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# DETERMINING FACTORS FOR THE URBAN FORM AND ITS ORIENTATION IN SPANISH COLONIAL TOWN PLANNING: PLANNING THE TOWN OF GUATEMALA IN THE EIGHTEENTH CENTURY

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In Spanish town planning during the colonial period, basic planning philosophy was often incorporated into urban designs; however, during actual construction, these ideas were rarely realised in accordance with theory. Nevertheless, some of the planning concepts developed during this period provide the basis for principles of modern town planning from the 19<sup>th</sup> century on. This article examines factors involved in the determination of town size and urban form, terms that were defined through the process of modern city planning. Using the town planning of Guatemala City in the 18<sup>th</sup> century as a case study, this paper discusses trends in practical planning methods during the colonial period. An analysis of different town plans for Guatemala demonstrates that, in town planning, an area's boundaries were typically designed as straight lines, and that its urban form was based on easily understandable elements of geometrical drawing, rather than locational or geographical features.

## **Keywords**

Spanish early modern period, colonial town planning, town shape, urban form, Guatemala, geometry, 18th century

## **How to Cite**

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## INTRODUCTION

During the early modern period, European civilizations had substantial experience in planning towns and urban development projects. The Spanish royalty in particular constructed many 'new towns' in its colonial territories. By the time of the well-known planning laws established in the 1573 *Ordinances of Philip II*, there were already more than 225 new towns constructed by Spain, and by around 1630, about 330 towns had been constructed. It is estimated that more than 900 towns were constructed over the course of the Spanish colonial period. Urban planning was a cornerstone of this rapid growth, and studying the techniques used in these processes offers a window into the nature of the Spanish colonial period.

The 21<sup>st</sup> century has witnessed remarkable and continued advancements in the digitalization of historical documents. As document storage and analysis technology develops, historical understandings about the conditions of colonial town planning management have improved also. A prime example of this can be found in the General Archive of the Indies (*Archivo General de Indias*) in Seville, Spain, which stores extremely valuable documents and visual materials, such as maps and plans of Spanish colonial towns. Such resources can provide insight into the history of the Spanish Empire in the Americas and the Philippines.

Drawing primarily on documents from the General Archive, this study examines diagrams for new town construction during the early modern period, with the aim of better understanding the practice of town planning. Previous studies have analysed the characteristics of Spanish colonial town planning through texts that outline town planning laws, such as the '*Ordinances of Felipe II (1573)*' and '*Laws of the Indies (1680)*'. This research project goes one step further, incorporating image analysis in addition to an examination of relevant texts.

The methods used in Spanish colonial town planning, such as urban form, planning of streets, blocks and squares, and scale planning are the basic principles of a form of new town planning that emerged in the early modern period. Many of these concepts, and a number of actual construction sites show evidence of a philosophy of town planning that would form the foundations of modern city planning. This paper focuses on factors that determined the size and urban form of these towns, factors that would provide better understanding the town planning methods in the 18<sup>th</sup> century.

During the Spanish colonial period, town-planning practitioners studied basic philosophy regarding the structure of urban space, but in point of fact, these theories remained unrealised in actual construction practices. The same can be found in other times and regions. For example, Renaissance Italian architects discussed the perfect geometric form at length in their discourses on Ideal Cities, and yet it is well known that towns were rarely designed to follow precise geometric forms, with the exception of cases such as the symmetrical town of Palmanova, Italy. A question arises from this history: '*How was urban form determined in the process of actual town construction?*'

## CITY BORDERS AS A DETERMINING FACTOR OF SCALE

The Spanish royalty constructed towns that were fortified with walls and featured grid planning inside the walls' borders. There are many examples of such towns, which were originally enclosed by fortified walls and bastions, such as La Habana, Santo Domingo, Panama, Cartagena, and Trujillo. Royal decrees, which outline requirements for various aspects for the planning of a colonial town, are an excellent resource for understanding the function of scale in town planning. This section highlights the under-examined relationship between walls and scale.

The *Ordinances of Philip II*, issued in 1573, which define the structure of Spanish colonial towns, state various methods of planning in detail but do not make clear declarations about the areas' urban forms. While the document assumes that new towns will be constructed, very little is mentioned about features, such as walls and scale, that should be incorporated in the construction of a new town. The *Ordinances*, which mention the securing of vacant space for development, seem instead to be concerned with establishing the initial construction in a way that can accommodate future urban expansion projects. The goal of the royal decree, then, appears to be preserving orderly continuity between the existing and expanded area [Articles 111, 129, 130 in the *Ordinances*]<sup>1</sup>. King Carlos II's representative colonial code, the *Laws of the Indies*, issued in 1680, also pays little attention to the planning of the town wall. This code contains a single provision that defines the distance between the town wall itself and houses near it [Book IV, Chapter VII, Article 12 of the *Laws of the Indies*]<sup>2</sup>.

The scarcity of attention to town wall construction in town plans may be because, while walls were necessary for defence, they were difficult to design before the actual town was constructed, and so were not included in formal regulations. A close examination of King Philip's *Ordinances* reveals that they intended for streets to be laid out in an orderly pattern that could be repeated as the town expanded [Articles 111, 117]. It could be that town wall construction was not included in the town planning code because a wall would inhibit the town's ability to expand as its population grew. This can be read as evidence that town planners were conscious of the idea of scale, particularly the way that a new town would need to expand as its population increased. Lending further weight to this proposition are documents in which the proportions of town plazas were described in reference to holiday events involving horses [Article 112], and were discussed not relation to the towns' current population levels, but to their estimated increases [Article 113].

## TOWN BOUNDARIES AND ORIENTATION IN THE THEORIES OF THE RENAISSANCE IDEAL CITY

In the theories of the Ideal City, advanced by the Renaissance Italian architects, a city's form and the orientation of its streets are highly important. The influential Roman architect Vitruvius, for example, was a proponent of the idea that towns should be planned so that the urban form and streets are adapted to suit an area's wind patterns. It is possible to understand the Vitruvian philosophy of town planning by illustrating a geometrical town model shaping a symmetrical polygon. Very few examples of cities of such polygonal shape, however, have been faithfully put into practice, and it remains unclear to what extent geometrical theories are reflected in actual town planning.

Vitruvian theory recommends a circular shape as the primary urban form [I.v.2; Book I. Chapter V, 2]<sup>3</sup>, an idea that gives priority to defence in determining the town's urban form. Vitruvius maintains his premise that the town wall is constructed as a border that divides the inside and outside of a town, and numerous chapters in his texts contain descriptions of both the interior and exterior of a fortification. He emphasizes the construction of the town wall and its gates, as well as other public facilities that incorporate defensive, religious, and practical elements [I.iii.1].

Although he does not share Vitruvius' commitment to the circular form, the architect Alberti also considers geographical conditions in the construction of town walls [IV.2, IV.3; Book IV, Section 2 and 3, of the *De re aedificatoria* <sup>4</sup>]. In his designs, town gates were limitedly opened in the walls, for improved defence [IV.5]. Alberti states that the town should be located in the centre of the territory it is constructed within, so that it is possible to view the boundary the territory from the town [IV.2]. This claim is an elucidation of the concept that the 'town' and the 'town territory' are distinct areas: that there is an area outside the town but inside its boundaries, which is the town territory.

## PLANNING FACTORS IN THE RECONSTRUCTION OF GUATEMALA CITY

More than two hundred towns were constructed in Spanish colonial territories during the first half-century of the early modern era, and the model of an urban nucleus was established during this period. In comparison with towns in the Spanish mainland, the size of the city block (the *manzana*) was considerably larger, and each lot in a given block was assigned to a particular group of settlers. Population density in these colonial holdings was low, and the towns did not have formal boundaries, a format that contrasted starkly with the military camp cities of medieval Europe<sup>5</sup>.

The 18th century, which began a century after Spain's initial colonial efforts of the 16<sup>th</sup> century, was a period when many colonial towns expanded, development an urban nucleus, or were reconstructed entirely. Overall, the scale of town blocks was reduced, and the number of town blocks inside the town area increased. Some towns during this time maintained a simple grid model, with square blocks, while others diversified from the square shape as the basic block unit. This was due in part to the growth of population and commercial activities, and quite a few cases required complete reconstruction because of natural disasters. The town of Guatemala, La Antigua, which because of an earthquake had to be relocated and reconstructed as Guatemala City, is one notable example.

YEAR	EVENTS	POPULATION
1524	Settlement at Iximché (Inland and central Guatemala) by Pedro de Alvarado (Santiago de los Caballeros de Guatemala)	120 (1524)
1527	Village relocation to the valley of Panchoy at Almolonga, Volcán de agua by competition with surrounding villages (Santiago de los Caballeros de Guatemala or Ciudad Vieja)	
1532	Ordinance of Carlos I, July 28th, gives the town of Santiago de Guatemala a title of 'Ciudad (City)'	750 (1530)
1542	September: Town was severely damaged by flood and great earthquake. Royal engineer, Juan Bautista Antonelli, proposes the transfer of the town to the government. (Some researchers suspect the involvement of Antonelli.) October: New town is planned, Antigua Guatemala or merely La Antigua, and relocation determined in 1541. Official name kept 'Santiago de los Caballeros de Guatemala'. Relocated in 1542.	500 (1549)
1573	Ordinances of Philip II, colonial town planning code of Spanish royal	2,000–2,500 (before 1570) 3,500 (1585) 5,000 (1620)
1717	August 27th –29th, September 29th: Eruptions and earthquakes of neighbouring volcano, heavy damage by Earthquake of San Miguel. Town's transfer studied to La Hermita but reconstruction selected.	
1751	March 4th. Heavy damage by the great earthquake, San Casimiro at Santiago de Guatemala.	
1773	July 29th. Catastrophic damage by Great Earthquake of Santa Marta. Request of the town relocation to Vally of La Hermita (officially 'Nueva Guatemala de la Asunción', and Guatemala City today.) December 13th. Great earthquake. Obtains the approval of the King, Carlos III, for town's relocation.	26,411 (1768–1770, La Antigua before its relocation)
1774	November 25th: Engineer, Luís Díez Navarro draws plan of La Hermita based on the survey directed by the governor, Martín de Mayorga (La Hermita, official name: Nueva Guatemala de la Asunción.	
1774	January 2nd. Official relocation date to La Hermita (takes more years for entire transfer)	5,917
1777	March 22nd. King, Carlos III issued an instruction to carry out the transfer from La Antigua Guatemala within a year.	23,434
1821	Independence	

TABLE 1 A chronological table of the town construction of the capital of Guatemala and the population (Spanish colonial reign)



FIGURE 1 Geographic plan of Guatemala City on the basis of the survey  
March 12th, 1774 (MP-Guatemala, 207)

Table 1 outlines the chronology of events that lead to the reconstruction of Guatemala City. In 1524, Pedro de Alvarado established the town of Guatemala in Iximché, a region in central Guatemala, and called it Santiago de los Caballeros de Guatemala. The town was later moved dangerously near to a volcano at Almolonga, Ciudad Vieja, and then again in 1542 to a neighbouring area to avoid risk of earthquakes and floods. The town suffered severe earthquakes in 1773, prompting King Carlos III to approve the town's relocation to the Valley of La Hermita. In 1774, plans were drawn for a new town, La Hermita, which is today's Guatemala City.

The General Archive of the Indies in Seville features a wealth of documents concerning the relocation of Guatemala City – the archive's section on the Captaincy General of Guatemala contains 418 maps and plans of the project, as well as many duplicates. Descriptions of the town area are scattered, and provide a variety of indications about what factors determined the positioning of town boundaries. Figure 1 shows a geographic map that describes the condition and boundaries of the Valley of La Hermita. In the map, open plains are represented in full scale, and the town territory and the boundaries are defined by geographical conditions such as rivers, hills, and cliffs. Interestingly, there are a few crossings of diagonals in the map, and it contains no information about those diagonals that are represented, despite the fact that the crossings are clear evidence that the engineer was attempting to locate the possible centre of the town.

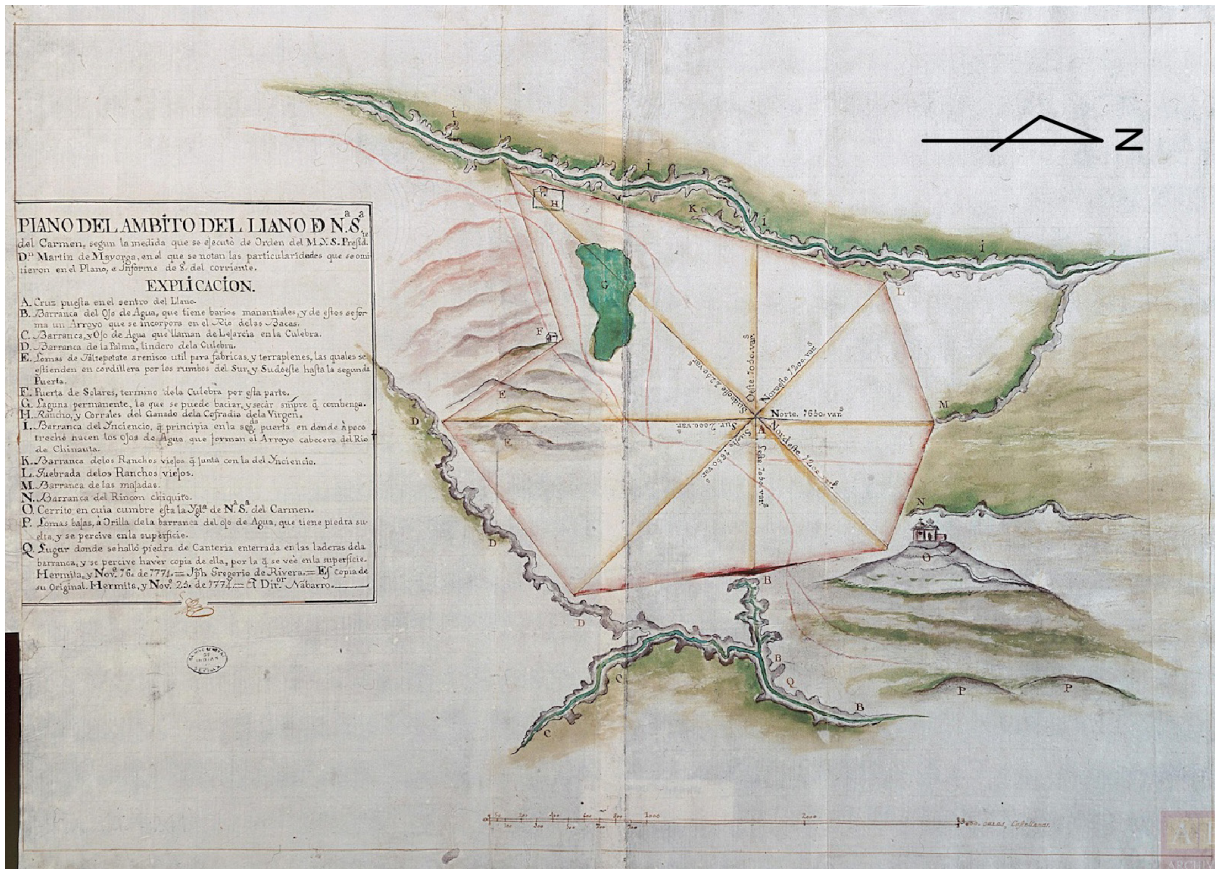


FIGURE 2 Town plan of Guatemala City, November 16th, 1774 (MP-Guatemala, 211)

## PLANNING DIAGRAM FOR THE DETERMINATION OF THE URBAN AREA

For the initiative to reconstruct Guatemala in 1774, the governor of the Captaincy General of Guatemala, Martín de Mayorga y Ferrer (1721–1783) designated an engineer, Díez Navarro y Albuquerque, Luis (1699–1780)<sup>6</sup> as the town planner for the new and permanent town of Guatemala City. Díez Navarro drew several plans for Guatemala, among which a provisional planning diagram, Figure 2, provides a helpful example of the process by which he determined the town territory. This diagram, represented in Figure 2, was drawn on November 25<sup>th</sup> of 1774 by Díez Navarro. It appears to be a rather simple diagram, but it clearly contains the town's boundary, plains, hills, rivers, cliffs, church, regulating pond, farm, and livestock farms. This indicates that the primary object of this drawing was to create a study for the determination of the town territory.

In Figure 2, four diagonal lines outline a polygonal urban area, and these lines intersect in a single point, which is the centre of the town. The diagonal lines follow the cardinal directions south, north, east and west, as well as the intermediate northeast, southeast, southwest, and northwest. Each diagonal, like that of a regular geometric octagon, extends in an almost precisely 45 degree range from the centre, and the urban area itself is demarcated by clear straight lines running between points on the diagonals.

The boundary of the town is constituted by an irregularly shaped nonagon. Eight out of the nine vertices are positioned diagonally, and only one vertex is displaced from the diagonal. Each of the eight vertices of the polygon seem to be related to the geographical conditions as drawn, and the irregular shape of the ninth vertex may have been determined to exist in a position where the town's boundary is refracted on each diagonal.

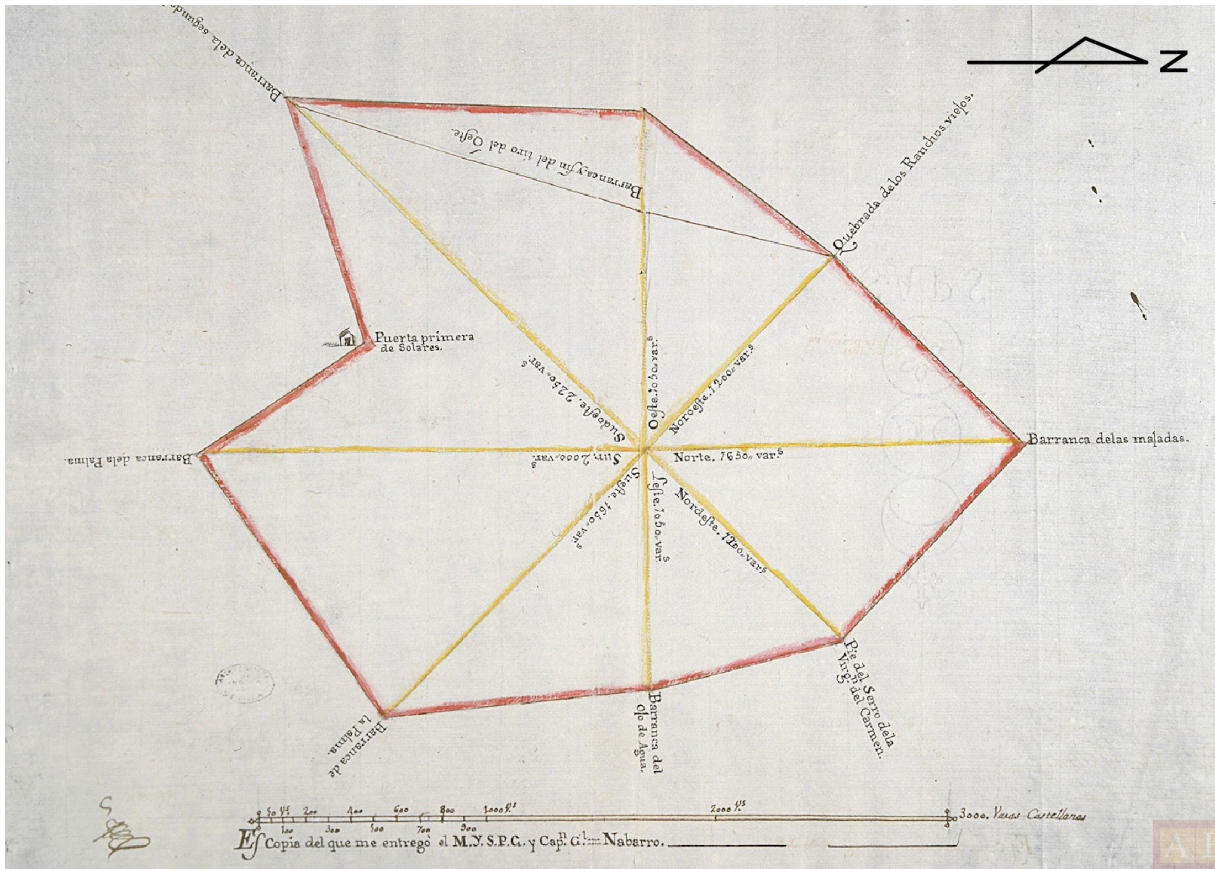


FIGURE 3 Town plan of Guatemala City, February 1st, 1775 (MP-Guatemala, 326)

The General Archive of the Indies preserves another, similar diagram, shown here in Figure 3. The diagram is a copy of an original plan for Guatemala, drawn on February 1<sup>st</sup>, 1775, from the results of a survey carried out by the engineer, José de Rivera, on November 8<sup>th</sup>, 1774.

Figure 2 and Figure 3 express the same essential plan for the new town for Guatemala, but the diagrams feature different eastern (upper, in the figure) boundaries. In Figure 2, the boundary of the urban area runs in a straight line between the northwest and southwest vertices, while in Figure 3, the boundary is bent around the west vertex. Given that the two plans refer to the same construction site in the same geographical location, the difference in the assignment of the town's boundary seems to have been determined following the plan's 45-degree division schema. The drawing therefore exhibits a strong geometrical influence in the determination the urban area's form.

## RELATIONSHIP BETWEEN GUATEMALA CITY'S THE URBAN AREA AND TOWN CORE

The diagonal lines drawn in both Figure 1 and Figure 2 converge at the town's nucleus. In the geographic plan in Figure 1, it is difficult to say which convergence signifies the final position of the town centre. However, as mentioned above in reference to Alberti's theory of urban form, the urban territory and town itself can be thought of as distinct designations, and the town planners who followed Alberti's idea believed that the town should be surrounded with plains which in total constituted the urban territory.

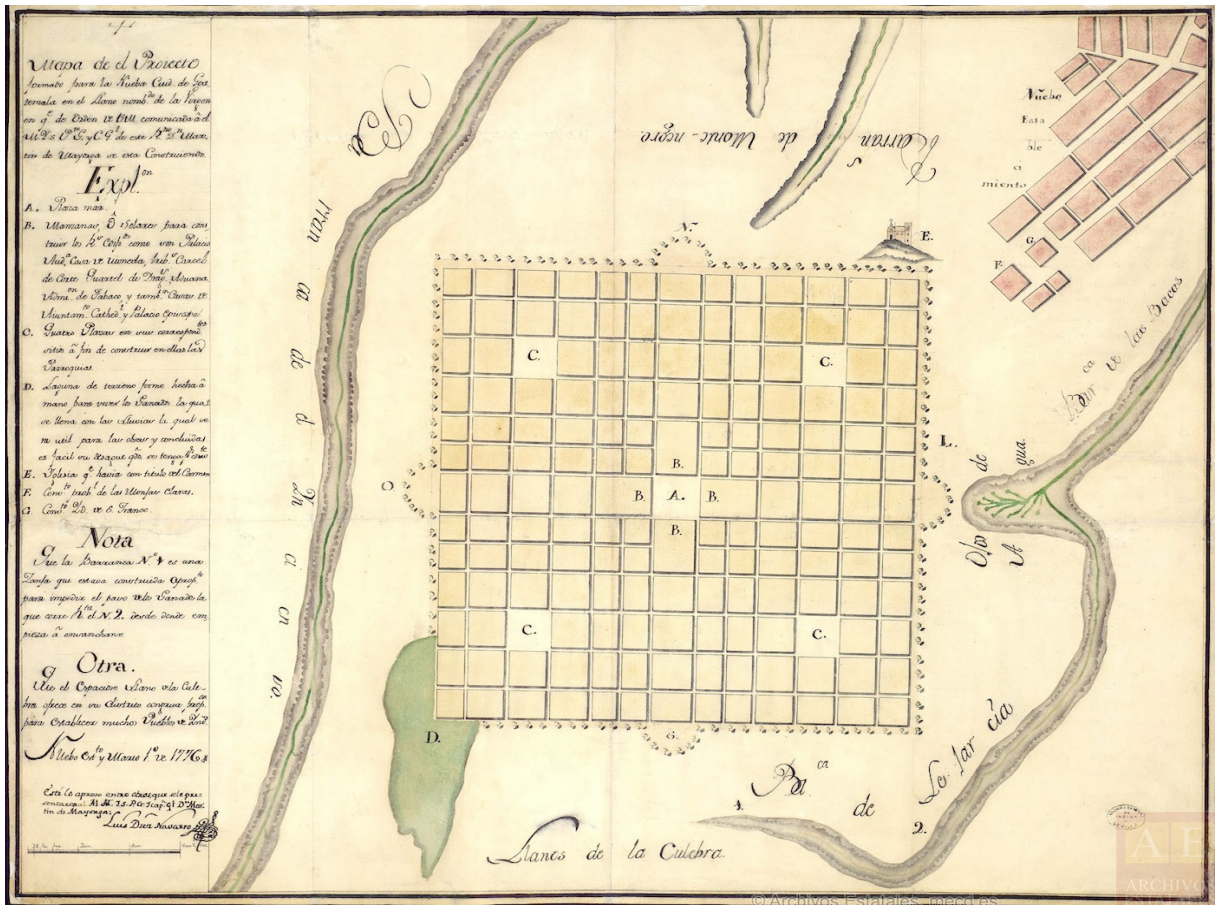


FIGURE 4 New project of town planning of Guatemala City, March 1st of 1776 (MP-Guatemala, 220)

Figure 4, MP-Guatemala 220, from 1776, shows a plan of Guatemala City's town centre, formed by an orderly grid plan, with square blocks. Despite the basic geometric forms, it is not a simple grid plan. The size of the urban area's blocks varies, the interval of the streets is different, and four district squares are distributed throughout the urban area. These designs were intended to foster the development of unique neighbourhoods, with different characteristics. The town is also square and is surrounded by trees, rivers, small mountains, and plains, rather than solid walls, which allowed it to expand as its population increased. The clear definition of the town's nucleus encourages development of the urban area outwards from the centre, onto the vacant areas, a plan that follows Alberti's theories of geometric form, as well as King Philip II's Ordinances.

## CONCLUSION

The plans for Guatemala City reflect a method used to design a new town during the Spanish colonial era. In this tradition, the urban form of the town's boundary is influenced by locational and geographical conditions, but still typically consists of straight lines. Moreover, the points along which the boundary lines are drawn are designated not by locational or geographical requirements, but rather by eight vertices that extend from the centre of the town. The urban form is determined by connecting the vertices at a central point, creating a town space in which eight directions, at 45-degree intervals, are clearly expressed. Geometric factors, in other words, are given stronger preference than geographical ones. This suggests a planning method of urban form which, by diagonally connecting the vertexes of the urban form, easily finds the local eight orientation.



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## Notes on the contributor(s)

Akihiro Kashima is a professor at the Department of Architecture, Setsunan University, Osaka, Japan. Published papers include: 'An Essay on the scale of town planning in the initial colonization found in Spanish colonial laws', *Journal of the City Planning Institute of Japan* No. 48-3, pp. 219-224, 2013 (Annual Conference 2013, Tokyo); 'Reviewing the Urban Planning History of the Spanish Colonies: Establishment of the Latin American city image', *Toshishi Kenkyu (Japanese Journal of Urban and Territorial History)* No. 2, Society of Urban and Territorial History, Tokyo, 2015. Kashima is currently researching the continuity of the planning philosophy between the early modern and the modern periods.

## Endnotes

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- 5 Terán, Fernando de (dir.), Aguilera Rojas, Javier (ed.), *La Ciudad Hispanoamericana, El Sueño de un Orden*, Madrid, 1997, p.115
- 6 Díez Navarro y Albuquerque, Luis (1699-1780) is an engineer who played an active part in military construction in Barcelona, Cádiz, Mexico among other things. Also was a military architect who contributed to the new planning of the Guatemala City.

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