

The city as an interface of scales: Gangnam urbanism

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In his essay for the catalogue of the Contemporary Korean Architecture exhibition at the Deutsches Architekturmuseum in 2007, Sung Hong Kim remarked that “the first challenge imposed upon Korean architects is to integrate architectural and urban morphologies within the context of hyper-density”¹. Of course, higher urban densities are being continuously promoted everywhere in the Republic of Korea to accommodate for population growth, which is particularly accelerated in Seoul. One aspect of the relationship between architecture and urbanism, evident to those tracking the dynamic coming of age of contemporary Korean architecture in the last ten years, is the great variety of building scales at which it is developed. The 2007 exhibition included the ‘Missing Matrix’ apartment building (designed by MASS Studies) in Seocho-Dong, an International High Rise Award winner, with gross floor area of 54860 m², built on a site of 4284 m² to a footprint of 1713 m² and a height of 100 m. Office towers within 1 km of distance exhibit even higher volumes and floor to site-area ratios, as for example the Kyobo Tower (designed by Mario Botta), with 92717 m² built on a site of 6770 m² to a height of 117 m, or the Gangnam Finance Center (design by Kevin Roche and John Dinkeloo), with 212379 m² built on a site of 13156 m² to a height of 206 m. Readers of the Space Magazine, however, are aware of extraordinary architectural skill displayed by Korean architects working at much smaller scales. For example, two Gangnam neighborhood facilities designed by Dongjin Kim are 1535 and 989 m², built on sites of 486 and 318 m² to footprints of 280 and 155 m² respectively. At a slightly larger scale, the Won & Won office and commercial building by Doojin Hwang, also in Gangnam, is 4527 m² on a site of 572 m² and with a footprint of 342 m². Such variety of scales is of interest for several reasons. First, it documents a vibrant architectural culture made possible by opportunities offered to larger and smaller architectural practices. Pluralism facilitates innovation and experimentation. Second, it implies a range of investment and investor sizes, a robust middle class asserting itself in proximity to the imprints of larger corporations. In this sense, what we witness in Korea is a distributed process of positive side effects in a mixed economy, where success at one scale of economic activity supports success at another. Third, it often occurs within an urban morphology with particular structural characteristics. In this essay, we respond to Kim’s observation by focusing on urban morphology, taking Gangnam as a case-study which holds lessons for urban designers and planners everywhere.

The urban morphology of Gangnam largely results from Land Readjustment policies that promoted urbanization in the 1970s². Land Readjustment projects cover just under 40% of the urbanized area of Seoul and thus set the tone for metropolitan urbanism. A study of Gangnam, which is the largest redevelopment area to result from Land Readjustment in South Korea, illuminates broader trends. Superblocks are formed by a network of wide and linear arterial streets, with smaller blocks inside, as in Figure 1a. In the particular example shown, arterials are spaced at roughly 830 m intervals and their widths range between 20 – 35 m; the mean area of the superblocks defined by the arterials is about 70

¹ Kim S H, 2007, "Megacity network", in *Megacity Network - Contemporary Korean Architecture* Eds S H Kim, P C Schmal (Jovis Verlag, Berlin) pp 43-59

² Kim S H, 2013, "Changes in urban planning policies and urban morphologies in Seoul, 1960s to 2000s" *Architectural Research* **15** 133-141

ha. Internal blocks differ in size; their mean area is 5100 m². Plots are between 250-300 m², close to the prevailing sizes in Seoul in general. High rise buildings and high development densities tend to be located along the perimeter with medium or low rise buildings and development densities in the interior. Internal streets are 6-12 m wide, with alleys as narrow as 4 m. We can make a clear distinction between internal main streets and secondary access streets, not merely according to street width, length and connectivity but also according to alignment; main streets have low sinuosity as they cross the superblock. The overall density of streets is 0.32 km/ha. Taken together, streets cover 24% of the total surface.

The syntactic structure of the superblocks is made explicit in Figure 1b, where all segments of the street center line map are colored to reflect their degree of centrality along a spectrum from red (high) to blue (low). The measure of distance used to calculate centrality is the number of direction changes required to get from one part of the street network to all other parts. This measure reflects the cognitive effort entailed in movement, as distinct from the physical effort which is associated with path length. Central streets are more likely to be used by those walking around the superblock and more likely to feature on their cognitive maps of the environment. In Gangnam, syntactically central streets include the arterials but also some main streets internal to the superblocks. Thus, the street network facilitates movement from the perimeter to the interior of the superblock and exploration of the otherwise irregular and quasi-organic urban fabric. In doing so it knits together movement to and through different scales of development, helping to integrate them into a coherent urban locality. The pluralism of architectural scales noted in the opening paragraph is organized by the spatial syntax of the superblock.

This particular kind of urbanism, Gangnam urbanism, has merits of wider relevance. It allows the creation of local areas with distinct character, while enabling large scale metropolitan connectivity, by public transportation or privately used vehicles. It creates a variety of urban conditions in close proximity, thus setting the stage for a mixture of land uses or development densities and a pluralism of urban actors. In this regard, Gangnam stands in contrast to the urbanism of enclaves, where local areas are strongly separated from global arterials and isolated from one another, thus setting the stage for patterns of social and functional segregation. It even stands in contrast to attempts to deliberately plan for a differentiation of scales within the discipline of regular street grids, such as the urban sectors proposed and implemented by Doxiadis³ - a planner whose legacy commands attention because he linked urban design to network infrastructures and to a coherent interdisciplinary theoretical framework for the planning of cities to serve man not only as parent and worker, but as learner and artist and citizen. While Doxiadis strove to order particular relationships between land uses, street types and block types, Gangnam seems to invite evolution over time; while Doxiadis sought to clearly demarcate the transitions from more local to less local scales of organization, Gangnam dares us to enmesh scales within a continuous and continuously differentiated fabric. In many respects, Gangnam can thus be seen as a contemporary and partially planned version of the organically grown city, the city that absorbs towns and villages within a metropolitan fabric. London, as analyzed by Hillier⁴, stands as the paradigmatic example. With the important difference that the social, economic and cultural dynamics that have produced Gangnam and have, in turn, been reinforced by Gangnam, have operated within the span of less than half a century. The relationship between the morphology of urban form and such dynamics will hopefully be elucidated by others, who have the relevant authority and expertise. Here, we would like to explore two abstract questions: what are the principles at stake and how flexibly they can be adjusted to different parametric requirements.

³ Doxiadis C A, 1968 *Ekistics: an introduction to the science of human settlements* (Oxford University Press, New York)

⁴ Hillier B, 1996 *Space is the machine* (Cambridge University Press, Cambridge)

Figure 2 shows five hypothetical street networks, all generated on an underlying 5 x 5 regular orthogonal grid. In figure 2.1 all streets have the same length, connectivity and degree of syntactic centrality based on the number of direction changes required to get from one place to any other. As street segments are removed from this underlying network, the resulting networks can be seen to vary on a scale from 'homogeneous' through 'differentiated' to 'polarized'. In polarized networks, such as those in figures 2.4 and 2.5, there is a sharp distinction between short streets that do not make any connections other than access to the properties attached to them, and the long streets that make connections to many other streets thus contributing to network connectivity as a whole. In differentiated networks we see a variety of conditions as streets of varying connectivity combine to form local portions of the street network, within the framework of global connections. The critical philosophical point embedded in the diagram can be summed up in three observations: First, in *polarized* networks the 'local' is reduced to insignificant small segments of the overall system, isolated from one another and discontinuous in scale and experience from the global city structure. Second, in *differentiated* networks, locality emerges as a characteristic deformation and differentiation of the overall network, without sharp discontinuity. Third, in *homogeneous* networks locality cannot be defined according to the properties of the street system and any differentiation of one place from another has to depend entirely on architecture. The city of connected and differentiated localities, with the variety of conditions that it offers, can best support open social processes and cultural creativity, including the architectural creativity documented in the Korean Pavilion of the 2016 Venice Biennale.

The question of whether the Gangnam model can be sustained or generalized over time is fundamentally linked to social and economic dynamics. It also has some parametric morphological dimensions that we briefly examine in Figure 3. We show automatically generated superblock urban layouts, where the deformation and differentiation of the internal street network arises from three moves: first the independent definition of the range of acceptable dimensions of perimeter blocks; second, the placement of an internal facility whose rotation determines the rotation of the two traversing main streets; third the placement of street grids of given rotation and dimensions in each of the resulting trapezoid quadrants. In all cases main internal streets are 16 m and other streets 12 m wide. Figures 3a and 3b show parametrically generated layouts where most blocks have the average size of present Gangnam blocks (a bit less than 0.5 ha). Figures 3c and 3d show layouts with larger block sizes (more than 0.8 ha on average), many similar to the blocks of Chicago or New York. Figures 3e and 3f show layouts with a mixture of internal block sizes, some similar to those found in the historic cores of French towns such as Aix-en-Provence or Carpentras, and others similar to the blocks in Lisbon's Baixa district, while perimeter blocks are kept to the sizes typical in US downtowns. As shown in figures 3g – 3l, the syntactic structure of centrality is similar to that of Gangnam in all cases. Of course, different designers or theorists will 'read' and 'reconstruct' the syntactic structure of Gangnam in different ways. In addition, there are not many publications in English that help us understand the historic origins of the Gangnam layouts, whether these were influenced by geographical conditions, by prior property demarcations, top-down planning, or the effects of regulatory frameworks. As such publications become available, so our readings of Gangnam will become more insightful. Our diagrammatic reconstruction, however, indicates that the structural principles, whatever their historic origins, can be flexibly adjusted to critical urban design parameters.

About 25% of the buildings included in the 2016 Venice Biennale Korean Pavilion are located in Gangnam. What does architecture contribute to the morphology of urban connection, diversity and scale? Much of the thinking that animates the Floor Area Ratio game, as illustrated in the Space magazine over recent years, is linked to the creation of spaces at the edge of the building that are visually connected to the street and interact with it. For example, in the case of the Gangnam neighborhood buildings designed by Jeongim Kim of *Seoro Architects* or by Dongjin Kim this has to do not only with balconies and terraces but also with exposed stairs, entrance recesses and circulation

passages. In the case of the ZWKM housing block, designed by Young Joon Kim of *yo2 Architects*, stairs, access balconies and passages extend the system of alleys on the ground floor, taking advantage of the willingness of the client to have several properties developed through an integral design. The visual and geometric interaction of building circulation and urban fabric becomes a hallmark of contemporary Seoul architecture of a small and medium scale. However, the conception of the perimeter as part-building and part-urban space extends beyond the literal. For example, *Place J*, by Seunghoy Kim, also in Gangnam, cuts away parts of the implied volume in order to reveal an intermediate zone, architecturally expressed as a section into the building interior – the volume is defined by limestone louvers, while the surfaces revealed through subtraction are covered by stainless steel sheets. A similar process of cutting away a more opaque outer volume in order to reveal a transparent inner zone, given over to urban experience, also characterizes some of the work of Dongjin Kim. These few examples, and the work now exhibited in the Korean Pavilion, suggest that much of the energy embedded in contemporary Korean architecture is invested at the *interface* between buildings and urban space. Interface is of course celebrated at a larger scale by *Missing Matrix*, near Gangnam, and by other important residential building elsewhere, including, of course, the residence L-GA by Yongnam Kim of the Samhyun group.

The modernism invested in making interfaces in dense and continuously built environments is the counterpoint of the modernism of free standing sculptural forms, as well as the modernism of spectacular interiors concealed rather than revealed by the outer envelope. In addressing the city and the citizen, the contemporary Korean architecture of interface interprets context in terms of interaction. Thus, it intrinsically creates opportunities for free exchange and gregariousness that are essential to a democratic ethos. Such ethos, expressed in architecture, is powerfully founded in the syntactic structure of the urban fabric, as discussed above, and comes to characterize living in the inner city. Understanding this Korean integration of architecture and urbanism more deeply will be exciting and inspiring to all those who see in architecture the continuous investment of civilization in defining and animating public space, in ensuring that public space is continuously re-affirmed as lived-space. By 'lived space' we refer to the space of human face and social encounter, the space where economy and citizenship are still indissoluble. At a time when so much of our technological culture superficially appears to be about overcoming space, walking in Gangnam reminds us that dense and connected urbanism plus the web is a very different and much more creative proposition than enclave urbanism plus the web. The architecture of density that emerges in Gangnam is an affirmation, above all else, that in a vibrant society the maximization of gross floor area is not a sufficient aim. Cities support economies in many ways, including the presentation, in tangible form, of the social values that make economy possible. This is the lesson we can draw from the way in which Gangnam interfaces scales of spatial organization so that the urbanism of density is also an urbanism of pluralism and openness.

Captions:

Figure 1: Gangnam superblocs.

1a: Urban layout. 1b: Street network interpreted according to syntactic centrality values.

Figure 2: Hypothetical street grids arranged on a spectrum from homogeneous, through differentiated, to polarized.

Figure 3: Hypothetical superblock designs sharing the spatial structure of Gangnam superblocs but encompassing a variety of block sizes. 3a: Compact blocks approximating the average area of Gangnam blocks. 3b: Elongated blocks approximating the average area of Gangnam blocks. 3c: Compact blocks approximating the size of Chicago blocks. 3d: Elongated blocks approximating the size of Manhattan

blocks. 3e: Blocks approximating the size of blocks in the historic centers of European towns, 30° rotation. 3f: Blocks approximating the size of blocks in the historic centers of European towns, 15° rotation. 3g-3l: Street networks interpreted according to syntactic centrality values.