Davila**	1,567	9.79	14,434	90.21	16,001
19.	**Santos Marquina**	407	2.95	13,388	97.05	13,795
20.	**Sucre**	12,234	27.54	32,184	72.46	44,418
21.	**Tovar**	2,521	7.68	30,284	92.32	32,805
22.	**Tulio Febres Cordero**	3,696	13.00	24,741	87.00	28,437
23.	**Zea**	1,334	14.68	7,751	85.32	9,085
	TOTAL	**84,490**	**11.81**	**630,778**	**88.19**	**715,268**

Table 4.1: Population in Mérida State Municipalities, after [INE, 2001].

4.5 Geographical Features in Mérida City

Mérida City is settled over an elongated plateau inside a valley, within the Andean mountain range in Venezuela. This plateau is oriented SW-NE surrounded by two mountain chains: the Sierra Nevada (NW) and the Sierra de la Culata (SE). Two rivers flow through the tableland: the Chama and the Albarregas rivers. The latter (Albarregas river) in the NW divides the city in two portions with a shallow canyon in between (10 m ≤ height ≤ 20 m); and the Chama river at the SE side of the plateau with a deeper canyon (50 m ≤ height ≤ 180 m). The Chama River's canyon determines the urban area's geographical limit over this flank (base of the Sierra Nevada mountain chain). Altitudes in the tableland range from around 1,100 m at the southeasterly bounds to 1,900 m at the northwesterly limits (Map 4.3). The Sierra de la Culata mountain chain constitutes the NW geographical limit of the plateau. Convergence of these two mountain chains at the northeast side forms a smaller valley dedicated to agriculture called El Valle Grande. In the southwest, the plateau limits with the conjunction of the two rivers along the city in a place called La Punta where a small city lies (belonging to Mérida's metropolitan area).

The tableland covers an approximate area of 60 km^2, with geographical coordinates: 8º32'34'' and 8º38'49'' of North Latitude in its southern and northern parts, and 71º7'20'', 71º5'42'' of West Longitude in its extreme lateral sides. General configuration is rectangular (in plan) and elongated in the SW-NE direction.

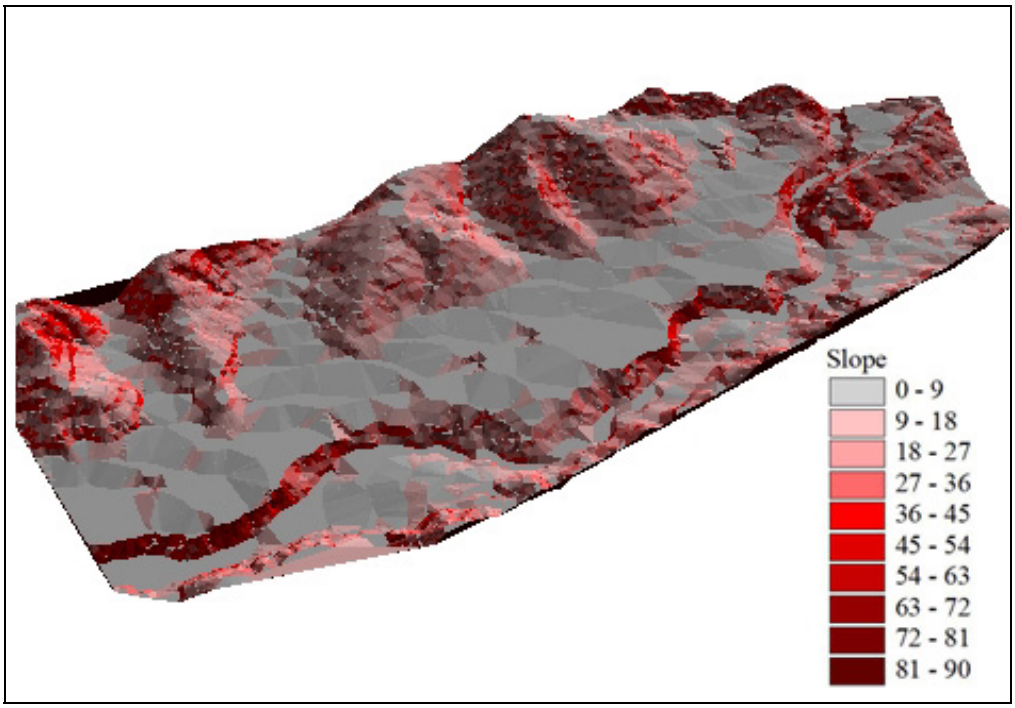


Map 4.3: Elevation Range in Mérida's Tableau.

4.6 Contour characteristics in Mérida's Tableau

Basically, two topographic accidents define the general contour: a plane surface with a slope mostly below 10% and in few locations up to a 15% (that constitutes Mérida's plateau) and another with high contours and slopes greater than 16%. Plane surface occupies the central region with the same general orientation of the Chama and Albarregas rivers. In its northwestern side presents undulated portions with between 3 and 16% of slope where alluvional cones are located.

The Chama and the Mucujún rivers limit the plateau, at NE and SE sides, respectively, by banks with varying heights between 50 m and 180 m, and variable slopes generally greater than 30%. The Albarregas River crosses the tableau longitudinally, with banks at both sides and heights oscillating between 10 m and 20 m, presenting similar slopes as the Chama and the Mucujún banks (Map 4.4, slopes are indicated in %).



Map 4.4: Slope classification for Mérida's Tableau.

4.7 History and physical evolution

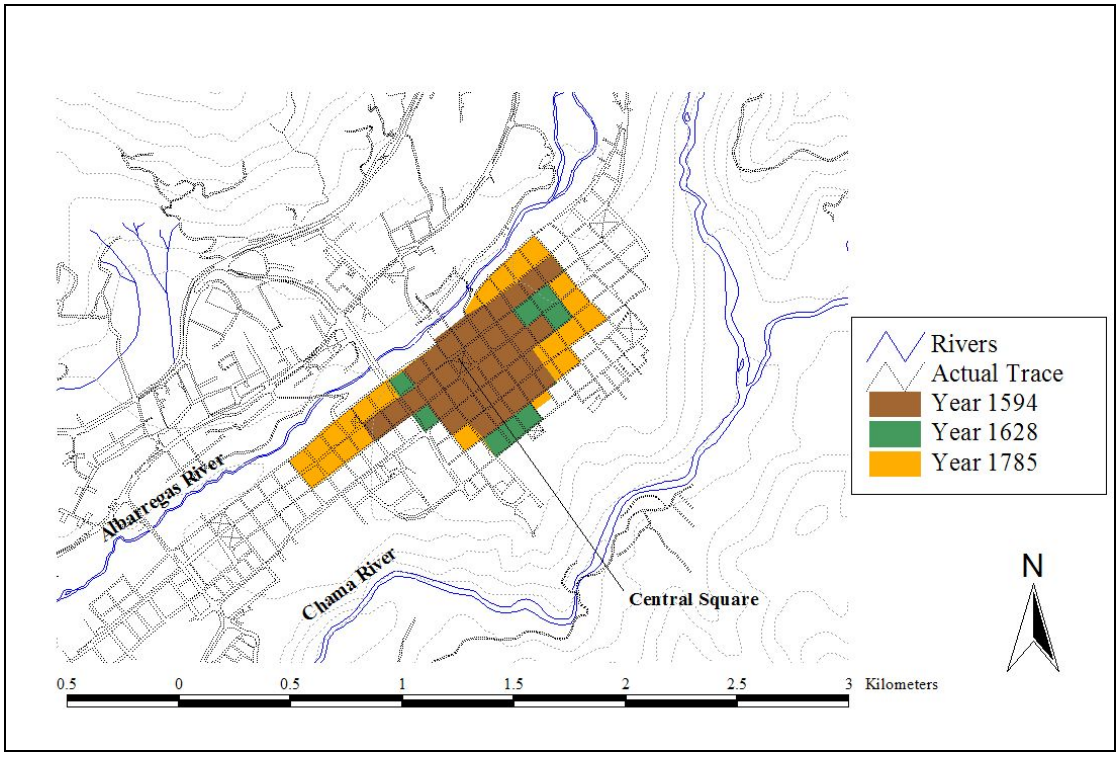
Mérida city had two previous locations before setting between the Albarregas and Chama rivers plateau (actual settlement). Date and place of first foundation is October 9th 1558 in Lagunillas de Urao (southerly to actual location), where the Urao lagoon is a prominent natural site; the name chosen for the city was: "Emerita Augusta" honoring the Spanish city in Extremadura, homeland of its founder: Captain Juan Rodríguez Xuárez. As foundation is performed, so are explorations over upper lands in search for more land to distribute and exploit among colonists. On march 1559 and after a series of political disputes, Juan de Maldonado moved the city 24 km northward, to the location of what is now "La Punta" (actually, part of Mérida's metropolitan area) renaming it as "Santiago de Los Caballeros". Few years later the city was definitively moved and re-founded northerly inside the plateau between the Albarregas and the Chama rivers, restoring partially its original foundation name: "Santiago de Los Caballeros de Mérida".

The basic physical feature of the city is the orthogonal array with square blocks surrounded by streets, responding to foundation ordinances in the Indian Laws applied through all Spanish overseas provinces. This configuration served administrative and defense purposes, locating a central open square, the "Plaza Mayor", around which powers in society were represented through their buildings: civil and military government, Catholic Church, convents, and houses for the most important citizens. These buildings formed a first ring around the central square comprising the center of a concentric scheme where distance from the center determined the relevance of the social status held. Outwardly this locus composed by the Central Square and first ring, concentric differentiated sectors appear, as in all classical Hispano-American cities. In the sector where reticular orthogonal trace initiates disgregation, free professionals and employees occupy the space, with buildings of lower quality and value. The following sector or concentric ring was composed of suburban farms and houses, property of the wealthiest people in the city, establishing a filter to the next space: an agricultural exploitation zone where pawns and slaves had their residence and work place.

The Colonial physical scheme remained almost unaltered through the following centuries, including the first half of the 20th century; this fact was mainly due to the predominant agricultural economy, the very limited development of commercial activities and the land value of the urban center, which was the site of government, wealthy families and ecclesiastic hierarchy. In the following, a summarized description of each century, from the 17th century is presented to illustrate the city's growth and evolution.

17th Century:

The city of Mérida is separated from the government of Tunja (year 1607) and is named capital of a region including the cities of San Cristóbal and Barinas, among others. Population is around 1,000 inhabitants, and several of the religious important facilities are built: The Santo Domingo (year 1628) and the Santa Clara (year 1651) Convents. The character of regional administration headquarters gave to the city a prominent status over other cities in the region, concentrating administrative, political and ecclesiastic activities.



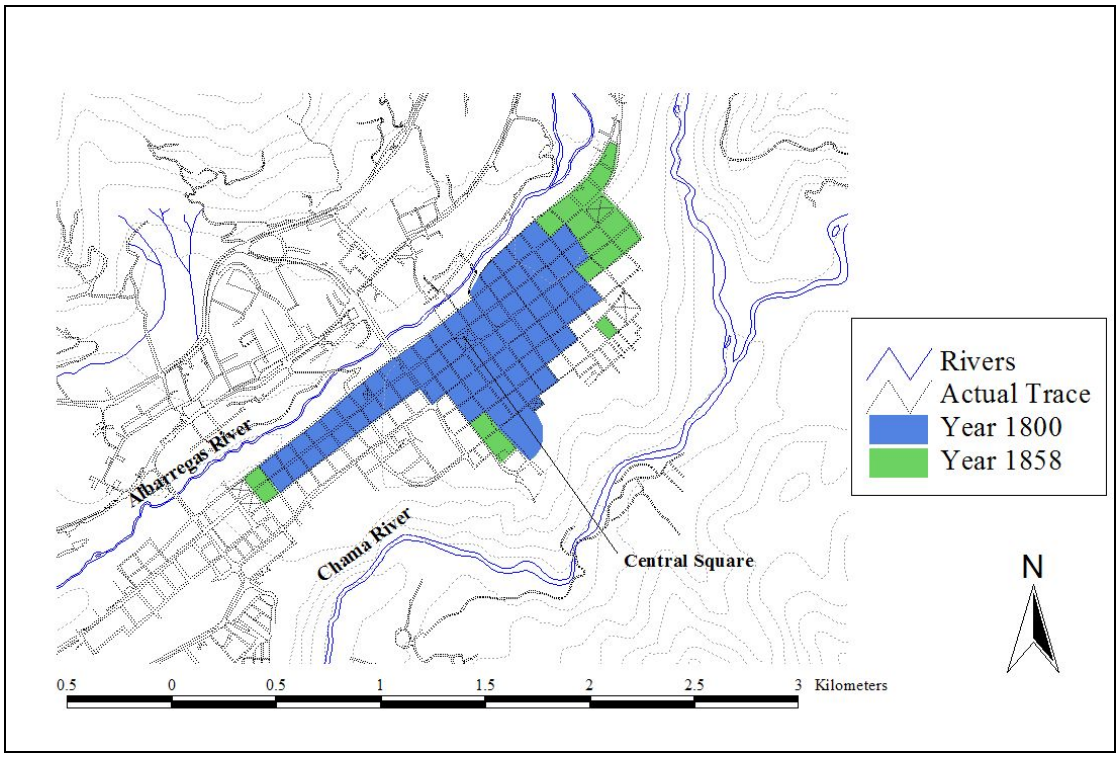
Map 4.5: Growth of Mérida from 16th to 18th Century.

18th Century:

Growth of the city is very slow during most of this century, actual location of the Bolívar Square (Center of the city) is presumed to be from the half of this period (around year 1750). In 1785 Friar Juan Ramos de Lora founds the seminar, institution that later gives birth to the University of the Andes; this fact is very important in Mérida's history, as it becomes the first city with an ecclesiastic educational institution after Caracas. A year later, a strong earthquake damaged part of the city's buildings, most of them houses, and the San Francisco Convent, headquarters of the recently founded seminar; this same year, building of the cathedral begins. This Cathedral was conceived at the moment as a reproduction of Toledo's (Spain) cathedral. As seen in Map 4.5, occupation pattern is an orthogonal array of streets and squares (of approximately 100 by 100 m^2); the growth from foundation to the 18th century is presented graphically in different overlaid colored surfaces corresponding to the sequence described in

the legend. Difference of surface occupation from 1594 (35 squares) to 1785 (65 squares) is 30 squares, almost doubling the surface.

Population in the city for the first two and a half centuries after foundation was exclusively composed by white Spanish neighbors and their descendants, understanding that each neighbor was a head-of-the-family counting for five inhabitants of the same condition [Díaz, 1977]. The rest of the population was composed by Indians, only counting as labor workers but not as inhabitants, most of them living in the outer ring of the disgregated physical structure of the city. By the year 1571, Mérida counted with 30 neighbors, i.e. approximately 150 Spaniards, later, in 1600 this quantity raises to 150 neighbors, accounting for approximately 750 white inhabitants. In the 1750's, population was 500 neighbors (around 2,500 inhabitants), and at the end of the century 4,741 inhabitants.



Map 4.6: Growth of Mérida in 19th Century.

19th Century:

At the dawn of the century the city had around 5,000 inhabitants, wide and comfortable patio-houses, rock paved streets with ceramic tiled sidewalks, aqueduct and several religious buildings confronted to open squares. Total occupation surface is around 75 squares at the end of the century. Due to the strike of two great earthquakes (the 1812 and 1894 earthquakes) the 19th century is considered as the most critical stage in Mérida's growing sequence, as the city had to be rebuilt twice in less than 100 years. The 1812 earthquake destroyed great part of the city inducing the church administration to consider moving all clerical institutions and administration to the city of Maracaibo; fortunately, civil government did not allowed the movement that would have reduced the city to a rural town. The 1894 earthquake generated, along with generalized damage, the destruction of very important documents in clerical buildings, disappearing with these important parts of the city's chronicles and history. At the half of the century, 9,500 inhabitants populated Mérida's province, with a political structure that comprised three urban districts and eight rural districts. In 1897, the implementation of electrical power in public spaces and particular houses gave birth to a fundamental change in

the colonial structure and function of the city. In Map 4.6, the physical structure of the city is shown at two phases, corresponding to the years 1800 and 1858, where growth is seen mostly located at the northern sector of the tableau limits, as southern locations were used for agricultural activities.

20th Century:

This period may be separated into two halves, the first corresponding to a very limited growth of the city and the second, to a violent expansion around the 1950's and the following decades.

From 1900 to 1950:

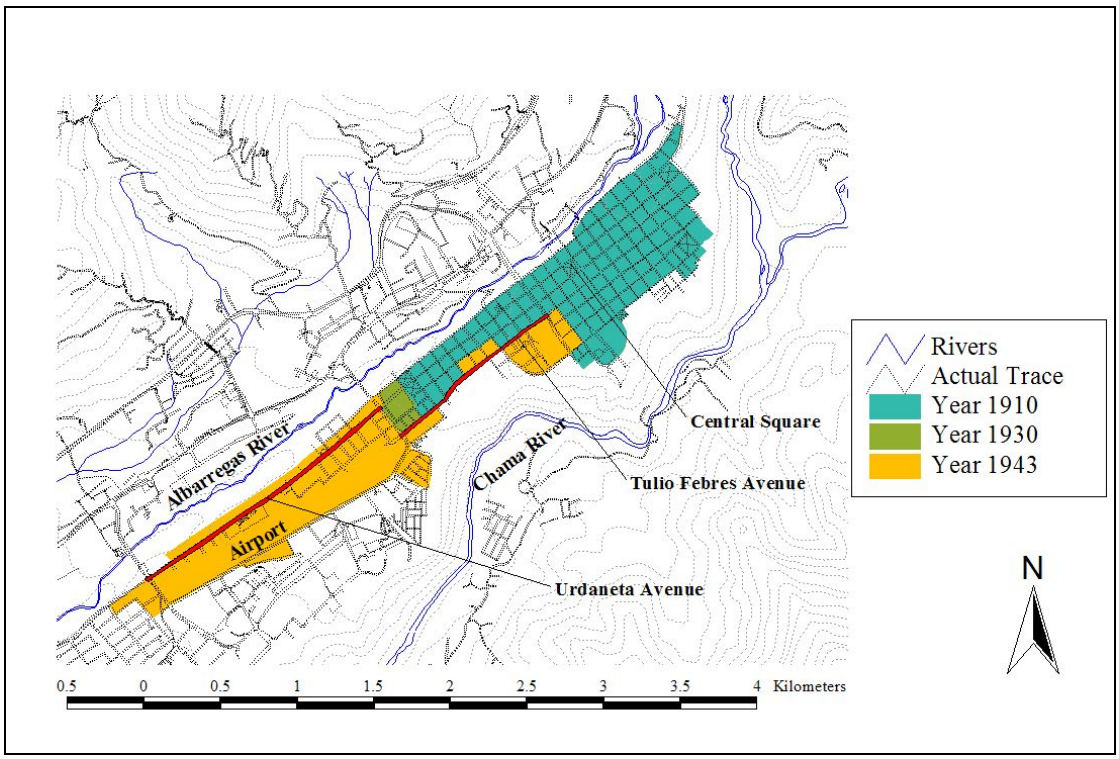
In the first two decades (1900-1920) only several civil facilities were built, among them: the new cathedral's tower, reconstruction of the 3rd avenue (Independencia) and the new phase of the Albarregas aqueduct. By 1925, oil exploitation in Venezuela begins, configuring a new economic model for the country, where most of the oil benefits were concentrated in the center-north cities of the country (Caracas, Maracaibo, and Maracay). Consequently, population immigration was oriented towards these three cities as the economic activity generated by oil exploitation acted as a strong attraction to the population seeking for a better life. A comparison of population percentages between Center-North cities and Andean cities evidences a concentration increment over the first and the decreasing percentages over the second (Table 4.2).

Region	Population percentage in 1920	Population percentage in 1936	Population percentage in 1941	Population percentage in 1950	Population percentage in 1961
Andean	19	18.9	18.3	15.7	13.2
Center-North	22.8	23.8	24.3	28.1	32.4

Table 4.2: Percentages over total population in Venezuela for Andean and Center- North regions [Caminos, 1967].

Mérida, by the time, was a rural town dedicated mostly to agricultural activities. Population increment in the city is a consequence of natural growth (i.e. positive difference between birth and death rates in population), for this period, the birth-rate in Andean cities was greater than 40 per thousand inhabitants while mortality reached levels of 15 per thousand [Caminos, 1967]. The construction of the Trans Andean road (opened in 1925) connected Mérida with its own state and with the rest of Venezuela allowing an easier migration of the population from rural areas to the city and from the city to other attraction poles in the country (Caracas, Maracaibo). In 1926, census data for population in Mérida city rises to 5,945 inhabitants and in 1936 rose up to 12,006 inhabitants. The city started to play a regional urban center role in the state, attracting population from surrounding rural areas. For this third decade medical-assistance services such as: the venereal and odontological dispensaries, the prenatal care center, the child's reformatory, the beggars asylum and the Andean Hospital, improved health conditions not only to the city's inhabitants, but also to the rest of the state's population. Civil works such as streets pavement change from pebbles to reinforced concrete, total electrification of the city with a new generator plant and the expansion of electrical lines to the neighboring town of Tabay comprise the most relevant physical features of growth in this period. In the 40's, the actual configuration of the city begins to take form where almost all adequate surfaces over the tableau were occupied (Map 4.7). The project and further

construction of the Tulio Febres and Urdaneta Avenues and the airport, established a link to the unoccupied southwest flank of the tableau. A sewer system for the city and the construction of interurban roads to connect Mérida with surrounding towns were also relevant civil works that evidence growth in this decade. Data available for population corresponds to year 1941, when the city had 14,544 inhabitants [Caminos, 1967].



Map 4.7: Growth of Mérida city in the first half of 20th Century.

The 1950's:

A new paradigm is established for the entire country, with the modernization and construction policies of the central government in order to equip with up-to-date facilities and services all the national territory. Investment capital came from oil production, as Venezuela became at the side of Mexico one of the most oil-rich countries in the continent. Dictator Pérez-Jiménez's government (1948–1958) built road networks, train networks, electrical power dams, airports, ports and new adequate infrastructure for the cities: avenues, public buildings and education facilities, with a new spatial occupation pattern responding to the several alternatives and focuses for urban design available in Europe and the United States of America. In Mérida, the occupation of the west river band of the Albarregas River begins occupying lands over an alluvial table and trespassing the limits imposed in the tableau by the Albarregas river canyon. An urban expansion to the suburbs is initiated by means of social strata redistribution within urban space; the wealthiest inhabitants began to occupy the southwest sector with new developments characterized by plain terrains, climatic comfort and an almost total equipment of urban services and facilities. The old town (Colonial Center) suffered a change of land use from mostly residential to commercial, private/public services and as residence for the lower social stratum. Consequence of the latter is the vertical growth of the city, where new several-stories buildings (not more than 6 stories) substituted many of the old patio-houses increasing population density and raising the levels of diversified usage of urban land. A new plan for the buildings around the Bolívar Square is performed by the

Spanish Architect Manuel Mujica Millán with the construction of the Government headquarters building, the Cathedral and the central building for the University of The Andes [Muñoz, 2000]. Complexes such as the Engineering Faculty, the Medicine Faculty and the Male Residence of the university (at the Tulio Febres Avenue) contributed to complement the city's physical structure. The polycentric character of the city starts at this stage, with the southwest expansion and the conurbation of southerly towns of La Parroquia and Ejido to Mérida's metropolitan area. This modification of the colonial pattern is also induced by the introduction of motorized vehicles as the principal transportation resource, decreasing time-consumption in daily displacements inside the city [Amaya, 1983]. By the year 1950, population census rose to 25,064 inhabitants (Table 4.3).

The 1960's:

After the fall of Pérez-Jiménez in 1958, a new country is born under the precepts of democracy and populism. The new political order proclaimed social justice, equality and the opportunity to redistribute among citizens the oil benefits by means of national interest projects. These projects comprised a massive education system and infrastructure construction at all levels, a social security system with a hospital network all over the country and the rest of the infrastructure programs following the modernization paradigm in the preceding dictatorial government [Pineda, 1992]. The great population growth, due mostly to population migration from rural to urban areas and to better sanitary and medical assistance conditions, generated a second expansion in the city. In Mérida, the physical growth was sectorised by differentiated social strata occupation of land. New urban dwelling developments were created at north and south of the city for the use of middle-high class, as well as social interest urban developments at south for middle class. It is important to remark that these developments were officially planned and built with all the urban services disposed by new urban codes recently available at that time. Low class social stratum composed mostly by laborers had to occupy the inappropriate urban land left from urban zonation plans of the city; settlements were generated informally through land invasions, with the consequent high densities and lack of urban services and facilities. Most of these took place in marginal areas of the tableau over both river canyons with high slope terrains where informal invaders would not be evicted. In this decade, the growth of the University of The Andes contributes to the city's physical development by means of the creation of new schools to cope with superior education demands generated by the modernization paradigm. The University expands from the center of the city to the new spaces available, such as the Students Residence (southwest), the Forestry Sciences complex (northeast), the Pharmacy Faculty (southwest), and the Economics and Humanities Faculties (northeast). Population for 1961 was 46,409 inhabitants (Table 4.3).

Year	Population	
	Mérida	**Venezuela**
1873	3,371	1,723,411
1881	3,914	2,005,139
1891	4,741	2,221,572
1920	5,623	2,497,525
1926	5,945	2,814,131
1936	12,006	3,364,347
1941	14,544	3,850,771
1950	25,064	5,034,838
1961	46,409	7,524,000

Table 4.3: Population data from 19th century to mid-20th century [Pineda, 1992].

1970 to 1990:

The northern alluvial table is connected to the central portion of Mérida by the construction of three bridges over the Albarregas River linked to the new Americas Avenue allowing a transverse urban growth. The actual polycentric character of the city is completely defined by the distribution of differentiated activities in urban space: public services and administration with commerce and high-density residences (apartment buildings) at the center, industrial activities at southeast and along the Pan-American road, high-standing low-density residence areas at southwest; University facilities at Southeast, center and northeast with a great occupation area. The margins over the Albarregas River in the central portion of the city became a place for concentration of informal urban settlements (as explained previously) increasing even more the population density in this sector. Other settlements of this kind are generated at the southern margins of the Chama River, and over the contact zone limits of the northern alluvial table. Several malls are built inside the new high-standing residential zones to cope with additional commercial and public services needed as the center became overflowed with vehicular and pedestrian traffic, insufficient parking lots and the consequent pollution. The University of The Andes continues its expansion process over the northeast limit with the construction of the “La Hechicera” complex (Sciences, Architecture and Engineering) and at north with the “La Liria” complex (Economics, Liberal Arts, Law and Political Sciences), with an estimated population of 50,000 students in total, 4,000 professors and 10,000 employees. The University is the most important institution in the city, as it contributes alone with a great percentage of the population, and constitutes the principal motor of economic activity. In the 80’s decade, new apartment buildings (usually ten-stories) are built near the connection bridges over the flanks of the Americas Avenue; this activity is still in progress now. Through the last two decades, growth of the city has been performed at the northwest and southwest limits of the city. As northwest limit confronts a natural barrier in the mountain range, greater development has been performed at southwest reaching the neighboring towns of La Parroquia (surrounding it completely) and Ejido including these two urban centers within Mérida’s metropolitan area. Growth has also been present at northeast

(with the town of Tabay and its surroundings), but in a very limited extent, as the Chama and the Mucujún rivers confluence configures a physical barrier with deep canyons and high slopes. As observed in Table 4.4, population in the State is almost duplicated and growth sustained through these three decades (1970 –1990). Average geometric Annual Rate is around two and a half percent, with a peak in the first years of the 1980's, this due to boom in oil prices around the mid 70's, allowing a very important growth in the National Budget and the consequent investments increment in the National Health System; reducing mortality and enlarging the life-expectancy of the population.

Population, Density and Growth
Census 1961 - 2001

Census	Population	Density (p/km^2)	Growth		
			Absolute	Relative (%)	Geometric Annual Rate (%)
1961 (Feb. 26)	270,668	24,0	59.558	28,2	2,5
1971 (Nov. 02)	347,095	30,7	76.427	28,2	2,4
1981 (Oct. 20)	459,361	40,7	112.266	32,3	2,9
1990 (Oct. 21)	570,215	50,5	110.854	24,1	2,4
2001 (Oct. 30)	715,268	63,3	145.053	25,4	2,1

Total surface for Mérida State is 11,300 km^2

Table 4.4: Population, Density and Growth from 1961 to 2001, after [INE, 2001].

4.8 Present Situation

The present situation for the city of Mérida is described through four different aspects: population and housing, infrastructure (public services and the principal communications facilities), health care facilities (hospitals and ambulatories), and other facilities such as governmental and educational facilities.

4.8.1 Population and housing

The political divisions of the territory and the data from the last census performed in Venezuela are used to describe the present situation in the city. The Metropolitan Area for Mérida is comprised by 15 parishes (districts) and a municipality; twelve out of the fifteen districts belong to the Libertador Municipality, three districts from the Campo Elías Municipality (Ejido town and surroundings) and the Santos Marquina Municipality (the Tabay town and surroundings). In Table 4.5, a detailed population description is given for these municipalities; it may be observed a predominance of urban population in all parishes, with a lower boundary of 94.49% and a half of all districts with a 100% of urban population. Total population for the Metropolitan Area of Mérida is estimated in 284,883 inhabitants [INE, 2001].

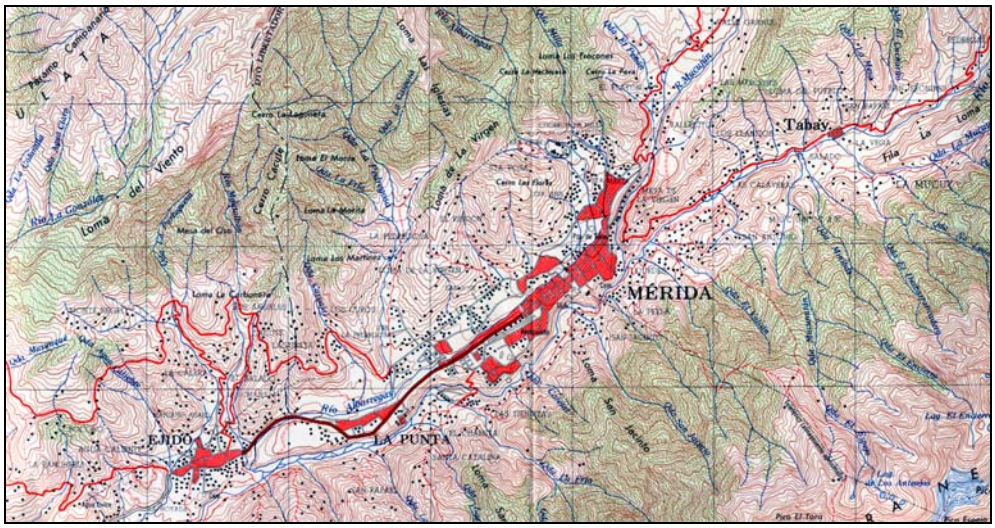
In Map 4.8, the Metropolitan Area for Mérida is shown; this area is comprised by the towns of Ejido and La Punta (southerly Mérida), as well as the city of Mérida and the northerly town of Tabay. Road connections are produced, southerly (Mérida, La Punta, and Ejido), by means of the Andrés Bello Avenue, and northerly (Tabay) by the Pan-American road. It is an important remark, that the roads described above have, at least, one bridge between the urban centers connected.

Municipality	Parishes	Rural		Urban		Total People
		People	%	People	%	
Campo Elias	Fernández Peña	814	5.51	13,958	94.49	14,772
	Matriz	81	0.22	37,174	99.78	37,255
	Montalbán	103	0.47	21,592	99.53	21,695
Libertador	Antonio Spinetti Dini	0	0.00	26,463	100.00	26,463
	Arias	24	0.18	13,446	99.82	13,470
	Caracciolo Parra Pérez	0	0.00	10,611	100.00	10,611
	Domingo Peña	0	0.00	21,188	100.00	21,188
	El Llano	4	0.04	9,949	99.96	9,953
	Jacinto Plaza	681	2.62	25,275	97.38	25,956
	Juan Rodríguez Suárez	0	0.00	15,073	100.00	15,073
	Lasso de la Vega	21	0.17	12,538	99.83	12,559
	Mariano Picón Salas	0	0.00	15,253	100.00	15,253
	Milla	0	0.00	20,861	100.00	20,861
	Osuna Rodríguez	0	0.00	19,335	100.00	19,335
	Sagrario	0	0.00	6,644	100.00	6,644
Santos Marquina	Autonomous Municipality	407	2.95	13,388	97.05	13,795
Total Population		**2,135**		**282,748**		**284,883**

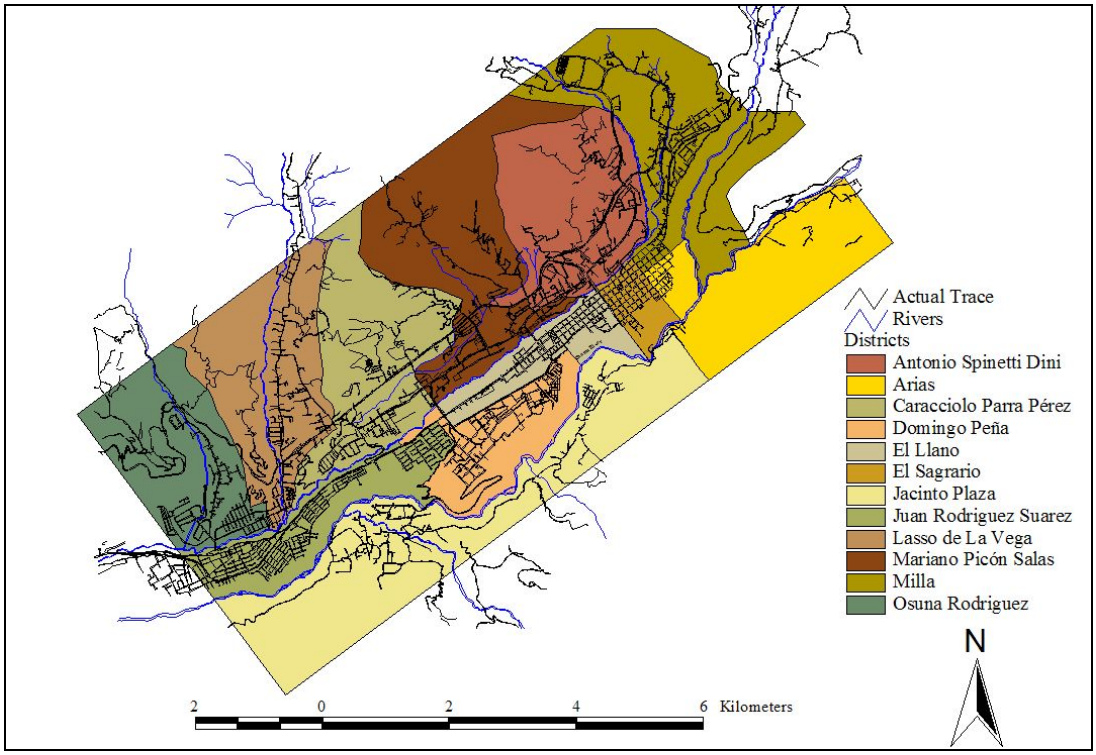
Table 4.5: Population for Municipalities in Mérida's Metropolitan Area, after [INE, 2001].

The parishes inside Mérida's Tableau are shown in Map 4.9, it must be clear that because of data availability, and the interest zone delimited for this research, the different parishes have been limited to the coverage of the maps used. Therefore, although a limit appears as a rectangle surrounding the tableau, the real limits are beyond the surface of the maps available from [MINDUR, 1992].

The twelve parishes in the Tableau are those from the Libertador Municipality, with a total population of 197,636 inhabitants, where only four of these contain rural population in a small percentage: the Arias, the El Llano, the Jacinto Plaza and the Lasso de La Vega parishes.



Map 4.8: Metropolitan Area for Mérida [DCN, 1977].



Map 4.9: Parishes in the political division for Mérida City.

The results of the National Census performed in the year 2001, describe the present situation in population and housing for the city of Mérida. Population distribution has already been described in the previous paragraphs; the housing type's distribution for the city of Mérida requires defining the housing type's classification in the 2001 National Census, which is as follows.

Housing types classification in the National Census [INE, 2001]:

- **Mansion**: construction used as a family housing built with luxury materials such as: plastered block or plastered clay brick, concrete or wood for the walls; slabs, clay tiles, or wood in the roofs; marble, granite, ceramic and parquet for the floors. This housing type has great extensions of gardens and landscaping in all surroundings, with wide spaces for familiar recreation.
- **Country house**: construction used as familiar housing, built with materials such as: plastered block or plastered clay brick, concrete or wood for the walls; slabs, clay tiles, or wood in the roofs; granite, or ceramic for the floors. This housing type generally presents gardens.
- **House**: construction used as familiar housing, built with materials such as: plastered or unplastered block or clay brick, concrete, wood, plastered or unplastered earthen walls (adobe, tapia or bahareque) for the walls; slabs, asbestos sheeting, metallic sheeting, or clay tiles for the roofs; and ceramic, granite or cement in the floors. Included in this housing type are the traditional Tapia and clay tile roof housing, houses built in modern materials, rural housing from the Ministry of Health, housing from the National or Regional housing institutes, and the non-engineered housing in the "Barrios".

- **Apartment in Buildings**: space used as familiar housing, forming part of the structure of a larger building with common access and circulation spaces.
- **Apartment in House**: space used as familiar housing, forming part of the structure of a house or country house, with independent sanitarian installations (bathroom and kitchen) and access.
- **Rancho**: construction used as familiar housing, built with waste materials (aluminum sheets, cardboard, sticks, and any other waste material available in urban areas) with a very low quality of workmanship.

The housing type's distribution, as percentage of all the housing units, for the parishes in Mérida's tableau is shown in Figure 4.1. Predominant types for the parishes are "House" or "Apartment in Building", except for the Juan Rodríguez Suárez parish, in which the "Country House" type represents around 50% of all the housing units. The "Apartment in Buildings" housing type is representative for the parishs: Antonio Spinetti Dini, El Llano and Mariano Picón Salas, with between 57.5% and 68% of all the housing units. For the case of the parishes: Arias, Milla, Domingo Peña and Jacinto Plaza, the predominant housing type is that of "House" with over 57% to 87% of all the housing units. The rest of the parishes: El Sagrario, Osuna Rodríguez, Lasso de La Vega and Caracciolo Parra Pérez, are almost balanced in percentages between "House" and "Apartment in Building" housing types, but adding between the two types more than 80% of all the housing units.

In Table 4.6, the distribution of housing units, by housing types, is shown. The most populated parishes are: the Antonio Spinetti Dini (8,323 housing units), the Jacinto Plaza (6,600 h.u.), the Milla (5,544 h.u.) and the Domingo Peña (5,304 h.u.) parishes. The rest of the parishes are below 4,834 housing units, being the least populated the El Sagrario parish with 2,010 housing units.

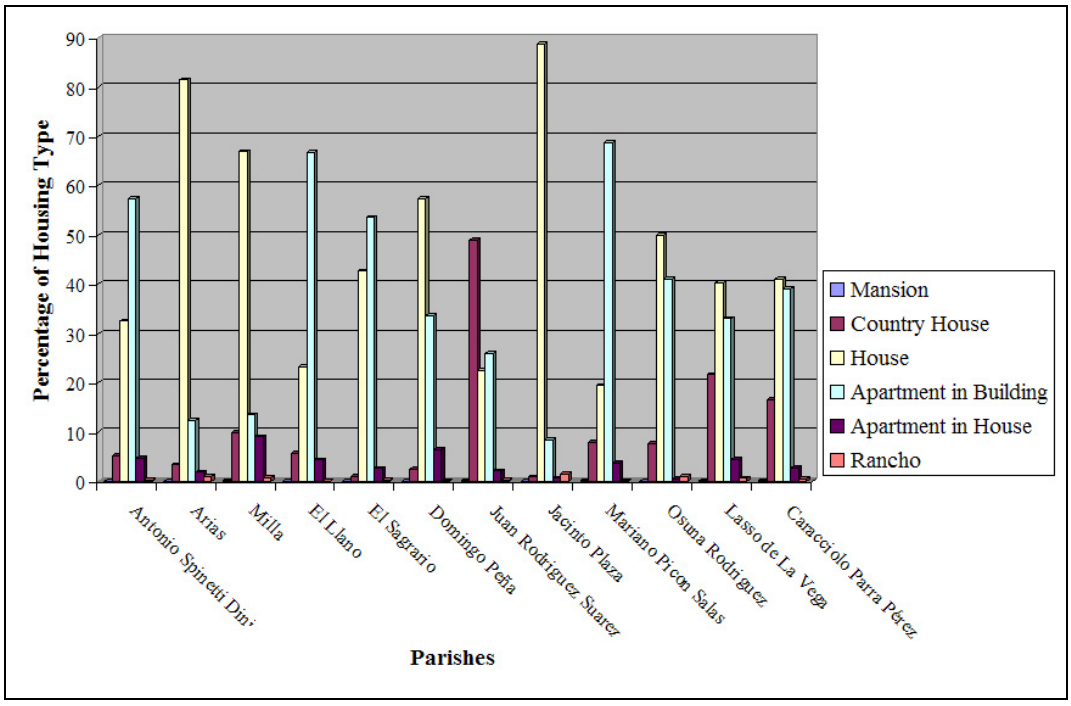
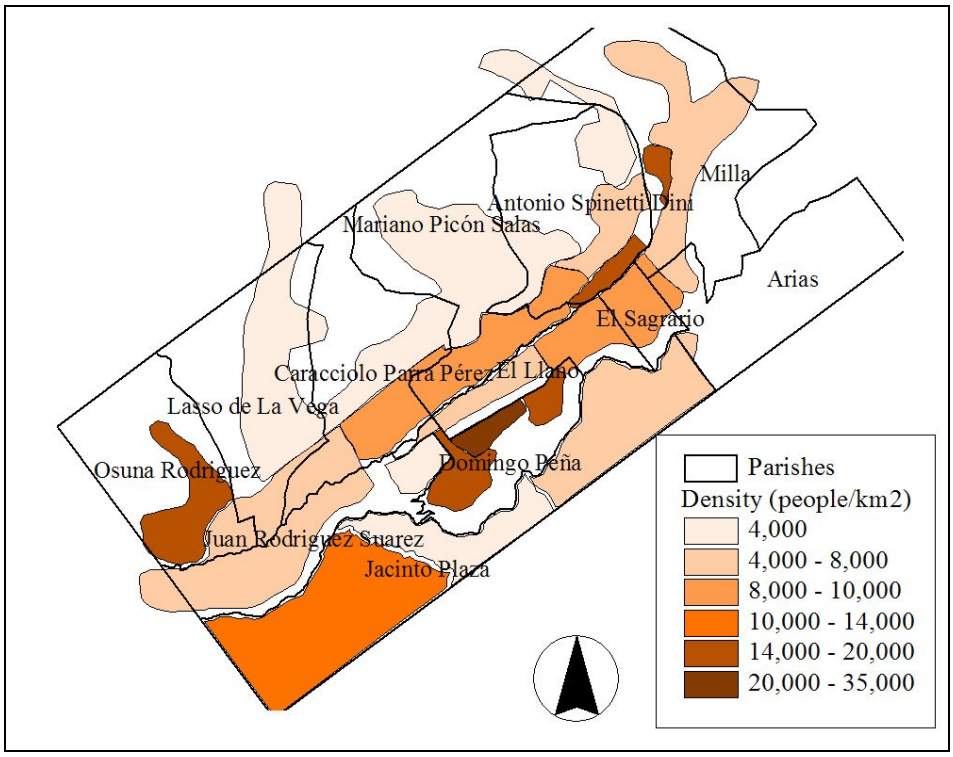


Figure 4.1: Percentage of Housing Types by parishes, after [INE, 2001].

Parish	Mansion	Country House	House	Apartment In Building	Apartment In House	Rancho	Total
Antonio Spinetti Dini	1	428	2,708	4,778	392	16	8,323
Arias	0	117	2,895	441	65	34	3,552
Milla	6	544	3,709	746	499	40	5,544
El Llano	0	182	749	2,146	138	0	3,215
El Sagrario	0	21	857	1,076	52	4	2,010
Domingo Peña	0	126	3,045	1,787	339	7	5,304
Juan Rodríguez Suárez	5	1,956	900	1,035	84	10	3,990
Jacinto Plaza	0	54	5,857	555	38	96	6,600
Mariano Picón Salas	5	385	938	3,324	176	6	4,834
Osuna Rodríguez	2	394	2,584	2,118	24	48	5,170
Lasso de La Vega	3	778	1,447	1,185	161	20	3,594
Caracciolo Parra Pérez	2	516	1,282	1,221	84	15	3,120
						Total Housing Units in all parishes	55,256

Table 4.6: Distribution of housing units by housing types for the parishes in Mérida's tableau, after [INE, 2001].

The densities inside Mérida's tableau are shown in Map 4.10, where the densest location belongs to the Domingo Peña parish with densities ranging from 14,000-20,000 people/km^2 to 20,000-35,000 people/km^2 (lilac-pastel and red-pastel areas, respectively). Following a decreasing order, the Antonio Spinetti Dini, the Milla and the Osuna Rodríguez parishes contain locations with densities up to 20,000 people/km^2. These locations (lilac-pastel and red-pastel areas) configure settlements identified as "Barrios", informal urban settlements with a low-income population, comprised mostly by non-engineered buildings for housing. The development of the "Barrios" began around the 1960's and has maintained a constant growth since then, increasing the density inside the parishes. The exception for density is that of the Jacinto Plaza parish, which although having the second greatest number of housing units (6,600), maintains densities within an upper range of 14,000 p/km^2, this due to the greater land-surface available.



Map 4.10: Population density inside the tableau, after [MINDUR, 1992]

4.8.2 Infrastructure

Public services, such as Water Supply, Electricity Supply, Domestic Sewage and Telephone for each of the parishes, are described in the last National Census. This information is described by the different definitions proposed in the 2001 National Census [INE, 2001], for each of the services available. These services are:

- Water Supply: consists in the supply of potable water to the housing infrastructure. This service is supplied in four different manners:
    - Pipe or Aqueduct: water is supplied directly inside the housing unit by means of a pipe belonging to an aqueduct, from a municipal or state water company.
    - Pumping Well: water is supplied directly inside the housing unit by means of a pipe connected to a pump in a well, usually does not belong to any company or institution, but to the collectivity.
    - Protected Water Spring or Well: water supply is performed by means of a spring or well, but without connection to the housing unit. The water must be transported by containers inside the housing unit.
    - Public Fountain: water is supplied in a public space, where the water belongs to an aqueduct, but without a connection to the housing unit. Water must be transported from the public fountain to the house in containers.
    - Other Means: water is supplied by any other means different from the described above, such a water truck.

Most of the housing units are connected to aqueducts (about 90%), which implies that a water supply network exists in the city, and covers almost all of the housing units demands.

- Electricity Supply: Electricity is supplied directly inside the housing units by means of a public network, usual voltage is 120 Volts, and cables are mostly aerial, with transformation units in posts where needed. The electricity service for the parishes in Mérida's tableau is shown in Figure 4.2; the number of housing units per parish connected to the public electricity network is located in the right vertical axis and those not connected in the left vertical axis. Electricity service covers more than the 98% of the housing units in all parishes studied, for example, in the Arias parish, with 3,058 housing units connected, and 44 without connection, the percentage of electricity served housing units is 98.58% of all the units. It is verified then, by statistical data that the electricity service covers almost all housing units in the parishes belonging to the city premises.

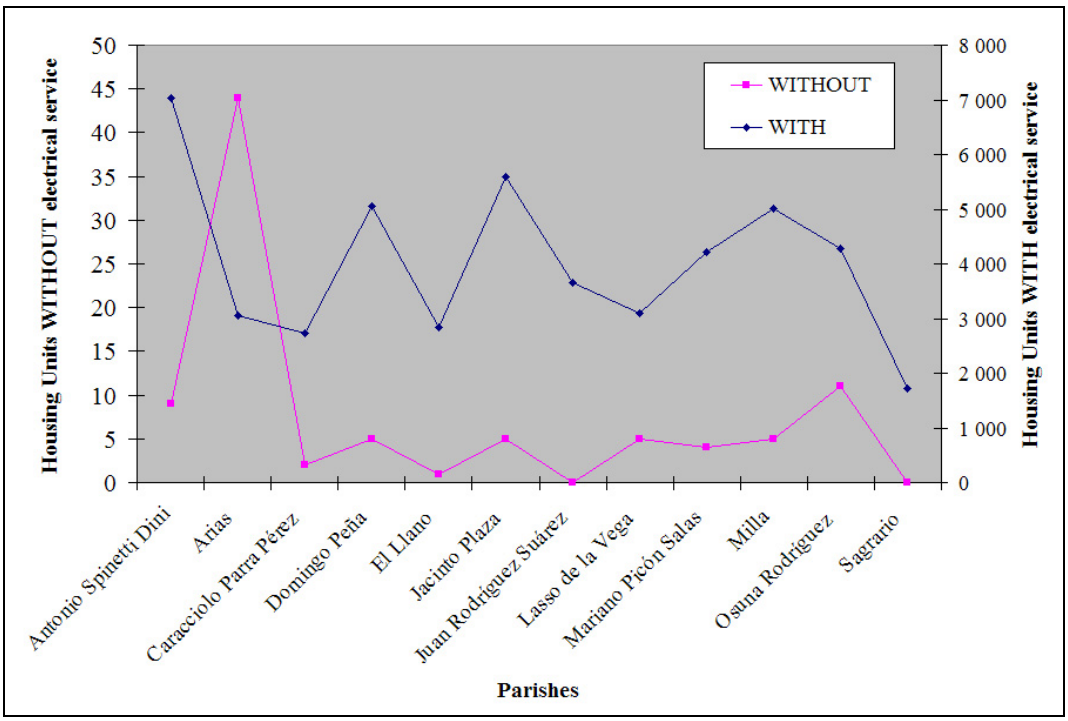


Figure 4.2: Electricity Service in the parishes studied.

- Domestic Sewage: consists in the elimination of the excretal waters from the housing units, coming from water closets mainly. Five different types of sewage are identified: Water Closet connected to a sewage system, W.C. connected to septic tank, W.C. without connection to sewage system or septic tank and Cesspool. Figure 4.3 shows the percentage distribution of the different types of sewage for the excretal waters for each of the parishes inside Mérida's tableau. The representative situation for the parishes is the elimination of excretal waters by means of a W.C. connected to a sewage system, with more than 85% in all cases. The drainage system of the city (sewage of excretal waters) covers most of the housing units in every parish; this fact implies the existence of an important sewage network in the city.
- Telephone Service: statistics in the 2001 National Census, describes the quantity of housing units connected to the telephone network. In Figure 4.4, the discrimination (in percentage) of connected and not connected housing units is shown; ten out of twelve

parishes are above 60% of housing units with telephone, while the Arias and the Jacinto Plaza parishes are around 25% and 41% respectively. The parish with the greater number of housing units with telephone line is the Juan Rodríguez Suárez parish with 83% of housing units connected to the telephone network.

From the public services observed and the percentage of housing units served by each of them in every parish in Mérida, it may be stated that the coverage of all services extend to all premises in the city, statement that implies the existence of four different service networks inside the tableau.

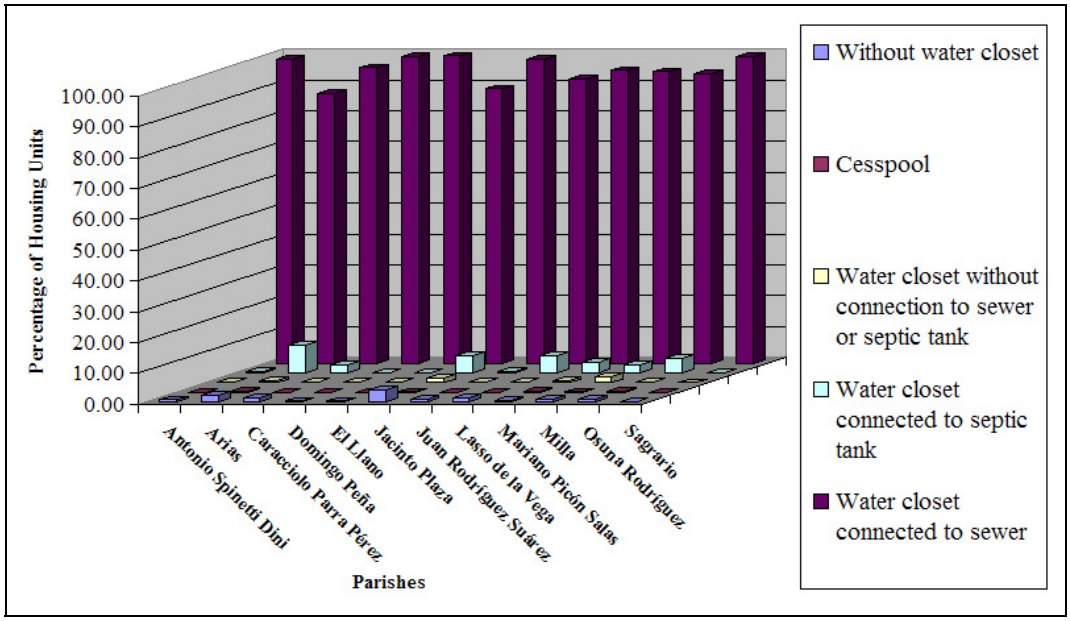


Figure 4.3: Domestic Sewage for the parishes studied.

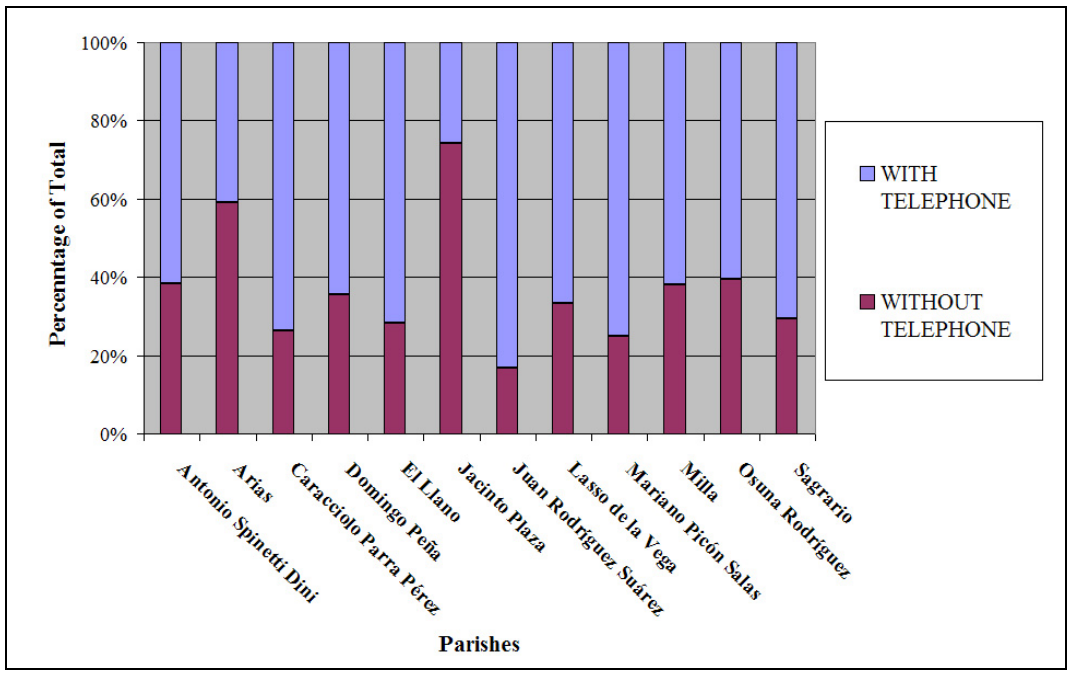


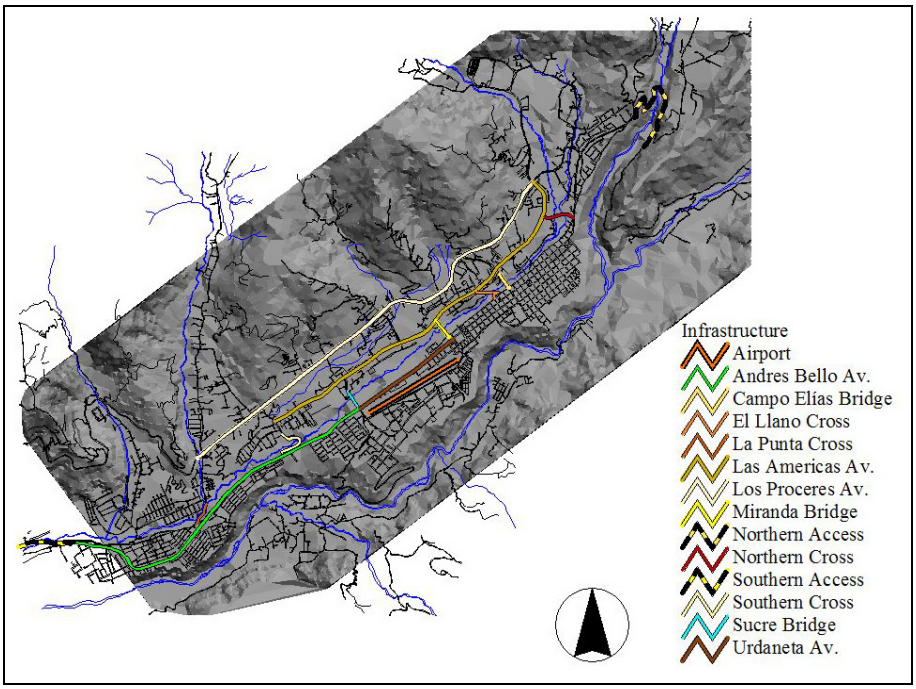
Figure 4.4: Telephone Service in the parishes studied.

4.8.3 Transportation facilities

The physical structure of the city is elongated in southwest-northeast direction, with two principal avenues: the Los Próceres and the Las Américas Avenues, at the northern side of the Albarregas River, and one at the southern side: the Urdaneta-Andrés Bello Avenues, which connect, respectively, the northwestern and southwestern premises of the city to the central portion of the tableau. Over the Albarregas River, connections between the Las Américas and the Urdaneta Avenues are produced in two different manners: through great bridges (also called viaducts, with longitudes greater than 100 m) and by means of crossing roads with small bridges (called Crosses). The number of connections is seven, three viaducts and four crossing roads with small bridges (Map 4.11). These connections have allowed the growth of the city to the northern side of the Albarregas River, where important new developments are taking place in the present. Vehicular transit through the city center (oldest portion of Mérida, downtown) is performed by means of the avenues and streets in the trace; usually both are 7 to 8 m wide single-track roads with small sidewalks (not wider than 1.20 m). The codification for vehicular ways is: Avenue, in the southwest-northeast direction; and Streets, in the perpendicular direction to avenues.

Vehicular access to the city is performed by the Pan-America Road, which at the north connects the city with the town of Tabay, and at the south with Ejido City. Northern access is a two-lane road, and the southern access is a four-lane avenue. All accesses have bridges at less than one kilometer of the city's premises, northerly, over the Mucujún River and southerly over the Albarregas River.

Aerial access to the city is performed through the city's airport, running parallel to the northern flank of the Urdaneta Avenue, with the aerial terminal over this avenue. The airport is used for domestic and commercial flights of small planes and as a strategic-military air communications facility (when needed).



Map 4.11: Transportation facilities in Mérida.

4.8.4 Health Care Facilities

The Health Care facilities in Venezuela are classified into two general categories, ambulatories and hospitals. Ambulatories only attend first aid assistance and general medicine, without hospitalization beds; the sub-classification depends on whether it is urban or rural, the population coverage, and the level of attention (Table 4.7). Hospitals attend ambulatory and hospitalized patients; four different types of hospitals exist, depending in the number of beds, services offered and the level of specialization. Level IV is the highest level hospital. Level I is the lowest (see Table 3.7).

Health Facility		Attention Level	Service Area (people Nº)		Nº of beds
Category	Type		Direct population	Indirect population	
Hospital	IV	1, 2 and 3	100,000	1,000,000	> 300
	III	1, 2 and 3	60,000	400,000	150 – 300
	II	1, 2 and 3	20,000	100,000	60 – 150
	I	1 and 2	20,000	60,000	20 – 60
Urban Ambulatory	III	1 and 2	25,000	100,000	0
	II	1 and 2	20,000	50,000	0
	I	1	10,000-20,000	0	0
Rural Ambulatory	II	1	1,000-10,000	0	0
	I	1	< 1,000	0	0

Table 4.7: Classification for Health facilities in Venezuela, after [Cedres de Bello, 1994].

The attention level implies the medical attention service by levels of complexity, ranging from general-basic medical attention to specialized services, according to this, each health care facility serves a community with attention level 1. Each specialty ambulatory serves a sector (a group of communities) where patients are referred from the lower level ambulatories. Hospital area is comprised by a set of ambulatory sectors where patients are referred to a hospital. In Table 4.8, the attention levels and its characteristics are shown.

Attention Level	Medical Attention Scope	Attention	Specialties
1	General, Basic	Ambulatory (diagnosis, observation, treatment)	General Doctor
2	Specialized	Ambulatory and hospitalized	Internal Medicine, Dermatology, Urology, Gynecology, Cardiology, Traumatology and Orthopedics, Otolaryngology, Ophthalmology, Psychiatry, Radiology, Special Obstetrics, Special Pediatrics, Dentistry and Laboratories
3	Specialized	Ambulatory and hospitalized	Same specialties in level 2 but with specialized laboratories such as Nuclear medicine, Computerized Axial Tomography and Colonoscopy, etc.

Table 4.8: Levels of attention in health facilities for Venezuela [Cedres de Bello, 1994].

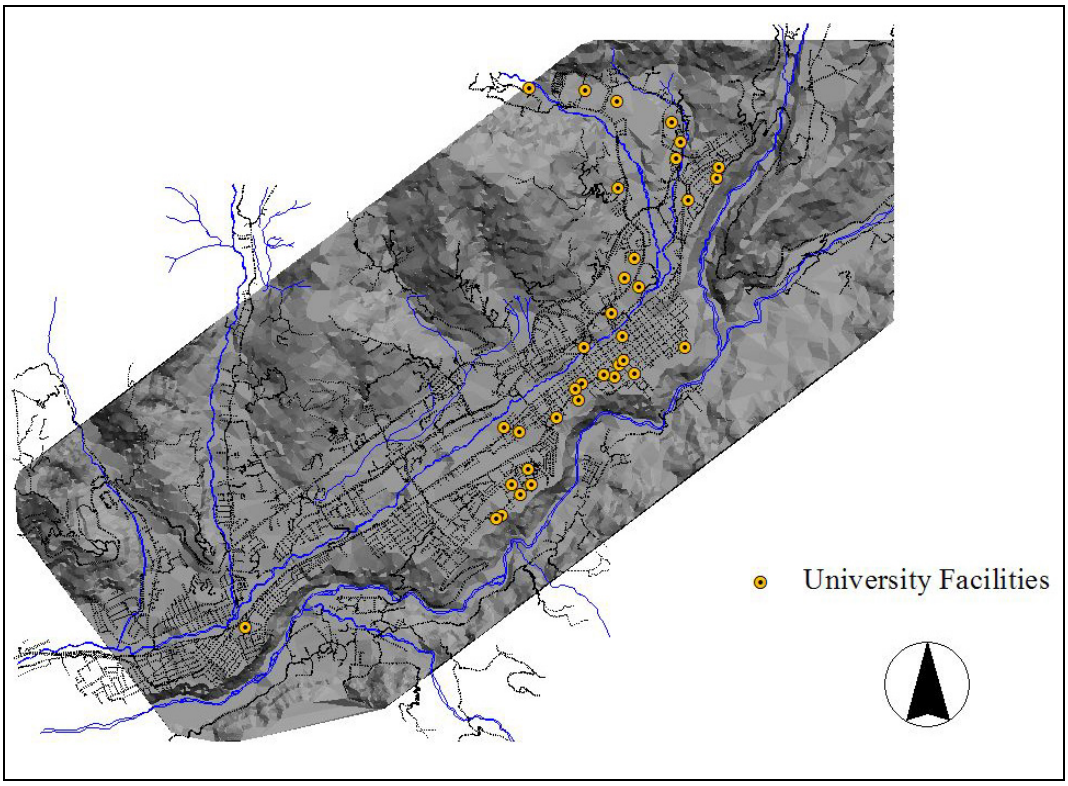
Parish	Health Care Facility Type					
	Ambulatory Type I	Ambulatory Type III	Hospital Type I	Hospital Type II	Hospital Type III	Hospital Type IV
Antonio Spinetti Dini	-	1	1	-	-	-
Arias	-	1	-	-	-	-
Milla	6	-	-	-	-	-
El Llano	3	1	-	1	-	-
El Sagrario	1	-	-	-	-	-
Domingo Peña	1	1	-	-	-	1
Juan Rodríguez Suárez	2	-	-	-	-	-
Jacinto Plaza	1	-	-	-	-	-
Mariano Picón Salas	1	1	-	1	-	-
Osuna Rodríguez	2	1	-	-	1	-
Lasso de La Vega	-	-	-	-	-	-
Caracciolo Parra Pérez	2	-	-	-	-	-
Total By Type	**19**	**6**	**1**	**2**	**1**	**1**

Table 4.9: Health Care Facility Types by parishes, after [venezuelasaludable, 2003].

4.8.5 Other Facilities

The city of Mérida, as state capital, concentrates the administrative and political activities of the regional government, and the regional headquarters of almost all national institutions. From the headquarters of these institutions, the most important for this research are those in charge of security and protection, as the City's Fire Department (local institution), the Civil Protection Headquarters (national institution), the INPRADEM (Protection and disaster management institute of Mérida State) and the Army Regional Headquarters (national institution). These four institutions have the responsibility to manage emergencies and protect the population in the State against all possible risks.

As said before, a major public national university (University of The Andes) is very important in the city, as its campus is disseminated over the premises with a great quantity of buildings and occupying an important part of the population. In Map 4.12, locations for the university's dependencies are shown. Total present estimated population for the university is around 50,000 people, including students, workers, employees and professors. As the population in Mérida city is around 200,000 inhabitants, the university contributes with a 25% of this population, being the most important source of activity in Mérida. The University counts with its own hospital (CAMIULA, Hospital Type II); the University hospital (Hospital Type IV) also accounts for its infrastructure. The University of The Andes has a fire protection and rescue unit, called the University Fire Department.



Map 4.12: University of The Andes facilities location in Mérida City.

4.9 Summary

Venezuela is a country that although containing many geographical features, from deserts to jungle, and from extended plains to steep slope mountain ranges, most of the land is unused, and the urban population concentrates over less than the 25% of the total surface. Population concentration is produced over an arch comprised mostly of mountain chains crossing the country with a southwest-northeast orientation, in the western side, and with an east-west orientation in front of the central and eastern coasts in the Caribbean Sea. Total estimated population for Venezuela is around 20 million people, where almost 20% accounts for urban population in the capital city of Venezuela (Caracas, in the central mountain range in front of the Caribbean Sea).

The growth of Mérida city has taken around 500 years; with different paces in its different stages. Since its foundation in 1559 until the 20th century, growth maintains a small rate. The most important expansion moment is the second half of the 20th century, when the leap in population increase (almost the double in previous historical growth) is very important and belongs to an era of progressivism marked by a new paradigm in governmental politics (health care, education, distribution of oil-wealth in population). This growth outstand a change in governmental practices, from a dictatorship government (late 50's) to a full democracy government (1958 to 1998). In this stage of growth, the city of Mérida becomes the capital city of a region that although not participating directly in oil exploitation, indirectly received the benefits of development and the consequent infrastructure investments of an oil-rich country. This means that Mérida, although not rich in oil, was then developed, as a university city, where the University of the Andes bought land in the four Andean states (Mérida, Táchira, Trujillo and Barinas) to become an institution even more important than the Mérida state government.

The premises inside the Mérida's Metropolitan area (State Capital) contain the most important parishes of the state, with most of the urban population, accounting for more than the 30%

(282,748) of total inhabitants in Mérida state. Inside Mérida's plateau, twelve parishes are identified and described as the most populated in the state, and are used in this research as the territorial units for the study zone. The parishes inside the plateau's premises are thoroughly served by public services, such as: water supply, electricity service and domestic sewage, which cover more than an 80% of total housing units within the parishes, with characteristics identifying a well served urban settlement (in quantity and quality) and the existence of public service networks covering the plateau's premises.

The housing units' distribution in the twelve metropolitan parishes in the study shows a predominant feature in "House" and "Apartment in Building" housing types. The "House" type predominates in the densest zones of the city, configuring settlements called "Barrios". These settlements configure, as the interest of this research is risk assessment, the cornerstone of urban population, as it concentrates the most densely populated zones with the most officially unattended social sector in the city, i.e. informal urban settlements with a low-income population, comprised mostly by non-engineered buildings for housing.

Health care facilities are described and identified for the parishes inside the tableau's premises. Regarding the classification and population covered for each of the facilities types described and its distribution, Mérida city seems to be covered in health care assistance, if normal conditions are sustained. Further examination of capacities, feasibility and operability has to be evaluated in order to establish the possible response to emergencies of the health care network.

The University of the Andes represents a very important institution in Mérida's life. Almost a fourth part of total urban population in the city's premises is dedicated to academic activities (directly or indirectly) and the infrastructure of this university is disseminated all over the city.