

TRANSFORMATION OF THE URBAN MORPHOLOGY IN HISTORIC URBAN CENTRES

Case Study: The City of Granada, Nicaragua

Maria Alejandra Lopez Conrado

1. INTRODUCTION

1-1. Research Background

Historic Urban Centres (HUC) are an expression of the diversity of societies throughout history that embody the values of traditional urban cultures. In Latin American cities, the centre has followed a particular pattern that gives it an important recognition in the shaping of the urban structure. The origins can be traced back to the Law of the Indies, where the Spanish prescribed for each town a certain structure particularly focusing on the plaza, with the Church and the City Hall as key elements of the colonial Spanish-American city layout. This plan was repeated in every colonial Spanish-American city. At present, due to their historical and cultural value, the tourism industry has provoked an increasing importance for the rehabilitation of the HUCs where they remain and also represents a potential driving force in the socio-economic development of developing countries.

HUCs face therefore, a double challenge. First, although the traditional centre remained a vital cultural and historic area, with numerous churches and monuments, the environment of the traditional centre became physically degraded, damaged or even destroyed by the impact of the urban development that follows modernization everywhere. Thus, HUCs have to ensure that tourism and modernization is developed and managed in such a way that does not contribute to the deterioration of the urban environment. Secondly, they have to be able to respond to the expectations and needs of the growing number of tourists who are attracted to their varied array of cultural, entertainment and shopping attractions.



Fig. 1 Image and Location of the Case Study

1-2. Outline of the City of Granada, Nicaragua

The city of Granada is one of the first colonial Spanish-American cities founded in Central America, it is an example of a Spanish city founded on 16th century that still present till now and almost intact with its original urban structure. The HUC of Granada has the unique characteristic that up to now continues an important nucleus of administrative, economic politic and religious functions (Fig. 1 and Fig. 2).

1-3. Research Purpose

This research pursues the following three objectives:

- (1) To examine urban morphological models of colonial cities.
- (2) To clarify the geographic settings, historical development and characteristics of the colonial Spanish-American city.
- (3) To identify and clarify the present physical conditions and transformations of the case study.

1-4. Research Method

Based on the concept of urban morphology that refers to "the study of the physical fabric urban form, which consists of streets patterns, building sizes and shapes, architecture and density", this study is oriented to the form and structure of

The study mainly deals with the layout plan, block and lot patterns and the size and shape of traditional housing building typology

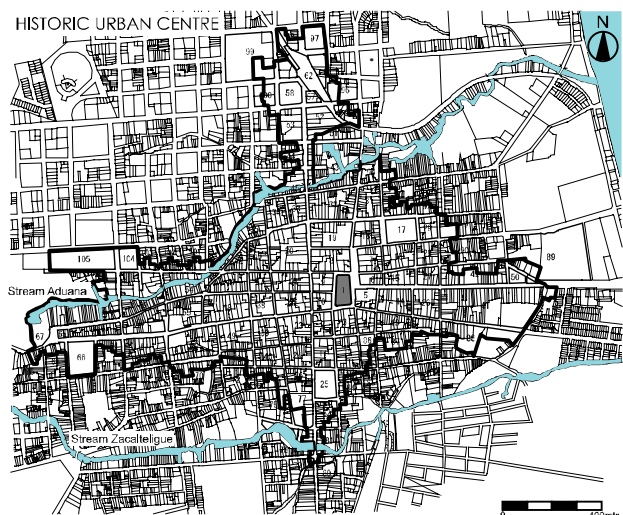


Fig. 2 Map of HUC

The field survey consisted on the collection data of the physical characteristics from HUC composed by 106 blocks (93.46 hectares). Subsequently, 69 traditional Spanish colonial houses were also surveyed to find out the different transformations on the historic urban environment.

2. TRANSFORMATION OF COLONIAL URBAN MORPHOLOGY MODELS OF ASIA AND LATIN AMERICA

The method used for this study consists in the analysis of the urban structure models elaborated by other researchers. Based on the theory that colonial cities do share similar characteristics besides the different colonizers, these models were analysed and compared among them as well as with some cases of study in order to point out common and different features.

2-1 Spatial Patterns on Asia and Latin American Cities

The most obvious effects of European and later United States expansion in developing countries were the creation of new cities, the generation of new urban forms, and sometimes the destruction of previous existing urban cultures. Most of these cities has the common feature of a previous colonial status and the urban pattern of them depends on the colonies of which they were a part of (Table 1).

Representative Models	Zones								Observations		
	Core	Residential Zones			Other						
	Port	Fort	CBP	CB2	European	Black	Chinese	India	Gov.	Industry	Market
<p>South Asia Brown and Williams, 1983</p>	○	○	○	○	○	○	○	○	○	○	○
<p>South East Asia Mc Gee, 1967</p>	○	○	○	○	○	○	○	○	○	○	○
<p>Latin America Griffin and Ford, 1980</p>	○	○	○	○	○	○	○	○	○	○	○

Table 1 Common Characteristics of Models

2-2 Transformation of the Urban Morphology Models

(1) South and Sout-East Asian City Model

South Asian cities were originally built with a walled fort. The western style CBD and distinct commercial segments have been developed according to whether the entrepreneurs are Chinese, Indian or European. In the case of South-East Asian cities, the concept was commercial centre rather than military. In order to control the economic role of the urban population, segregation policy of dwellings areas was implemented. On 20th century modernization process had been taken place in port cities starting by urban infrastructure revolutions. More rational functional and economic principles had replaced racial principles in the urban morphological organization (Table 2).

Period	Urban Development	Urban Morphological Model	Concept	Symbol	Urban Growth	Architecture Style	Means of Transportation
Early 17th century	Early Colonial Period		Semi-circular around a fort and castle	Walled forts and castles	Natural	Medieval	Cart, horses
18th century	1st Stage of Urbanization		Semi-circular around a fort and castle	Walled forts, castles and churches	European immigration and trade activities	Baroque, Renaissance, Colonial	Cart, horses
19th century	2nd Stage of Urbanization		Semi-circular expanded	Open spaces	Increasing of British companies	Classicism, Neo-colonial	Introduction of trains, cart and horses
20th century to present	3rd Stage of Urbanization		Sprawl	Apt. buildings, Shopping malls, Business parks	Rapid growth, development of population, commerce and industry	Modern and Post-modern	Cars, urban and sub-urban public transportation, se-ways and high-ways

Table 2 Transformation of Asian City Model

(2) Latin American City Model

During the early colonial period, the spatial pattern concept was centralized around the main plaza. On 19th century, changed to lineal with a main industrial ax. Subsequently, it changed to a polarized concept as a result of rural immigration to urban areas. The polarized concept has evolved to the present sprawl stage. The social status, previously associated with nearness to the centre of the city, became related to distance away (Table 3).

Period	Urban Development	Urban Morphological Model	Concept	Symbol	Urban Growth	Architecture Style	Means of Transportation
16th-19th centuries (1500-1820)	Early Colonial Period		Centralized around a main plaza	Central Plaza	Natural	Baroque, Renaissance, Colonial	Cart, horses
19th-20th centuries (1820-1920)	1st Stage of Urbanization		Lineal	Boulevard	European Immigration	Classicism, Neo-colonial	Street car, trains
20th century (1920-1970)	2nd Stage of Urbanization		Polarized	Upper and Lower Residential areas	Rural immigration to urban areas	Modern	Cars, urban and sub-urban public transportation
Late 20th century to present (1970-present)	3rd Stage of Urbanization		Sprawl	Apt. buildings, Shopping malls, Business parks	Internal migration	Post-modern	Sub-ways and high-ways

Table 3 Transformation of Latin American City Model

It was concluded that the period of colonization and European expansion in Asian and Latin American continents, irreversibly affected them on the shaping of cities as administrative, trading or even military centers at that time. It was also clarified that Latin American colonial cities after the natural process of transformations and the changing character, some of them still maintaining various characteristics of their colonial time prior industrialization.

This aspect is considered as a fundamental base that throughout the process of urbanization and urban growth from 16th century onwards was determinant in the re-shaping and transformations of them.

3. AN APPROACH TO THE COLONIAL SPANISH-AMERICAN CITY LAYOUT

On this study was considered the case study of the city of Granada, Nicaragua. It is focused on the comparison between the implementations of the Law of the Indies and the present urban structure of the city.

3-1 Definition of Colonial Spanish-American City

The colonial Spanish-American city was a self-governing polity set up in 16th century with local councilors in charge of running an urban center and extensive hinterland populated by Spanish settlers, Indian villages and the unofficial communities sprang up in countryside¹.

3-2 City Planning Principles of the Colonial Spanish-American Cities

These principles are called "The Law of the Indies" and are considered one of the most important documents in the history of urban development. The fact that almost without exception they were followed in the construction of so many towns throughout the Spanish possessions in the Americas makes them doubly significant. The laws contained instructions for sitting, laying out, and building new towns that were implemented either partially or fully over three centuries. It has been argued that these regulations grew out of the experience gained on city planning of forts.

3-3 Comparative Analysis on the Implementation of the The Indies Law in the Case Study

(1) Site Selection

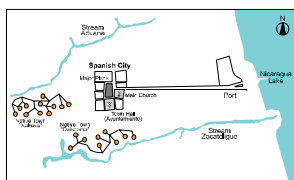
"It had to be in an elevation with means of fortification and fertile soil, plenty of land for farming, fresh water as well as native population". The site selection of Granada corresponded to the location of Nicaragua Lake and its connection with the Atlantic and Pacific Oceans as an important commercial route (Fig.2).



Fig. 3 Site of Granada

(2) City Structure

Fig. 4 City Structure of Granada

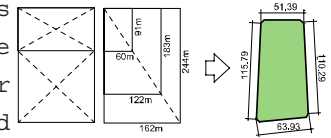


The Major Plaza has to be the starting point for the town, surrounded by the most important religious, government, commercial buildings and the upper class houses. The middle and the low income groups were located in the periphery (Fig. 3).

In Granada, the Spanish city was separated from the native settlements, avoiding contact in so far as possible (Fig.3).

(3) Major Plaza

The size of the Major Plaza should be proportioned to the number of inhabitants, contemplating the intention of native towns that they would increase. The plaza should not be less than two hundred feet in width and three hundred feet in length (Fig. 4). The Major Plaza of Granada almost followed the minimal dimensions prescribed in the Law of the Indies, but with an irregular rectangle shape surrounded also by irregular blocks. Fig. 5 Dimensions of Major Plaza



(4) Distribution of Streets from Major Plaza

"Emanating from the plaza should be four principal streets, one from the middle of each side as well as two from each corner (for a total of twelve)". The city of Granada has nine, two of them from the middle of east and west sides and the remaining seven from the corners of the plaza (Fig. 5). This injunction was not routinely followed, since it would have limited the size of government and religious buildings at the main plaza. Most of the streets of Granada are wide, contrary to the regulations for hot places like Nicaragua (Fig.5).

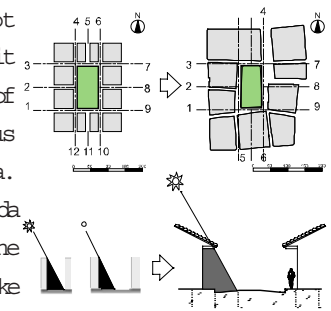


Fig. 6 Streets Characteristics

From this analysis, it is concluded that most of the main city planning ordinances such as site location, city structure, the major plaza and the distribution of streets were useful keys for the city design but not fully implemented on every Spanish-American city. Nevertheless, the Law of the Indies worked out as guidelines for the shaping and design of what the Latin American continent is now by making use of the grid pattern layout on creating a sense of place and future expansion.

4. ANALYSIS ON THE TRANSFORMATIONS OF BLOCK, LOT AND TRADITIONAL SPANISH COLONIAL HOUSING TYPOLOGIES

4-1 Blocks Typology

(1) Representative Block Proportions

The original block proportions were a square shape (84m x 84m), initially divided into four plots but, soon divided into narrower plots (Fig. 6).

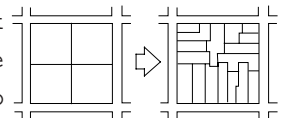


Fig. 7 Block Proportion

(2) Block Typology by Shape

It was clarified that the grid pattern layout of Granada is composed by irregular blocks with different shapes and

dimensions. Based on the Law of the Indies block patterns, the typology of block transformation was built and found out nine different types. It can be suggested that due to various destructions of the city on different periods of time, the original morphology was altered after being rebuild consecutively (Table 4).

Law of the Indies

New Types

TYPE A-1	TYPE B-2	TYPE B-3	TYPE C-4	TYPE C-5	TYPE C-6	TYPE C-7	TYPE C-8	TYPE C-9
Square Shape Quantity: 25%	Square Shape Quantity: 33.03%	Square Shape Quantity: 11.57%	Rectangular Shape Quantity: 31.33%	Rectangular Shape Quantity: 21.1%	Triangular Shape Quantity: 1.61%	Triangular Square Shape Quantity: 3.85%	Triangular Rectangular Shape Quantity: 1.02%	Irregular Shape Quantity: 5.77%

Table 4 Block Typology by Shape

(3) Block Typology by Visual Elements

This typology was built based on Kevin Lynch's theory of Good City Form about "legibility of the cityscape". Some elements of the urban structure that create a visual image such as square, landmarks, city edges and street segments were used for this typology, five types were identified (Table 5).

TYPE A	TYPE B	TYPE C	TYPE D	TYPE E	TYPE F
Along the Streets	With Returning Paths	With Landmarks	Landmark	With Central House Heritage	Regular Blocks
Quantity: 30%	Quantity: 20%	Quantity: 15%	Quantity: 10%	Quantity: 25%	Quantity: 10%

Table 5 Block Typology by Visual Elements

4-2 Lots sub-division Typology

The HUC of the case study has a total of 1764 lots. The lot area average is around 250m² located at the peripheral area of the HUC. Those lots with an average area up to 1000m² are located at the central area of HUC. These findings show up that the original urban structure and the spatial distribution concept based on the hierarchy and social status still present up to date. Seven types of lot were found out based on the shape, area and location within the block (Table 6).

TYPE A	TYPE B	TYPE C	TYPE D	TYPE E	TYPE F	TYPE G
Interior Lot Type	Corner Lot Type	'L' Lot Type	'U' Lot Type	Front 'L' Lot Type	Three Portages Lot Type	Block Type
Quantity: 27.2%	Quantity: 18.1%	Quantity: 6.2%	Quantity: 1.2%	Quantity: 2.2%	Quantity: 2.5%	Quantity: 2.2%

Table 6 Lot Typology

4-3 Traditional Spanish Colonial Housing Building Type

(1) Housing Typology

The housing type of Granada can be described as a succession of volumes from the street to the back of the building without front or side setbacks from the property lines. The main element is the courtyard. Based on the number of courtyards the housing typology was built. Table 7 Housing Typology

Corner Lot Type	PLAN	ELEVATION	INTERIOR
TYPE A			
TYPE B			
TYPE C			
Interior Lot Type	PLAN	ELEVATION	INTERIOR
TYPE D			
TYPE E			
TYPE F			
TYPE G			

Based on the field survey, it was clarified a group of houses located at the interior and corner lot with 1, 2, 3 and 4 courtyards (Table 7).

(2) Housing Transformation Typology

After being identified the typology of the traditional Spanish colonial housing, and comparing with the present physical conditions, it was also found out various types of transformations. These transformations are mainly the changing of land use and consequently changes of the internal distribution as an effect of the tourism trade.

Interior Lot Type				Corner Lot Type			
TYPE A	TYPE B	TYPE C	TYPE D	TYPE E	TYPE F	TYPE G	TYPE H
Quantity: 33.96%	Quantity: 7.62%	Quantity: 5.21%	Quantity: 8.69%	Quantity: 22.72%	Quantity: 19.25%	Quantity: 1.81%	Quantity: 0.56%

Table 8 Traditional Housing Transformation Typology

For the internal distribution of the traditional housing, eight different types of transformation were found out. Transformations of the courtyard were also analysed, and clarified six main modifications (Table 8 and 9).

TYPE A	TYPE B	TYPE C	TYPE D	TYPE E	TYPE F
Addition of Courtyard Elements	Addition of Block	Reduction of Block	Reduction of Courtyard	Reduction of Courtyard	Addition of another floor
Quantity: 7.7%	Quantity: 17.7%	Quantity: 17.7%	Quantity: 17.7%	Quantity: 17.7%	Quantity: 17.7%

Table 9 Courtyard Transformations

From this analysis of block, lot and housing transformations, it is concluded that besides this physical changes Granada still conserving in significantly the characteristics of a Colonial Spanish-American city up to date.

5. CONCLUSIONS

In this study we clarified that colonial Spanish-American cities have been reshaped in the process of transformation at different levels. From the first study in chapter two it is pointed out that Latin American cities at present time possess most colonial characteristics compared with the Asian colonial cities. Consequently, it was pointed out through the chapter three that the Law of the Indies were not fully implemented but up to date Granada retains the main elements of city planning that characterized the colonial Spanish-American cities. On the analysis of chapter 4, it was clarified the variations of block, lot and housing transformations. In summary, it can be concluded that in spite of these transformations the HUC of Granada demonstrates continuity and persistence of form, what represents a meaningful value at the present time.

REFERENCES

1 Urban Morphology Journal of the International Seminar on Urban Form <http://www.urbanform.org/>