The Seventeenth-century Transition of Seoul's Spatial Structure to Functional Pragmatism

Youngsang Kwon\(^1\), Bonghee Jeon\(^2\) and Saehoon Kim*\(^3\)

\(^1\)Assistant Professor of Urban Design, Department of Civil and Environmental Engineering; Integrated Research Institute of Construction and Environmental Engineering, Seoul National University, Korea
\(^2\)Professor, Department of Architecture and Architectural Engineering, Seoul National University, Korea
\(^3\)Assistant Professor of Urban Studies and Design, Department of Landscape Architecture, Graduate School of Environmental Studies; Interdisciplinary Program in Landscape Architecture, Seoul National University, Korea

Abstract

This paper explores the functional pragmatism embedded in the transformation of feudal Seoul's urban structure. Using historic maps drawn between 1751 and 1914 and an analytical method of space syntax, the paper documents changes in the distribution of major administrative buildings and streets in Seoul ("Hanseongbu") during the Joseon Dynasty. The results indicate that administrative buildings such as palaces, royal villas, economic authority buildings, and military headquarters were relocated along major commercial corridors such as Jongro and Namdaemunro Boulevard during the period. Based on a geographical information analysis, Jongro showed the highest street integration value over time, followed by the southwestern part of the city, because of the overlap between commercial boulevards and administrative buildings. The results suggest that the principle of urban design in which government districts were separated from commercial areas was incrementally abandoned during the late Joseon Dynasty. This functional merging was encoded into the shaping of contemporary Seoul instead of following the old Chinese regulation of urban-form making.

Keywords: urban history; Seoul; space syntax; urban design

1. Introduction

The Hanseongbu area of Seoul in today's South Korea served as a political, economic, and social capital of the Joseon Dynasty and the succeeding Great Korean Empire (1392-1910) for more than 500 years. In the late fourteenth century, Seoul's urban design was initiated by an autocratic royal authority that established new social norms by virtue of Confucianism. In the original plan of the city, the regime's major administrative buildings, including palaces, royal villas, economic authority buildings, and military headquarters, were located away from commercial neighborhoods and market areas. However, this functional separation started to change, first with the rise of militarism in neighboring countries such as the Toyotomi Shogunate of Japan (1592-1598) and China's Qing Dynasty (1636-1637) and then with the economic liberalization of Korea's middle class. With the extensive loss of property and a rather abrupt change in society, pragmatism appealed to early entrepreneurs, planners, and some bureaucrats in the war-damaged city.

Beginning in the seventeenth century, the notion of pragmatic urban planning started to be encoded into the urban structure of Seoul. For instance, new palaces were constructed near market places, and major commercial corridors of Jongro and Namdaemunro Boulevard were increasingly occupied by royal villas and economic authorities that were in charge of collecting and distributing commodities across the country (Kwon and Kim, 2004). A number of studies have documented the pragmatic aspects of the urban structure of pre-modern Seoul, such as the effective defensive system of a walled city and changes in the royal procession of the king (Kim and An, 2012; Song and Cho, 2012). Additionally, recent studies like Sohn et al., (2010), Jun and Yoon (2012), and Yoo and Park (2014) investigated multiple urban aspects of Seoul. However, no study has empirically analyzed the geographic relationship between major administrative buildings and the urban pattern of the city. This relationship may be best illustrated by identifying locations of individual buildings on the same map. Administrative buildings can be verified from multiple data sources, but finding the locations of individual markets has not been plausible because of the low resolution of pre-modern maps. Therefore, this paper takes a space syntax approach to document changes in the level of street integration in Seoul. Greater street integration is known to be a proxy for a site with intensive pedestrian
movements, such as main commercial boulevards and shopping areas (Hillier et al., 1993; Kim and Kwon, 2002). The paper describes changes in the urban structure of Seoul after the seventeenth century by using the space syntax method and discusses the forces underlying the city’s urban reconfiguration.

2. Research Methods

To examine the spatial relationship between locations of administrative buildings and major streets, spatial data from historic maps, master plans, and geographically rectified aerial photos were collected using a standard method for processing geospatial data (Kim and Rowe, 2013). In particular, three historic maps of Seoul produced in 1751, 1861, and 1902 provided key data. These maps had a high resolution with clearly visible outlines of urban districts, roads, major buildings, and water bodies and included the entire study area (Hur, 1994; Yang and Yi, 1995; Gyeongseongbu, 1914; Fig.1.). Old maps of Seoul were painted in a picturesque style, but the roads implied their important role in old Seoul’s urban structure. Therefore, the road network system was analyzed using the method of geographical information system (GIS). In addition, historic documents related to the planning of Seoul, including Joseon Wangjo Silok (Annals of the Joseon Dynasty) and Bibyeonsa Deungnok (Records of the Border Defense Council) dating back to the seventeenth century, were carefully investigated for circumstantial evidence of the precise location of urban construction.

However, historic maps involved substantial geometric differences in the representation of streets and buildings. For instance, a street drawn as a straight line in one map was depicted as a curved line in another. Because this could lead to discrete integration values between the same urban patterns in the analysis of space syntax, the 1914 map was chosen to make standardized axial maps of the city.

Fig.1. Old Maps of Seoul Showing the Locations of Palaces, Roads, and Streams (A: The Dosung Samkunmun Bungoejido Map of 1751; B: The Daedong Yojido Map of 1861; C: The Hanseongbu Jido Map of 1902; D: The Seoul Map of 1914; E: Key Locations of Palaces, Roads, and Streams in Maps; Map Source: Hur (1994); Yang and Yi (1995); Gyeongseongbu (1914))

Fig.2. The Method of Mapping Major Administrative Buildings and Street Patterns (A: Integration Values for a Map with Straight Lines; B: Integration Values for a Map with Curved Lines; C: An Axial Map of the Daedong Yojido Map of 1861 with Straight Lines; D: An Axial Map of the Dosung Samkunmun Bungoejido Map of 1751 with Curved Lines; E: The 1914 Japanese Map of Hanseongbu; F: The Daedong Yojido Map of 1861; G: A Standardized Street Map Based on the 1914 Map)
Once standardized maps were obtained, the entire area of Seoul was subdivided into five administrative regions based on administrative boundaries: the central, northern, eastern, western, and southern parts. The spatial integration value for each region was calculated using the global integration method ($R = n$) based on the space syntax approach. The integration value measured the average cognitive complexity of approaching one region from another. For instance, if a street in a specific area was intersected by a number of secondary roads, the area was considered to present a high integration value because of its increased accessibility from other areas through a set of the shortest paths leading to it. This method was chosen because it could better predict an area's configurational relationship with the larger urban grid than the local-integration method (Hillier, 1996). After regional variations in street patterns were investigated, more fine-grained axial maps were drawn for the years 1751, 1861, and 1902 based on the space syntax approach.

In this study, two definitions—the top 5% and 20% integration values for the city's entire urban grids—were selected to highlight segments of streets with higher integration values over time. Fig. 3. shows highly integrated streets in red and less integrated (highly segregated) streets in blue.

Then each axial map was compared with the distribution pattern of major administrative buildings. In this study, 5 palaces, 11 royal villas, 15 government/military headquarters, and 11 economic authority buildings were plotted on the 1914 map. Although these did not constitute a complete map of major buildings that existed in Seoul, precise locations could be confirmed through marked buildings based on historic maps and documents (Fig. 4.). Some buildings not listed here were removed from the study because their locations were not sufficiently evident from the source material.

Fig. 3. The Space Syntax Analysis Procedure (A: The 1751 Map of Seoul (Dosung Samkunmun Bungoejido); B: The 1861 Map of Seoul (Daedong Yojido); C: The 1902 Map of Seoul (Hanseongbu Jido))

3. Results: Highly Integrated Streets Incrementally Spread Out from the Center Toward the Southwestern Part of the City

According to the analysis of space syntax, the central part showed the highest integration value (1.316) in 1751, followed by the western (1.217) and southern (1.061) parts. The eastern (0.946) and northern (0.943) areas were the least integrated ones. The prominence of the center was consistently found in the years 1861 (1.329) and 1902 (1.324) (Table 1.).

The results are not surprising in that the central area of Seoul served as an urban core of the capital from the very beginning of the dynasty. However, the moderately high integration value of the western and southern parts relative to the eastern and northern areas indicates that street development and neighborhood changes took place in these areas (Fig. 5.).

Fig. 4. Locations of Palaces, Royal Villas, and Administrative Buildings (A: Palaces and Royal Villas; B: Main Government Offices; C: Economic Authority Buildings; Source: Kwon and Kim (2004))
With areas showing the top 5% integration value visualized, the prominence of Jongro, a major commercial corridor with a centralized marketplace authorized by the royal government—was clearly illustrated. In the 1751 Seoul map, for instance, Jongro was the only highly integrated street crossing in the city in the east-west direction. In the 1861 map, Jongro’s hierarchical priority was further strengthened through its linear extension to the east of Hanseongbu (Fig.6.-a). This territorial expansion was associated with King Jungjo’s (1776~1800) political determination to develop the eastern area. The king forged his political connection to his predecessor by directing the construction of a ceremonial building as well as by relocating residents to the area by virtue of tax abatement and the development of the city’s basic infrastructure through public investment (Joseon Wangjo Silok, 1780; Fig.6.-b). Later, integrated streets started to spread out vertically from Jongro, as shown in the 1902 Seoul map. The expansion included a major administrative corridor of the dynasty to the south of Gyeongbokgung Palace; Deoksugung Palace and urban regeneration near the palace; and Namdaemunro, a commercial boulevard abutting markets located in the central area southwest of Seoul (Fig.6.-c).

With areas showing the top 20% integration value drawn, the western and southern parts of the city emerged as hot spots of the city’s intensive street expansion. Changes in these areas based on the 1861 and 1902 maps imply the substantial diversification of districts and infrastructure projects over time. This development included the establishment of Gyeonghuigung Palace and Deoksugung Palace, replacing small royal villas in the early seventeenth century, as well as the establishment of a sizable number of administrative offices. In addition, the Joseon government in later periods sought to battle colonial rule in the face of the increased Western and Japanese influence. One such effort was King Gojong’s (1863~1907) redevelopment of the capital, particularly the western part of Hanseongbu, as a way to legitimize his regime through modern urban functions (Joseon Wangjo Silok, 1895). Deoksugung Palace and its neighboring districts, for instance, were reshaped as an administrative town with military barracks and a training camp (Fig.6.-d).

Fig.5. Maps of the Distribution of Integration Values (A: Regional Boundaries Shown in the Map of 1770; B: The Distribution of Integration Values; C: An Axial Map of the Southern District; D: An Axial Map of the Eastern District; Map Source: Hur (1994))

Fig.6. The Distribution of Highly Integrated Streets in Hanseongbu (A: Streets with the Top 5% Integration Values in 1751, 1861, and 1902; B: The Transition of the Eastern District in the Dosung Samkummun Bungoejido Map of 1751 (Left) and the Daedong Yojido Map of 1861 (Right); C: The Transition of the Southwestern District in the Daedong Yojido Map of 1861 (Left) and the Hanseongbu Jido Map of 1902 (Right); D: Streets with the top 20% Integration Values in 1751, 1861, and 1902; Map Source: Hur (1994); Yang and Yi (1995))

In comparison to this southwestern area, changes in the eastern part were rather slow. In addition to the government’s political undertaking, marked differences in street integration between the eastern and western parts may be explained by geographic factors. The eastern part of Seoul was geographically a low-lying area. During the rainy season, the increased flow of surface water and the Cheonggyecheon stream frequently inundated the neighborhood. Therefore, the government’s public investment in the western area was less costly than what the development of disaster-prone areas of the eastern part would have been (Fig.7.).
A Novel Transition: The Spatial Integration of Commercial Areas and Government Districts

In the early Joseon Dynasty, the placement of the king's palaces and major administrative boulevards within the city wall was one of the major planning issues. The locational separation of administrative and commercial areas shown in the earlier spatial structure of Seoul may be explained by the ideological split between the lives of the aristocratic elite and commoners in pre-modern Joseon. The social exclusivity embedded in the hierarchically segregated regime may fit smoothly into the spatial dichotomy of rulers and the ruled, but according to the present GIS analysis, this disconnection between the two areas started to shift toward spatial interdependence at the beginning of the seventeenth century. In addition, a number of newly formed royal villas and government buildings were located in commercial areas (indicated in red in Fig.3.).

The city's spatial restructuring was likely a risky and costly political initiative for a regime that had just suffered two unprecedented wars: one with the Toyotomi Shogunate of Japan (1592-1598) and the other with the Qing Dynasty of China (1636-1637). Nonetheless, royal families and high-level bureaucrats carried out the relocation plan. The decision was spurred at least in part by a general consensus on shifting the national economic policy toward commercialization. This new policy changed Seoul's urban structure by relocating royal villas, economic authority buildings, and military headquarters. Those offices actively involved in commercial transactions with markets located in the central and southwestern parts of Seoul, whose integration values were higher (as indicated by the red color) than those for other parts of Seoul. The analysis results can be summarized as follows:

First, the dominance of Jongro and the associated street expansion in later years indicate that the spatial integration between the regime's administrative function and commercial neighborhoods was due in part to an axial shift in the dynasty's major palaces. Changdeokgung Palace and Gyeonghuigung Palace, for instance, started to replace the administrative role of Gyeongbokgung Palace, which was not reconstructed after the war. This change led to the reconfiguration of the city's administrative axis from Gyeongbokgung Palace/Changdeokgung Palace to Changdeokgung Palace/Gyeonghuigung Palace, and this axial shift further spurred the redistribution of high-level bureaucrats' offices and the relocation of royal villas. This integration is also illustrated by the new location of the government headquarters, where the prime minister made decisions on the nation's internal politics.
and foreign policies. Based on the maps, there were two government offices for the prime minister, and these offices were located between the main gates of the palaces and Jongro. The reconfigured site of the top administrative headquarters of the Joseon Dynasty, that is, the king's palaces and government headquarters, shows that the political arena closely approached commercial neighborhoods of Seoul and was located in the central and southwestern parts of Seoul, whose integration values were higher than those for other areas based on the GIS analysis (Fig.9.).

Second, coterminous with the rise of economic authorities, royal families and their relatives started to play more prominent economic roles. Beyond hosting political events and ceremonies in remote locations, royal families continued to expand their family-owned, tax-exempted lands in the late Joseon Dynasty through reclamation or confiscation. With increased income from land-based assets, several royal villas were given the authority to control informal trading in the market and aid poverty-stricken commoners by providing food and basic shelter. These new missions helped to accelerate the relocation of royal villas, which were concentrated mainly in the central and southwestern areas of Seoul near the street of Jongro, which showed high integration values at the start of the seventeenth century. The easy accessibility of these areas likely enhanced Jongro's prominence as a multifunctional spine of the city's urban network and reinforced the relocation of royal palaces and economic authority buildings. Newly established government offices dealing with national economic policies and tax collection as well as royal villas led to the territorial expansion of Jongro. In addition, economic authority buildings, endowment management offices, international trading offices, and diplomatic offices were relocated to areas near Jongro and Namdaemunro. These sites were chosen to locate the power base of royal families and bureaucrats in the vicinity of the nation's commercially vibrant neighborhoods (Bibyeonsa Deungnok, 1671; Joseon Wangjo Silok, 1617). Further, a newly established military authority for making and distributing war supplies helped to activate commercial activity in the late Joseon Dynasty and was also located with a market precinct in Jongro. This authority not only boosted the area's manufacturing sector, which included weapons, shields, and materials for defense, but also conveyed powerful social messages by carrying out capital punishment in public (Joseon Wangjo Silok, 1728). Locations of royal villas and government authority buildings coincided with those areas showing high integration values.

5. Discussion

The evolution of Seoul's urban structure during the study period was a notable deviation from the fundamental principle of urban design shared by many Asian countries. The principle of Qianchaohoushi (前朝後市) — locating administrative offices in front of the royal palace and forming a market in the backyard under the rubric of Zhouli Kaogongji (周禮考工記) — served as the spatial paradigm for urban planning in ancient China and was followed by the Joseon Dynasty. Although this principle per se was not always observed, as demonstrated by the difference between the Xian and Beijing models in China, it fundamentally led to some spatial stratification between governmental administration and commercial neighborhoods (Jeon, 2003; Fig.9.). In the Joseon Dynasty, despite the governing principle of Qianchaohoushi, the urban formation of Seoul did not squarely conform to the standard paradigm. For instance, the commercial corridor Jongro was located south of the palace, not in its backyard. Despite the deviation, however, the dichotomy of administration and commerce strongly characterized the city. But the results show that this division started to blur in the seventeenth century, leading to the more prominent spatial integration between the eighteenth and early twentieth centuries.

It is debatable whether the restructuring of Seoul was an outcome of royal families' political will or the natural reflection of the bottom-up demand of the rising middle class. One of the fundamental triggers was likely the burning of Gyeongbokgung Palace during
the Japanese invasion of Korea between 1592 and 1598. Another social factor might have been the loss of royal prestige associated with the king's defeat in the wars. The need for the wholesale redevelopment of the palace and its neighboring areas after Qing's invasion between 1636 and 1637, together with the weakened authority of the nation's top administrator, reinforced the spatial concentration of major administrative functions around the central and southwestern parts of Seoul. The martial regime's new placement as well as newly established economic offices envisioned Jongro as a new multifunctional street of Seoul. This change affected the major route along which local municipalities' tax endowment and commodities were delivered to the capital. Therefore, the economic prominence of Jongro and its neighboring areas was sharply elevated to the national level during the seventeenth century. This area received a high integration value. In this transition, the urban structure of Seoul in the seventeenth century changed from symbolic separation to a pragmatic urban structure.

In short, the dynasty's administrative headquarters became increasingly integrated with commercial neighborhoods, including Jongro and the southern part of Namdaemunro. This integration represented a major shift in the urban structure of Seoul from the fundamental segregation of administrative and commercial areas. According to later maps, the name of the capital (Seoul) was often rephrased as "chengshi (城市)", meaning a "walled market," perhaps partly reflecting the changed perception of the importance of commoners' place in the city (Kim et al., 2013). Reinforcing the political and managerial role of Seoul after the war would not have been successful without the cooperation of the nation's political and military elites and commercial networks. Therefore, urban spatial consolidation was probably one of the most practical choices that the regime made in accordance with the rise of modern entrepreneurship in the country. The central and southwestern parts of Seoul expanded afterward, and in the early twentieth century, Seoul's territory extended beyond the city wall near Yongsan. This important topic is left to future research (Fig.10.).

6. Conclusions

This paper investigates the spatial transition of major administrative functions in Seoul and their growing proximity to commercial neighborhoods. The results based on axial maps using the space syntax method show that the king's place of residence (e.g., Changdeokgung Palace and Gyeonghuigung Palace), royal villas, and economic and military headquarters became spatially correlated with highly integrated street patterns near Jongro and Namdaemunro. This strong spatial correlation indicates a reciprocal relationship between the city's administrative and commercial neighborhoods.

It is known that the urban structure of old cities in East Asia followed the traditional technique of separating government buildings from commercial areas. According to the GIS analysis, however, Seoul's urban structure from the seventeenth century shifted to unify these two important facilities of old Seoul, and here pragmatism and geographic merits might have propelled its economic-oriented government policy.

This rise of pragmatism during the late Joseon Dynasty was encoded into urban space, which shifted away from the ideological separation between administration and commerce. The results indicate that the influence of the Chinese classic principle of urban design might have been overrated, if not unrelated, with respect to the modern transition of East Asian cities pursuing a policy of economic development, as in the case of Seoul. Future research should examine the effects of old Seoul's pragmatism and urban structural transition on the urban space of modern Seoul.
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