Changes in the Silla Capital’s Road and Urban Structure

Hwang In-ho*

Introduction

Silla, whose origins can be traced back to the founding of the statelet of Saro in 57 BC, gradually expanded to become a powerful ancient state which effectively conquered the various statelets that made up the Jinhan Confederacy as well as Gaya. During the 7th century, it conquered Baekje and Goguryeo and removed Tang influence from the Korean peninsula to achieve the unification of the three kingdoms. Gyeongju, the capital of Silla for some 1,000 years until the collapse of the kingdom in 935, is located in a basin area. More to the point, it is surrounded by the Hyeongsan River’s main tributary, the Seocheon, as well as by secondary streams such as the Namcheon (Muncheon) and Dongcheon (Bukcheon). Meanwhile, the fortresses established in the mountains surrounding the Gyeongju basin, such as the Myeonghwal Fortress, Namsan sinseong, and Seohyeong Fortress, functioned as the outer walls of the city (naseong). Many other fortresses were also set up along the main roads on the outskirts of the capital city.

Wolseong, the royal palace and center of Silla’s capital city, was first constructed during the 22nd year of Pasanisageum (101). Much as was the case with the fortress of Geumseong (21st year of Bak Hyeokkeose) established during the initial stages of the foundation of Silla, Wolseong

* Jungwon National Research Institute of Cultural Heritage
Initially functioned as little more than the area in which Silla kings resided. Wolseong began to take on the basic trappings of a capital fortress during the late 5th century as its status as the kingdom’s political and military center was increasingly emphasized. It was also during this period, that post stations connecting the center and outlying regions were installed, administrative units were established, and local military-style governors were dispatched to strengthen the center’s control over the periphery. The construction of Wolseong during the 9th year of the Maripgan Soji (487) served as an opportunity to solidify internal unity at a time when the struggles between the three kingdoms had reached a new level, and also became a symbol of Silla’s full-fledged reorganization of its governing structure.

During the 6th century, Silla undertook institutional reforms that included the reorganization of the central bureaucracy and the promulgation of administrative laws (520), reforms which were taken as part of its wider efforts to establish a state governance structure. In addition, it also reestablished the ruling structure in local areas. Factors such as its wars of conquest and exchanges with the Liang (梁) and Chen (陳) dynasties of China proved to have a profound influence on Silla’s reorganization of its ruling structure and the advent of a centralized state. It was based on this political and social background that the construction of a Chinese-style capital fortress was implemented in order to actualize a monarch-centered bureaucratic state anchored in administrative laws. The model capital fortress as envisioned by the ancient states of East Asia was one that featured a structure in which public facilities and residential spaces were separately established within urban blocks rooted in standardized gridiron-type road networks. As such, this was a system which facilitated the government’s establishment of rigid control over the ruled class.

However, in the case of Silla, the inherent strength of the existing power group revolving around the political entities known as the yukbu (six political divisions) acted as an obstacle to efforts to construct a new palace or build a new capital city via the relocation of the existing capital. This particular power arrangement also greatly complicated attempts to
reorganize the capital city. Therefore, urban organization efforts were during the early stages limited to smaller core areas such as Wolseong. It was only during its heyday that Silla was finally able to develop the features of a capital city, a process which involved several gradual expansion plans.

As a result, the process through which the capital city of Silla was established exhibits marked differences from that of the capital cities of other surrounding kingdoms. This anomaly can be explained by the uniqueness of Silla society, a society which effectively managed to preserve a balance of power between the royal authority and aristocrats with vested interests for a prolonged period of time. The difficulty of maintaining such a balance is clearly evidenced by the inertia that has characterized the ongoing plans to construct the special administrative district called the Sejong Special Autonomous City which would function as a new administrative capital, a process that has been bogged down by political struggles and regime changes.

This study analyzes the gradual process through which Silla established Gyeongju as its capital city, a process which saw the abandonment of the traditional urban structure based on the yukbu (six political divisions) in favor of the new concepts of a capital fortress system (Doseongje) and an institutional mechanism known as the block and village-based administrative system (Bangri) designed to bring about a centralized state. This study also examines, based on the results of archeological excavations, the characteristics of Gyeongju during the mid-ancient era, or when the planned urbanization started to be implemented, and the gradual changes that occurred after urbanization.

**Current State of the Research**

Most of the research conducted on Silla’s capital prior to the 1990s, at which time little to no archeological materials were available, involved the use of methodologies rooted in the disciplines of philological history
and historical geography. Based on these methodologies, various means of restoring the capital city were suggested. However, the discovery of traces of systematically designed block and village (Bangri) units hinting at the presence of specific spatial planning on the outskirts of the Hwangnyong Temple site during the late 1980s had the effect of greatly altering the circumstances surrounding such studies.

The conduct of an investigation designed to identify the boundaries of Hwangnyong Temple also revealed the presence of large-sized urban remains in no way affiliated with the temple being surveyed, such as a residential area featuring roof-tiled houses surrounded by large fences spanning as much as in excess of 140 m and four-lane pebbled roads. As such, the investigation of the boundaries of Hwangnyong Temple produced the unexpected result of uncovering the actual features of Silla’s capital city, and simultaneously provided an opportunity to revive long-stagnating archeological studies on this particular topic. Thereafter, as a result of a long running project that involved the excavation of a block unit (about 26,600 m²) adjacent to the eastern boundary of Hwangnyong Temple, the possibility began to be advanced that a reorganization of the capital city, through such means as the reestablishment of the capital area based on a new capital fortress system (Doseongje), had in fact been begun by the time Hwangnyong Temple was constructed.¹

Recently, there have been an increasing amount of attempts to, based on the results of excavations of urban relics, highlight the link between the plans for the development of the capital city, as well as the changes in the urban structure, as being related to the internal changes that took place within Silla society after the mid-ancient era. However, the unique nature of Silla’s capital city and its complicated structure, as well as the limitations stemming from a lack of materials, has resulted in such studies which have attempted to empirically restore the planned urbanization of Silla’s capital city making little real progress. In addition, the conducting of studies on Silla’s capital city has been further complicated by the fact that there have been many instances in which newly produced archeological results and excavations have not been consistent with historical records
relating to this particular period.

In this regard, the records contained in the *Samguk sagi* (三國史記, History of the Three Kingdoms) which relate how the term Bangri (block and village) came to be employed in the capital city from the 12th year of Maripgan or King Jabi (469) onwards have drawn much attention from researchers interested in the period in which Silla’s capital city was reorganized. Here, various interpretations have been introduced. These have included the theory that these new administrative units were organized under the traditional administrative divisions called yukbu, or that the introduction of these new units effectively signaled a change in the characteristics of these yukbu, which had long been regarded as independent political entities, carried out in accordance with the overall reorganization of administrative units. One particularly interesting opinion which has emerged is that the ri (里, village) system was first implemented during the reign of King Jabi at a time when the basic framework of the bu (部, division) system remained in place. Under this interpretation, the granting of the title of ri to existing villages was not a mere renaming of units, but rather a part of the royal authority’s efforts to reorganize the village system so as to enhance central control over the internal affairs of each bu. The introduction of this ri system thus became one of the reasons for the changes which occurred with regards to the characteristics of the bu.2 Meanwhile, the bang (坊, block) system, which was implemented in order to address the need to setup a new village unit amidst an every growing population, is believed to have been in place by the early Unified Silla era. The generic name bangri is estimated to have been recorded by ensuing generations.

As no archeological materials which could prove that urban planning was carried out in Gyeongju during the 5th century have to date been uncovered, the conclusion has been reached that the establishment of the ri or bangri system which occurred during the reign of King Jabi did not come about as part of a structuralized effort to reorganize the administrative system amidst a wider campaign for urban development within the capital city.
In the *Japji* 3, Geography 1 section of the *Samguk sagi* it is stated that the capital city was 3,075 foot steps long and 3,018 foot steps wide, and that the city consisted of 35 *ri* and 6 *bu*. In addition, other records can be found which state that during its heyday, the capital of Silla consisted of 178,936 households, 1,360 *bang*, 55 *ri*, and 35 gilded mansions (*Samguk yusa* (三國遺事, Legends and History of the Three Kingdoms of Ancient Korea), I Wonder, Jinhan), or that there were 360 *bang* and 170,000 households (*Samguk yusa*, VIII Seclusion, Yeombuls). In terms of the markets called *sijeon* (licensed shops), records indicate that while the *Dongsi* (eastern market) was first installed in the capital area during the 10th year of the Maripgan Jijeung (509), the *Seosi* (western market) and *Namsi* (southern markets) were put in place during the 4th year of King Hyoso (695) (*Samguk sagi*, *Silla bongi* 4).

The above-mentioned records show that Silla established *ri* (35 or 55 *ri*) and *bang* (360 or 1,360 *bang*) under the six *bu*, and that three markets were operated. Moreover, during its heyday, in excess of 170,000 people resided in the capital area, which also featured 35 gilded mansions. In this regard, the *bang* and *ri* system has been regarded as an important tool with which to shed some light on the organized establishment of the capital city begun during the mid-ancient era as part of a wider reorganization designed to bring about a centralized government, a process which was completed during the Unified Silla period. In addition, unlike the *bangri* installed during the reign of King Jabi, the *bangri* system in place during the zenith of Silla power was established based on a more practical concept of administrative units that saw the existing residential areas centering on the six *bu* be completely reorganized under the guise of urban planning. The archeological results which provide partial confirmation of such assumptions will be introduced in the next part of this study. Notwithstanding this fact, certain issues still need to be resolved before the veil can be fully lifted on the planned urbanization process that took place within the capital city. These include the gap in the number of *bang* and *ri* which were recorded, the question of whether a subjugate relationship existed between the *bang* and *ri*, and that of whether the
lowest administrative unit identified as a result of excavations was in fact what was referred to as bang.

The origins of the term bangri (坊里, Bangli in Chinese) can be traced back to the Western Zhou (西周) dynasty of China. In that particular instance, the notion was introduced as part of the planning for the royal palace, shrine, city and village, and roads regarded in such texts as the Jiangren (匠人, Artisans) section of the Kaogongji (考工記, The Artificers' Record) as representing the basic elements of the capital system. References to li (里, village) and luli (閭里, community), both of which indicated the basic unit of organization within a city’s residential areas, can be found in epigraphs established during the Zhou era. While the royal palace of Zhou was the first to begin to refer to the li as bang, the <Weiseo (魏書, Book of Wei)> states the Northern Wei city of Pengcheong also began to refer to the li as bang. In addition, it also became common practice amongst the denizens of the Northern Wei city of Loyang to refer to units that featured many households as bang.

Records found in the Xiangdafu (鄉大夫, The Senior Official in the Village) section of the <Zhouli (周禮, Rites of the Zhou)> indicate that the state obliged the people to stand guard over the gate of their li or luli whenever a national calamity emerged. Thus, we can surmise from such records that the li were surrounded by fences that effectively resulted in the gate being the only means of entrance or exit.

Within Northern Wei’s city of Pengcheong and Helian Xia’s Tongman Fortress, a bangjiang (坊墻, district fence) system that revolved around the building of walls or fences around villages or communities as a means to incorporate conquered peoples and ensure their effective control, as well as to increase overall productivity, was put in place. The type of capital fortress that first began to appear during the Sixteen Kingdoms of the Five Barbarian Peoples (ohosipnyuguk), and whose structure was further expanded upon by the Northern dynasties until it was completed with the emergence of the capital city of the Tang dynasty Chang’an, featured elements which could not be found in the type of capital traditionally found in ancient China. One of these differences was the
emergence of this bangjang (坊墻, district fence) system designed to control conquered peoples. In this regard, some scholars have surmised that this bangjang system represents the most important indicator in terms of the capital cities of dynasties founded by nomadic tribes.\(^5\)

The capital of Silla also boasted a structure similar to the bang that was used to surround individual residential units with fences (bangjang). Such a structure in all likelihood was used to facilitate the task of controlling and managing residents. However, as the gilded mansions adjacent to the outer fences had their own individual gates that opened up toward the road, the conclusion can be reached that the control function of the Silla’s bangjang system was not as rigid.

It is a fact that Silla’s construction of grid-pattern road networks and implementation of residential divisions were based on the Kaogongji section of the <Zhouli> in which traditional urban plans in East Asia were laid out. However, rather than completely accepting the Chinese system, Silla adjusted this Chinese-style capital system to meet its own needs and implemented its own form of urban development. For starters, the structure and size of its bang and ri differed from those found in the capital cities of its neighbors.

The Road and Urban Plans Put in Place within the Capital of Silla

Unlike the arterial roads linking the center to local provinces and the small roads within the smallest residential block unit known as the bang, the capital roads (wanggyeong doro) were roads which were used to effectively partition the inside of the capital city into square or rectangular-shaped blocks, with a certain axis and width maintained within each grid pattern. As these capital roads also featured side trench covers (cheukgu), or subterranean drainage canals in the center of the road, we can see that they functioned not only as logistics and transportation networks, but also as drainage systems.

The road networks were basically constructed in accordance with the
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South-north central axis of Wolseong that served as the basic reference line for the urban plans. In this regard, the south-north axis of the capital road was consistent with what was regarded as the true north at the time, which was 8° east of the modern magnetic north. The capital roads were built out of a mixture of pebbles and mud, and then covered with decomposed granite soil. Although these roads were repaired on average 2-3 times, and some more than 5 times, the width of the road remained unchanged. The differences in the width of the roads excavated from various locations appear to be related to the status of the surrounding buildings and the volume of logistics.

While embankments were the main type of drainage ditch employed, vertical and subterranean drainage systems have also been discovered on one side, both sides, or in the center of the road. Excavations have revealed that when a trench cover (cheukgu) was installed on one side of the road, the road surface tended to lean toward the trench in order to facilitate drainage. In the case of the large-scale capital road uncovered as part of the relics found in the eastern part of the Hwangnyong Temple site (S1E1), stones used to demarcate lanes that played much the same role as traffic lanes do today have been found. In this regard, thick pebbles were found to have been laid out on the central lane of the road, and wheel marks were also discovered on the surface of the road. On the other hand, the sidewalks established on both sides of the road were covered with small pebbles and sand designed to increase the comfort of those who used them.

Both the wastewater emanating from residential areas and rain water were disposed of through the drainages installed along the road. The system was set up in such a way that all the drainages, which were organically connected to each other like a web, emptied into the rivers and streams. However, one also finds many records of floods that caused great damage to a large number of people. In this regard, it is believed that the limited ability of the drainages installed along the roads to deal with such significant amounts of water at a time spurred the government to forge the large-scale drainage way consisting of an artificial stream that
passed through the eastern part of the Hwangnyong Temple site and ran in a south-north direction.

The plans for the capital road system were intricately related to those associated with the development of the *bang* and *ri*. The grid-pattern road network can in fact be regarded as a cluster of ‘井’-type roads that surrounded residential blocks (households). The rectangular or square-shaped blocks partitioned by such roads generally served as residential areas. However, national facilities such as secondary palaces, ponds, markets, government offices, and temples were also built within one or various numbers of such blocks. As such, each block was fundamentally partitioned by roads, and independent spaces were created by installing fences outside of each block.

The full features of such blocks were first revealed in the eastern part of the Hwangnyong Temple site. However, subsequent excavations in various areas of the capital have revealed that no unified structure or size existed for such administrative units. Although slight regional and temporal differences have been uncovered, there is general agreement that this block unit was the smallest administrative unit within the capital of Silla. In this regard, this unit is believed to correspond to the ‘*bang*’ element of the *bang* and *ri* identified in historical documents. However, Silla’s 360 *bangs* (or 1,360 *bangs* depending on which records one uses) exhibit major differences from the *jobang* (條坊, road and district units) used in Xian, China and Nara, Japan in terms of the scale of the residential unit. Simply stated, the *bang* found in China and Japan can be regarded to correspond to 35 (or 55) ‘*ri*’ in Silla. Nonetheless, it has yet to be clearly identified whether the ‘*ri*’ in Silla was in fact a larger unit than ‘*bang*,’ and if so, how many *bangs* were part of each ‘*ri*’. Although these differences in terms of the administrative unit systems employed leave some room for confusion, this study defines ‘*bang*,’ a block unit whose length spanned a maximum of 163 m on each side, as the smallest administrative unit employed within the capital city of Silla.

The fence surrounding a *bang*, which was called a *bangjang*, was not built separately from the fences which were used to partition the
residential areas within the *bang*, but rather was combined with the fences of individual houses located on the edges of the *bang*. During this period, the *bangjang* was directly contacted to the roads or the trench covers (*cheukgu*) of the main road. The *bangjang* consisted of 1 m wide river stones packed on top of one another, with clay used to fill the cracks in between. While the majority of *bangjang* remains uncovered to date consists of two or three layers, no traces of any such fences have yet to be found amongst the relics excavated from the 696-2, Dongcheon-dong site. There is a strong likelihood that the fences in this area were completely destroyed, and that these structures made of a mixture of soil and stone were thereafter replaced by wooden or bush fences. However, the possibility also exists that a conscious decision may have been made from the outset to not install fences in this area fences. To this end, there may have been sites or buildings where the presence of unique characteristics may have rendered the construction of *bangjang* unnecessary. Such cases may have included large-scale facilities such as the Hwangnyong Temple built on four *bangs*, as well as production and distribution complexes.

Roads and *bangjang* have been regarded as valuable remnants (*yugu*) which highlight the conformity of the spatial partitions within the capital city. Viewed in this light, these can also be perceived as important elements through which to foster a better awareness of the urban planning that took place in conjunction with the development of the capital city of Silla. Although the width of such structures has varied from 5 m to more than 20 m, the remnants of roads which have to date been discovered in Gyeongju can in general be broken down into three categories, namely, large, medium, and small roads. In this regard, the possibility has been raised that Silla adopted a method that involved using large-sized roads to partition the city as a whole before forging the small-sized crossroads that effectively created the smaller block unit subdivisions. However, the use of such a spatial partition method would require the large-sized roads and crossroads to be repetitively arranged in a certain manner. To this end, the actual partitions have been revealed to be more complicated.

The author of the current study concluded in another research that the
initial design of the roadbeds did not take into consideration the width of roads, but rather employed a uniform subdivision method. Here, these roadbeds can be understood to be the spaces between the bangjangs. Nevertheless, conditions such as location, volume of traffic, and continuity with arterial roads meant that various widths of roads had to be constructed, which in turn implied that the entire roadbed could not be used. S1E1, which is located in the eastern side of the Hwangnyong Temple site, is adjacent to S0E1 in the north. An east-west road serves as a border between the two areas. The roadbed of this particular road between these two bangs is consistently 21 m wide. However, when the small-sized 5.5-7.5 m wide road (which was as wide as 9.2 m in some parts) was actually built, a long-belt shaped empty space appeared.

As such, the roadbeds featured a unified width, and this regardless of the size or width of the road to be built. These roadbeds consisted of standardized partition units that effectively encompassed the roads and the inner units demarcated by the bangjang. While this uniform subdivision method is regarded to be a spatial partition method unique to Silla, it can to some extent be compared with the jobang (條坊, road and district units) system found in the Chinese cities of Changan and Pengcheong. However, further studies on this topic are required.

Changes in the Urban Structure of the Capital City of Silla

Silla first started to lay the groundwork for the development of a highly advanced urban structure similar to that found in the planned cities of today in its capital city of Gyeongju some 1,500 years ago. In this regard, Silla’s contemporaries Goguryeo and Baekje each relocated their capitals on two occasions, moves which came as part of efforts to expand their territories, or to seek out ways to escape the pressure being applied by foreign powers and bring about the revival of their fortunes. Conversely, Silla never relocated its capital, but rather gradually implemented an urban development plan that revolved around the Wolseong. By absorbing
and integrating the existing six-\textit{bu} system into an administrative structure that was based in the capital city, Silla was able to bring about centralization. To this end, Silla can be said to have faced many difficulties and limitations that other states which opted to simply construct new cities did not have to face. For starters, it needed to consider the continuity with the facilities which had already been established prior the mid-ancient era. Above all however, the greatest difficulty which Silla faced with regards to the implementing of an innovative reorganization of its capital city was a ruling structure that was based on a six-\textit{bu} system that was in turn rooted in the interest driven relations established between the various aristocratic groups.

In order to mitigate internal conflicts and implement centralized politics based on the rule of law, ancient Japan also established a Chinese-style capital fortress. The construction of Fujiwara Palace began during the reign of Emperor Temmu who grasped power during the Jinshin Rebellion. The project was completed in 694, or some 10 years after it was begun. Although it only served as the capital for 16 years before the capital was once again relocated to Heijo Palace in Nara, Fujiwara Palace proved to be instrumental in Japan’s establishment of a state structure based on the rule of law, for it was there that the Taiho Code (701), political framework, and reform of the economic structure through the minting of the \textit{Wado Kaichin} coins (和同开珎) (708), was completed. The Fujiwara Palace shared many structural similarities with the capital of Silla Gyeongju, including the absence of outer fortresses and an inability to fully move beyond its original location in the Asuka basin.

As part of the nine provinces and five secondary capitals (9 \textit{ju} 5 sogyeong) system established following the unification of the three kingdoms, Silla developed a plan relocate the capital to Dalgubeol (modern-day Daegu) in 689 (9th year of King Sinmun). However, this plan failed to come to fruition due to the objections of aristocrats. There was also a plan to construct a new royal palace in the marshland in the (north) eastern part of Wolseong in 553 (14th year of King Jinheung). However, the restrictions imposed by the aristocrats and perceived waste of national
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strength which such an endeavor entailed, resulted in the plan being abandoned in favor of one that involved the construction of Hwangnyong Temple. Although the majority of the relics uncovered in Gyeongju are from the Unified Silla period, there are certain materials, such as the relics located at 556, Inwang-dong, which can be traced back to the period in which Hwangnyong Temple was constructed. Although not on the same scale as the construction involved in the case of the relocation of a capital city, it has been surmised in some quarters that a significant urban development plan was undertaken as part of the wider reorganization of the state system during the period in which Hwangnyong Temple was established. Moreover, this urban development project is believed to have been closely related to the plan to construct a new palace (Buddhist temple) which was initiated during the reign of King Jinheung.

In this regard, special attention should be paid to the opinion that marked similarities exist in terms of the size, type and location of the Geumdang (Golden Hall) site where the Hwangnyong Temple was constructed and that of the Taiji Hall of Fujiwara-kyo and the Kondo (Golden Hall) of the Taegwan daesa (Great Official Temple); and that the construction of these palace-type temples with golden halls reflected the Buddhist notion of the “King as Buddha (天子卽如來)” through which politics and religion were to be combined.

Establishment of a Capital City during the Mid-ancient Era

<Diagrams 1-4> exhibit the measurements of the main attributes believed to reflect the relevant spatial partitions of the main royal capital relics excavated in Gyeongju to date such as the distance between roads and bangjiang and the width of each structures. While <Diagram 1> shows the eastern side of the Hwangnyong Temple site, <Diagram 2> is concerned with the central part of the capital city located near Wolseong. The names and measured distances of the various units (bang or block) were calculated in a unified manner using the excavation coordinates of
the Hwangnyong Temple site as the standard.\textsuperscript{10}

As can be seen in <Diagram 1>, the roads excavated over the last sixteen years along the outskirts of S1E1 vary in width from a minimum of 5.5 m to a maximum of 15.5 m. The roadbeds (distance between the bangjiangs) on which Roads ① and ③ were constructed were all found to be 21.3 m or 60 dongwicheok wide (1 wicheok equals 0.355 m wicheok was a unit that was also employed by Goguryeo). Therefore, although the roadbeds were all of identical size, various-sized roads were actually installed. As such, while the method of equally partitioning roadbeds, or so-called uniform subdivision method, greatly simplified the process of building roads, it also produced unnecessary surplus spaces whenever a narrow road like Road ③ was built.

Compared to the square-type block unit that is S2E1, S1E1 exhibits a more rectangular shape that narrows as one moves eastwards. This apparent anomaly is believed to be the result of the special order which called for the establishment of a large-scale drainage system that while beginning from the southeast corner of Hwangnyong Temple, gradually moved northwards. Initially, this drainage system consisted of a small natural stream which flowed from south to north. Sometime thereafter, an artificial stone-made stream was constructed. It is interesting to note that this particular block was reduced by some 60 wicheok, which is roughly the same size as the standard width of the roadbeds. This implies that this 60 wicheok unit was in fact a popular partition unit.

As can be seen in <Diagram 1>, the central axis of Road ② was moved 2.9-3.7 m to the west (6 m when based on the external fence of Hwangnyong Temple), thereby breaking the originally planned roadbed. This particular incongruity was the result of the fact that the early layout of Hwangnyong Temple did not fully cover four blocks (bang). In other words, the south-north road had to initially be slightly moved westwards from its intended location in order to make it adjacent to the outer fence of Hwangnyong Temple. However, excavations of the final layout of the temple show that some parts of this south-north road were destroyed to make room for the temple’s external fence. Thus, while the initial
intention was to ensure that the temple did not overlap with the road, this was in fact the eventual end result.

<Diagram 1> First Stage of Urban Planning (Around the Hwangnyong Temple Site)

Next, the values of the main coordinates of S0W5 (relics found at 556, Inwang-dong) and S6W3 (relics found within the Gyeongju National Museum site), and S1W2 (temple ruin site west of Hwangnyong Temple) were compared with the coordinates of the eastern part of Hwangnyong Temple site in order to verify whether the roadbeds were also 60 wicheok wide, and simultaneously calculate the width and length of individual block units (refer to <Diagram 2>).
First, with regard to the width and length of individual block units, the distance between the corner of the fence located in the northwestern part of S0W5 (Inwang-dong coordinates: N165 W835 m) and the corner of the northwestern part of S2E1 (S2E1 coordinates: S172.7 E141.7-142.5 m) was found to be 976.7-977.5 m from east to west and 337.7 m from north-south. From an east-west direction, six roadbeds and block units were found to exist between these two points. Using the standard 60 wicheok width for the roadbeds, each of these block units laid out from east to west were found to average 141.5-141.6 m in width, or approximately 400 dongwicheok (142 m).

In addition, the total distance from east to west between the crossroad (Gyeongju National Museum coordinates: S980 W345 m) discovered at S6W3 and the Inwang-dong coordinates three blocks to the west was estimated as approximately 490 m. Between these two points, three sets
of roadbeds and block units have been located. Using the standard 60 wicheok width for the roadbeds, the block units laid out from east to west were found to average 142 m (400 wicheok) in width. To this end, a comparison of the museum coordinates with those of S2E1 yielded identical results.

Let us now analyze the length of the individual unit blocks, or the distance from south-north. The total distance between south and north, or from the museum coordinates to those of S2E1, was revealed to be 807.3 m. Using the museum coordinate S980 as the central east-west axis, we can see that five block units and 4.5 roadbeds existed between the above-mentioned two points. Using the method introduced above, we find that the average length from south to north of each block unit ranged from 142.4-142.9 m. Much as was the case with the width of block units, we can see that the length of each block unit was also uniformly partitioned in swathes of 400 wicheok (142 m).

However, certain areas that do not conform with 400 wicheok as the standard length for block units have also been uncovered. Two blocks separate the Inwang-dong coordinates from those of S2E1. Using the above-mentioned calculation method, our analysis found that the length of each block unit was from south to north in fact 5 m longer than 400 wicheok (142 m). This anomaly is believed to be the result of the fact that the Inwang-dong coordinates are located in an area into which the Hwangnyong Temple situated along its northern border was extended. In other words, the north-south road running between the Hwangnyong Temple and S1E1 located east of the temple was slightly moved westwards to accommodate the framework of Hwangnyong Temple.

The above-mentioned analysis of the urban relics located in the central area of Silla’s capital revealed that the minimum block unit was determined based on equally partitioned roadbeds of 60 dongwicheok (21.3 m) and not the roads themselves. This block unit, which can be considered to be the bang found in historical documents, was composed of a square-shaped structure of some 400 wicheok (142 m) in both width and length. However, certain relics have been found that would seem to
indicate that large-scale facilities were on occasion constructed in a manner that would ensure that they could be connected to artificial streams or other national facilities.

That being the case, was the spatial partition method based on 460 wicheok (163.3 m) discovered at Wolseong and Hwangnyong Temple applied to the overall area of Gyeongju? Here, the conclusion can be reached that this was in fact not the case. The relics of Bunhwang Temple, the Jeollangji (believed to have been the site of the northern palace), and in the Seobu-dong area rendered in <Diagram 3> show that these structures did not fully mesh with the early urban planning framework employed to the central area of the capital. As such, it is believed that the extension of the capital city was based on a partially transformed urban plan.

<Diagram 3> Second Stage of Urban Planning

Only the northern and western borders of the bang-type units with an area of 460 wicheok developed during the first stage of urban planning has been uncovered. While the northern border of this area is the east-west roadbed adjacent to the northern part of Hwangnyong Temple, the
western border is the south-north roadbed adjacent to the area west of S0W5. Here, the western border is included in the line occupied by the projected main south-north road (*Jujak daero*) which linked Wolseong and the northern palace. Although no large-sized road has to date been discovered, the south-north central axis of Wolseong was in fact used as the standard axis during the urban development within the capital city.

Meanwhile, the discovery of a large-scale 23 m wide road known as the ‘*wanggyeong daero*’ as part of the relics found at the Gyeongju National Museum has led some scholars to doubt the existence of the *Jujak daero*. Regardless of this debate, there is little doubt that this road (Road 3 in <Diagram 2>) must have served as an important arterial road. Although the exact width of this road remains unknown because the *bangjang* on both sides have yet to be discovered, it is nevertheless regarded as a road which featured a 60 wicheok (21.3 m) roadbed.

Although the first stage of urban development was carried out centering on Wolseong, the urban areas composed of *bang*-type units were actually discovered in the northeast of area Wolseong where Hwangnyong Temple was located. As the western part of Wolseong included royal tombs such as the *Daereungwon*, the Gyerim Forest, and government office complexes, it can be surmised that only limited development was carried out in this area. Therefore, the conclusion can be reached that the first stage of urban planning was designed to combine these two areas to create a long rectangular shaped area that resulted in making it look like Wolseong was in the southern part of this new central space.

Wolseong represented the core element of the first stage of this urban development plan. In this regard, while this tradition was continued up until the final stage of this urban plan, separate core facilities around which the urban designing revolved can be identified during each stage. Hwangnyong Temple was a Buddhist temple which, because of its status as a temple involved in the defense of the nation, featured architecture that was as grandiose as that of the royal palace. It had a large-scale public square in front of the South Gate (*nammun*). In addition, it was a large-scale temple that occupied four block units (*bang*). As the construction
of Hwangnyong Temple was closely related to the planned royal capital, there is a strong likelihood that the temple was identified as a core area during the first stage of urban development.

Meanwhile, some scholars have advanced the theory that the planned royal capital was established based on an independent plan established after the construction of Hwangnyong Temple, and that the area occupied by Hwangnyong Temple never figured into the equation. In this regard, the organic relationship that existed during this early stage between Hwangnyong Temple and the urban relics found in the surrounding area has already been discussed at length in a previous study.

If we accept the fact that the plan for the construction of Hwangnyong Temple (which was in reality initially a plan for a new palace) was carried out as a part of the wider reorganization of the ruling structure based on the rule of law, a transformation that involved a negotiated process between the royal authority and aristocratic power, we can therefore surmise that urban planning in the capital area was during the early stages implemented in a small scale manner that was limited to the Wolseong and Hwangnyong Temple area.

Furthermore, the relics and remains excavated from the area developed during the first stage of urban development, such as short-legged tall glasses, concave roof tiles, and roof tiles made from a manufacturing framework (mogol) found at 556, Inwang-dong, were consistent with the period in which Hwangnyong Temple was constructed.

Expansion and Reorganization of Unified Silla’s Capital City

The planned urbanization of Silla’s capital city was characterized by the fact that these efforts began from the central area and gradually moved towards the outskirts of Gyeongju, and that different spatial partition methods were carried out during each stage. In addition, although several structural transformations occurred during the three rounds of expansion which were carried out, the main goal of urbanization remained that of organically connecting the entire capital city.
The areas seen in <Diagram 3> were developed during the second stage of urban planning. These include the east-west road located in the southern part of Bunhwang Temple, the north-south road situated in the western part of the Jeollangji in Seongdong-dong, which is believed to have served as the northern palace, and the crossroad found amongst the relics discovered at 19, Seobu-dong.

First, the northwestern corner of the crossroad found amongst the relics in Seobu-dong (Seobu-dong coordinates: N1252 W2232 m) and the eastern end of the north-south road located in the western part of the Jeollangji (W964.1 m) sit some 1,268 m away from each other. It has been surmised that 9 roadbeds and 8 blocks existed between these two points. A 40 wicheok (14.2 m)-sized road was constructed at the crossroads found amongst the relics at Seobu-dong. To date, no remains of any road bigger than this 40 wicheok (14.2 m) road have been discovered within the area in which the second stage of urban development took place. Using 40 rather than 60 wicheok as the standard size of roadbeds, a new calculation method based on 40 wicheok roadbeds and block units of 400 wicheok was produced which features an error range of 4.1 m.

Next, the distance between the Seobu-dong coordinates and those of east-west road located in the southern part of Bunhwang Temple (south end: N298 m) was estimated to be 954 m. Therefore, the conclusion can be reached that there were between these two points, which were separated by 6 blocks, 7 roadbeds and 6 block units. The use of the above-mentioned calculation method revealed that each block unit was some 400 wicheok in length, and the margin for error was an insignificant 2.6 m. Therefore, the only major change which occurred in terms of the spatial partition method during this second stage of urban planning was that the size of the roadbed was reduced from 60 wicheok to 40 wicheok; meanwhile, the size and type of block unit employed during the first stage remained unchanged.
As can be seen in <Diagram 4>, the excavation carried out in the Bukmun-ro and Dongcheon-dong areas located on the outskirts of Gyeongju revealed the presence of a new spatial partition method completely different from that employed during the second stage of urban planning. Significant changes were in fact wrought in terms of urban planning during the final stage of the expansion of the capital city. In this regard, not only was the size of the roadbed changed, but so was that of the block unit. To begin with, the shape of block unit was changed from a square to a rectangle. In addition, vestiges of changes made to road partitions because of the influence of streams and other geographical elements have also been uncovered.

A total of five wanggyeong doro (capital roads) spanning some three block units were discovered between the relic sites at 681-1, Dongcheon-dong and at 690-3, Dongcheon-dong. To this end, while the distance between the roads running from north to south was found to be 160 m, while the distance between the roads running from east to west was revealed to be 125 m. Each road, with the notable exception of those areas
where the original form was partially transformed, were 6.5 m wide and featured roadbeds that spanned some 20 wicheok (7.1 m). Based on this fact, the basic spatial partition unit employed in the Dongcheon-dong area was identified as the following: roadbeds of 20 wicheok (7.1 m), and block units that were 430 wicheok (152.65 m) wide and 330 wicheok (117.15 m) long.

As can be seen in <Diagram 5>, the urban relics from the Unified Silla period that have been uncovered to date include the crossroad which was discovered amongst the relics excavated from 696-2, Dongcheon-dong in 2006-2007. The southwestern corner of this crossroad (Dongcheon-dong coordinates 2) is about 330 m to the west of the standard Dongcheon-dong coordinates 1. 

Although a 10 m error can be found between these two points located two blocks apart from an east-west standpoint, the conclusion has been reached that these relics were in fact based on the partition method employed during the third stage of urban planning, which was based on a basic block unit that spanned 450 wicheok (159.75 m) from east to west and 350 wicheok (124.25 m) from south north.

<Diagram 5> Urban Planning in the 696-2, Dongcheon-dong (東川洞) Area
The spatial partition method employed in the Dongcheon-dong area also appears to have been present in conjunction with the relics uncovered in the Bukmun-ro area south of Bukcheon. As such, we can deduce that the area between the Bukmun-ro and the relics in Seobu-dong located one block below to the south was the border between the second and third stages of urban planning.

As such, the construction of this planned city, which began in the center of the royal capital, was not carried out in a uniform manner. Rather, the urban plan which was utilized as part of efforts to extend and reorganize the capital city, a task which was undertaken on at least two occasions, involved the modification and supplementation of the method employed during the previous stage of such urban planning.

While the size of the roadbed was decreased from 60 to 40 wicheok during the second stage of urban planning, the scale of such roadbeds was reduced to 20 wicheok during the third stage of this process; in addition, significant modifications were also made to the basic block unit. The reduction of the roadbed undertaken during this stage is believed to have been motivated by a desire to minimize the unnecessary surplus spaces which emerged when the actual width of the road was smaller than that of the assigned roadbed.

Furthermore, the spatial partition methods employed during particular stages of the urban planning process were not applied to the relevant areas in a uniform manner. Rather, existing partition methods were intertwined with newly formed ones as part of efforts to organically link existing road networks to newer ones.

For example, in the Bunhwang Temple area developed as part of the second stage of the urban planning process, the new 440 wicheok-based partition method was not employed in conjunction with the building of the relevant east-west and north-south roads. Meanwhile, the 460 wicheok-based partition method was employed in conjunction with the partitioning of the spaces and building of the road network in the southern part of the Hwangnyong Temple area; in this regard, if the new 440 wicheok-based method had been applied in a uniform manner, the south-
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north roads that connected the Bunhwang Temple and Hwangnyong Temple areas could not have been smoothly connected to one another. To this end, while the south-north roads were built in accordance with the existing 60 wicheok-sized roads, the 40 icheok method was employed when building the new east-west roads which were not connected to the existing roadways.

Similar characteristics also emerged throughout the areas in which the third stage of urban planning was carried out. However, in areas where the presence of a stream acted as a natural barrier that resulted in making the need for linkages relatively less necessary, as was the case with the Dongcheon-dong area north of Bukcheon Stream, the planners were more free to adjust the size of roadbeds to the partition method employed. Furthermore, it does not appear that the changes wrought to the size of the basic block unit posed any major problems for the planners.

Various transformed structures emerged on the outskirts of the capital developed as part of the third stage of the urban planning process. To this end, the lattice-shaped blocks can be identified as the most representative example of such transformed structures which emerged during this period. In this regard, some scholars have concluded that much like the buildings established during the 8th century located 20 eastwards of the magnetic north found amongst the relics uncovered in the eastern part of Bunhwang Temple, the influence of geographical constraints such as Sogeumgang Mountain and Bukcheon Stream might have forced planners to establish their blocks somewhat to the east of what the existing partition method called for. Materials which support this opinion have been steadily uncovered. Some examples include the remnants of a 6 m wide road running from north to west and south to east found amongst the relics at the 891-10, Dongcheon-dong site excavated in 2007; and the road and building site which were unearthed amongst the relics found at 412, Inwang-dong.

Vestiges of lattice spatial partitions have been discovered in the areas in which the third stage of urban planning was commenced after the 8th century; to this end, such partitions can be regarded as having been
designed to maximize the use of land amidst the geographic conditions present. The decrease in the size of the blocks where those of lower status resided and minimization of the unnecessary roadbed space that became increasingly commonplace as the urbanization process was gradually extended to include the outskirts of the royal capital also appear to have been motivated by this fact.

Conclusion

Based on the capital road (wanggyeong doro) structure widely regarded as being the most reflective amongst the urban relics excavated to date in Gyeongju of Silla’s spatial partition system, this study analyzed the characteristics of Silla’s reorganization of its capital city and the process through which the urban structure was transformed as part of the urbanization plans. As part of its efforts to actualize politics in accordance with the rule of law, Silla started to reorganize the capital city based on the new concept of the bangri system, a process which began with the construction of Hwangnyong Temple. Grid-pattern road networks were established, and standardized block (bang)-type districts were newly formed within city spaces. However, this system essentially designed to control and manage the ruled class faced many difficulties, most of which stemmed from the limitations imposed by the aristocratic class.

In this regards, the construction of a planned city was carried out in a gradual manner rather than all at once throughout the entire city. The early stage of this process saw urban development be carried out on a limited scale in the Hwangnyong Temple area.

Hwangnyong Temple was organically related to the framework of the first stage of urban planning. Given various aspects such as its location and size, it can be surmised that Hwangnyong Temple represented the core facility around which the urban design process revolved during the early stage.

In the aftermath of the unification of the three kingdoms, the capital
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The city was expanded and reorganized on at least two occasions. Such efforts to increase the scale of the capital city were motivated by factors such as the increases in the population occasioned by the growing number of subjugated kingdoms, and the natural development of the state. The first expansion of the city was focused on the northern palace (Jeollangji in Seongdong-dong). At this juncture, the conclusion can be reached that such an expansion was not motivated by a drop in the status of Wolseong, or the fact that the latter had lost its functionality, but rather as having been designed to expose the upgraded dignity and status of Wolseong both domestically and internationally by adopting a model of capital city similar to that found in other unified kingdoms.

Lastly, after the 8th century widely regarded as the heyday of Silla, reduced-scale urban areas began to expand toward the outskirts of the capital city. Simultaneously, transformed spatial partitions created in accordance with geographical conditions were in some instances employed as part of efforts to heighten land use. The small-scale residential areas and production complexes which were established on the outskirts of the capital city featured characteristics that differed from those of central area of Silla’s capital city.

Keywords: bangrije (坊里制), roadbed, uniform subdivision method, block-type unit

Notes:
3 The Jiangren (匠人, Artisans) section of the Kaogongji (考工記, The Artificers'
Record), which were government documents compiled by the Qi (齊) dynasty during the late Spring and Autumn Period, dealing with the construction of roads describe the urban plans put in place during early Western Zhou, plans that subsequently became perceived in Ancient China as the basic structure for the traditional capital system, in a detailed manner.


7 Nine partitions in the front, 4 partitions on the side (55.3 x 30.4 m), external building 9 rooms x 4 rooms, internal building 7 rooms x 2 rooms

8 Yang Jeong-seok, 2000, “Silla’s Hwangnyong Temple, Northern Wei’s Yongning Temple, and Japan’s Daikandai Temple - With a Special Focus on the Capital System of East Asian Kingdoms during the 5-7th Centuries (Silla hwangnyongsa, bukwì yeongnyeongsa geurigo ilbon taegwandaesa - 5-7 segi dongasìa doseongjìewa gwallyeòn hayeo)”, *Hanguksa hakpo*, vol. 9; 2008, “The Capital City of Silla and Japan’s Fujiwara-kyō (Silla wanggyeonggwì ilbon deungwôngygeong)”, *Comparative Analysis of the Capitals of Silla and Other East Asian Countries - With a Special Focus on Fujiwara-kyō’s Acceptance of a New Capital System (Dongasìa doseonggwa sillǎ wanggyeonggui bigyo yeongu - ilbon deungwôngygeongui sindoseongje suyongeul jungsìmuro)*, Collection of Essays Presented as Part of the Academic Conference Conducted during the Silla Culture Festival (Silla munhwaje haksuk nonmunjìp), vol. 29, pp. 74-77.

9 Hwang In-ho, 2006, Diagram 1-4.

10 The excavation site is located some 23.5 km away from the seated Buddha in the center of the Cheongeumdong to the south. In this regard, the south-north central axis of the layout of Hwangnyong Temple passes through this excavation site.
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14 These measurements were obtained using aero-photographs, satellite photographs, and digital maps. The possibility cannot be ruled out that slight differences may in fact exist where the distances are concerned.

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신라 왕경 도로와 도시구조의 변천 연구

황인호(국립중원문화재연구소)

본고에서는 경주에서 발굴된 도시유적 가운데 공간분할체계를 가장 잘 반영하는 왕경 도로를 중심으로 계획도시화에 따른 왕경 개편 양상 및 도시구조의 변천과정을 살펴보았다. 신라는 율령정치를 실현하기 위하여 황룡사(皇龍寺) 창건단계부터 새로운 개념의 방리제(坊里制)를 적용하여 실질적인 수도정비를 시작하였다.

이때 바둑판 형태의 도로망을 설치하고 규격화된 방격가구(方格街區)를 새롭게 편성하였는데, 이것은 피지배층을 엄격하게 통제하고 관리할 수 있는 시스템이었기 때문에, 귀족세력의 견제 등 많은 어려움이 따랐던 것으로 보인다. 따라서 계획도시의 건설은 일시에 왕경 전역에 걸쳐 이루어지지 못하고 단계별로 점진적으로 이루어졌다.

초창기에는 왕성(王城)인 월성(月城)을 남쪽 중앙에 두고 서쪽의 능묘(陵墓)지구와 대칭되는 황룡사 주변 지역에 대한 소규모 도시정비가 이루어졌다. 황룡사는 1단계 도시계획의 틀과 유기적이며, 그 위치나 규모 등 여러 가지 측면에서 볼 때 초기 도시계획의 거점시설 역할을 했던 것으로 보인다.

삼국통일 이후에는 국가의 발전과 더불어 복속된 국가로부터의 인구 유입이 늘어나는 등 왕경 확장의 필요성에 따라 최소 2차례의 확대 개편이 이루어졌다. 먼저 별궁(別宮)이었던 북궁(北宮, 城東洞 殿廊址)을 중심으로 계획도시가 확대되었다. 이때 월성의 위상이 축소되거나 기능을 상실했다기보다는, 당시 유행하던 통일제국들의 도성모델을 새롭게 채택하여 한층 격상된 위엄을 대내외적으로 표출하고자 했던 것으로 생각된다.

최종적으로 전성기를 이루었던 8세기 이후에는 외곽지역까지 규모가 축소된 시가지를 확장하는 동시에, 부분적으로 토지의 활용도를 높이기 위해 지형
조건에 맞춘 변형된 공간분할이 실시되었다. 이곳에는 주로 소형 주거지나 소규모 생산단지가 배치되었기 때문에 왕경 중심부와는 여러 가지 측면에서 다른 양상이 확인된다.

주제어: 방리제(坊里制), 도로부지(道路敷地), 균등분할방식, 방격가구（方格街區）