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**How can morphology contribute to urban management –
A case of Daegu city, South Korea**

Emilien Gohaud¹, Sanghyun Lee², Prof. Thorsten Schuetze¹

¹ S.A.I.D. Lab, Department of Architecture, Faculty of Engineering, Sungkyunkwan University, Republic of Korea

² Department of Urban Design, Daegu Metropolitan City, Republic of Korea

Abstract

Up until recently, South Korean cities have been managed to serve and foster the economic growth of the country. Cities like Daegu grew following a form of liberal 'laissez-faire' accommodating the dominant car-focused ideology and the speculative large-scale construction market. Little debate was conducted on the different options and qualities of urban form. The role of the government was to facilitate private development rather than to input a specific direction to urban and architectural projects. The result is a form of 'generic city' with limited coherence in its urban fabric and poor preservation of its historical value.

Recently, the local government turned to a more proactive role in the management of urban space, following the notion of cultural city. Urban morphology analysis is being introduced into the leading plan of Daegu city's Urban Design Department. But what can be the input of morphology in such an adverse context, where urban form and history have long been neglected, functionalist zoning is still the main urban planning tool, and car traffic the major determinant in planning? Using a typomorphological approach, the study aims to articulate city scales and develop policies and projects sensitive to the existing urban form. The results are discussed to establish the potential for urban form study to participate in the urban planning practice of public agencies in today's South Korea.

Keyword: urban design, urban planning, urban morphology, public agencies, South Korea

Introduction

In the second half of the 20th century, the Republic of Korea (hereafter Korea) transformed from an agrarian country into one of the world's most urbanized countries. Modernist planning concepts were imported from Japan and the US to support fast-paced urbanization in a country with limited urban culture (Jung, 2013). The authoritarian government of the 60s to 80s established a tradition of top-down development, where large-scale construction companies worked together with the state following a developmentalist doctrine. Until today, the implementation of urban projects is still heavily reliant on private actors to design and fund infrastructures (Kim, 2013). Moreover, windfall profits from extensive development established a culture of real estate speculation and corruption at the roots of regular public scandals. Shaped by a culture of laissez-faire, many Korean cities bear a resemblance with the so-called 'generic city' (Koolhaas et al., 1998). While the concern for cultural cities and liveability is rising along with the maturation of the society and the stalling of development, the change of urban paradigm in Korea faces strong resistance from established practices (Seo and Joo, 2019). Local urban planning services are trying to take back the hand on design but still tend to be limited to the role of facilitator of private business.

Seizing the opportunity of the redaction of a new 'Urban Design Basic Plan', the officer in charge (and co-author of this paper) attempted to introduce urban form study into the urban planning practice of the city of Daegu. During the investigation, public officials, who are accustomed to quick and concrete results, repeatedly questioned the practical use of such research. In response, the present paper attempts to identify concrete and realistic applications to urban morphology for today's Korean planning culture. Furthermore, this study supports urban morphology applications in international planning cultures, particularly in countries facing similar adverse conditions. The paper first establishes a background of existing links between urban morphology and planning, then discuss the current urban morphology practices in Asia and Korea. Next, researches undertaken for the Urban Design Basic Plan of Daegu and the limitation for translating them into practice are described. Finally, a set of concrete links from study to project is proposed and discussed.

Urban morphology and practice

Practical applications are a recurrent research topic in the field of urban morphology. In 60s Italy, typological research by architect S. Muratori and his follower had a clear intention to inform and justify design and translated into architectural and urban projects. At the same time in England, geographer M.R.G. Conzen developed a more purely academic approach to urban morphology. His successors devised practical applications for this history-geographic research with the notion of 'townscape management': a set of guidelines for the city's evolution based on its historical development (Moudon, 1994). In 80s France, architects such as Panerai and Castex used typo-morphology to legitimate their urban doctrine and propose alternatives to modern urbanism. Seminal urban form research also led to a shift in Paris urban code (APUR, 1998). New technics such as Spacematrix and Space Syntax introduced computative quantification of urban space used to generate and assess scenarios, regardless of the city's age or form. However, the historical western city remains the principal object for implementation (Whitehand, 2012). The idea that past urban form should inform, or even inspire future projects is at the heart of the traditional urban morphology approach. Thus, applications inevitably turn toward preserving or emulating existing urban forms (Oliveira, 2016: 151 - 163).

Expanding morphology to Asia

East-Asian countries have only recently been the focus of studies that showed the differences in urban contexts, cultures, and available research materials, highlighting the need to adapt Western-centric study processes (Whitehand and Gu, 2007). Following demographics booms and sudden urbanization, urban morphology's proposition that urban continuity is desirable to foster a necessary sense of rootedness is challenged (Koolhaas et al., 1998: 1248). In Korea, the work of Gelezeau (2003) seems to suggest that the population is doing reasonably fine in the 'republic of apartments' severed from every physical cultural roots. Could the need for urban continuity be a cultural bias? Chen and Twaites (2017) recently proposed a comprehensive application of the typo-morphological approach in Nanjing, China. The outcome is a set of

design guidelines in the English tradition, emphasizing the notions of type at the building and street network levels. While this approach is convincing for the historical part of Nanjing, propositions for the considerable contemporary urban extensions are limited.

The Korean situation

The historical city is but a small fraction of the Korean urban realm. For example, despite its long history, Daegu presents only 11% of its urban area dated before the 70s, and this 'old' urban fabric was significantly altered from its original form. Yet, most urban morphology studies in Korea tackle historical areas, stopping at the colonial period of the early 20th century (Kim, 2012). Indeed, recent fabrics issued from land readjustment and large housing complexes are harder to address with traditional urban morphology tools (Levy, 1999).

Korean urban morphology is little developed in practice and academia. No architecture or planning school in the Daegu region explicitly teaches urban morphology, making for the limited awareness of local practitioners. An urban analysis is conducted as a pre-design exercise in the studios but can remain a routine with little impact on design. The authors referenced 15 papers on Daegu urban form in the Korean Citation Index since 2000, of which 11 focused on the historical centre. A few recent publications studied Daegu in the frame of urban regeneration policies (Street Culture Citizenship Coalition, 2007, Kwon et al., 2014, Kwon et al., 2012). While those researches relate to urban morphology, they tend to focus on historical anecdotes and urban 'content', in the tradition of Korean Folk Studies.

Methodology

This study draws on the body of knowledge developed on urban morphology application. It first analyses the research conducted in the frame of the ongoing Urban Design Basic Plan of Daegu. Hinders to an urban form approach to planning in Korea are then identified through literature and practical experience. Examples of concrete applications that can address the current limitations are then proposed as empirical exploration. The examples follow a transverse three-scale approach on macro- meso- micro- levels as discussed by Levy (2005: 43) to illustrate the link between analysis, policy and project. The focus is on the street networks and public spaces, which shape the structure of the city and are controlled by the public power.

Results and Discussions

The new Urban Design Basic Plan

The redaction of the Daegu Urban Design Basic Plan is a two-year project ending in December 2021. The project work follows a three-step process, labelled 'DNA of Daegu', 'Way of Daegu' and 'Action of Daegu' (figure 1). The analysis was inspired by the works of Moudon (1986), Busquet (2005), Farrell (2010) and Chen and Thwaites (2017). However, the work did not follow a specific academic research process and mixed approaches freely. During the midterm assessment, the documentation work was praised, but the policy and

project outcomes were considered too limited and not clearly related to the analysis. Moreover, the research work seemed out of the scope of a city hall officer's duty, primarily as the department mainly focusses on public space management. Therefore, the officer in charge of the plan was pressed to focus on concrete application to his research.



Figure 1. Work process flow for the development of the new Urban Design Basic Plan of Daegu.

Limits to the urban form approach in Korea

Concrete applications of urban morphology in Korea requires understanding local limitations. The population poorly acknowledges the notion of urban space itself. Until 2004, long working hours and six workdays per week left not much leisure time to most of the working population. Therefore, the city was experienced primarily as a functional system, providing services rather than a beautiful and potentially pleasant space. The focus on private assets rather than common urban space translates into very strong land property rights. Therefore it is difficult to impose new guidelines on private property that might limit the development potential for the owners (Choi, 2002). Moreover, the established dominance of the automobile in public space limits the margin of action (Seo, 2000). Public urban planning officers themselves have limited awareness of urban form, and act as the executants of a generic centralized functional zoning system. Independent departments manage each field of urban planning (design, landscape, regeneration, traffic, etc.) without any central coordination. The cities' basic urban plans are often abstruse and hardly translated into facts (Kang and Kim, 2017). In fine, the culture of city planning departments is a culture of punctual projects rather than long-term visions. In such an adverse context, it could be argued that systemic changes are a prerequisite to any urban form study input. Yet, such changes are dependent on a long-term transformation of the urban culture. Making the most of the existing situation and produce even modest but easily understandable results can act as a reinforcement mechanism to foster such cultural changes. The authors attempted to devise propositions that could reconcile the urban form approach with the actual limitations.

Transverse approach

The following proposal intends to explore direct applications of urban form analysis into planning. The exploration is based on a multi-scale 'transverse' approach, aiming to demonstrate the link between urban form analysis and planning.

Macroscale

At the macro scale of the city, a distinct mesh of large avenues of four lanes or more can be identified (Figure 2). Korean contemporary cities are characterized by highly hierarchical street networks prescribed by law (Road structure rules Art.3). This road structure results from the desire to produce modern, car-focused cities, based on integrating Clarence Perry's neighbourhood unit concept into the planning process. The

neighbourhood unit concept evolved in Korea to become the ubiquitous superblock of contemporary cities (Jung, 2013). The contemporary Korean street structure effectively facilitates high average metropolitan level car traffic speed (34km/h measured by Daegu city in 2018). However, the system strongly limits citywide walkability as each superblock is isolated by wide main roads, having minimal permeability and crossings for non-motorized means of mobility.

Different street networks that could alleviate the car dominance and facilitate soft mobility in Daegu are present at the urban agglomeration level. The Sincheon and Geumho riverbanks constitute large open spaces that already accommodate bike- and walkways. Other remains of waterways, some presently covered by roads, were identified during the street morphogenetic study. Such paths could be rehabilitated and extend the soft mobility network. The railway that cuts the city on an East-West axis could accommodate a new bicycle road on its shoulder, creating a central crossroad for soft mobility at the city's heart. Amid the mesh of avenues, a pseudo-circular ring road of approximately 8km diameter can be identified. The ring road could be developed as a green boulevard, with integrated bike- and walkways, as its path crosses most of the peri-central green spaces of the city. This green road could be linked to the natural green areas in the outskirts of the city and act as a first layer of urban green space surrounding a city-centre poor in green spaces. A network of small streets presenting continuity throughout the city can be identified on the inside of the superblocks. By differentiating its urban design and facilitating the passage on the arterial roads, they could restore the connection between the different city parts and enhance walkability.

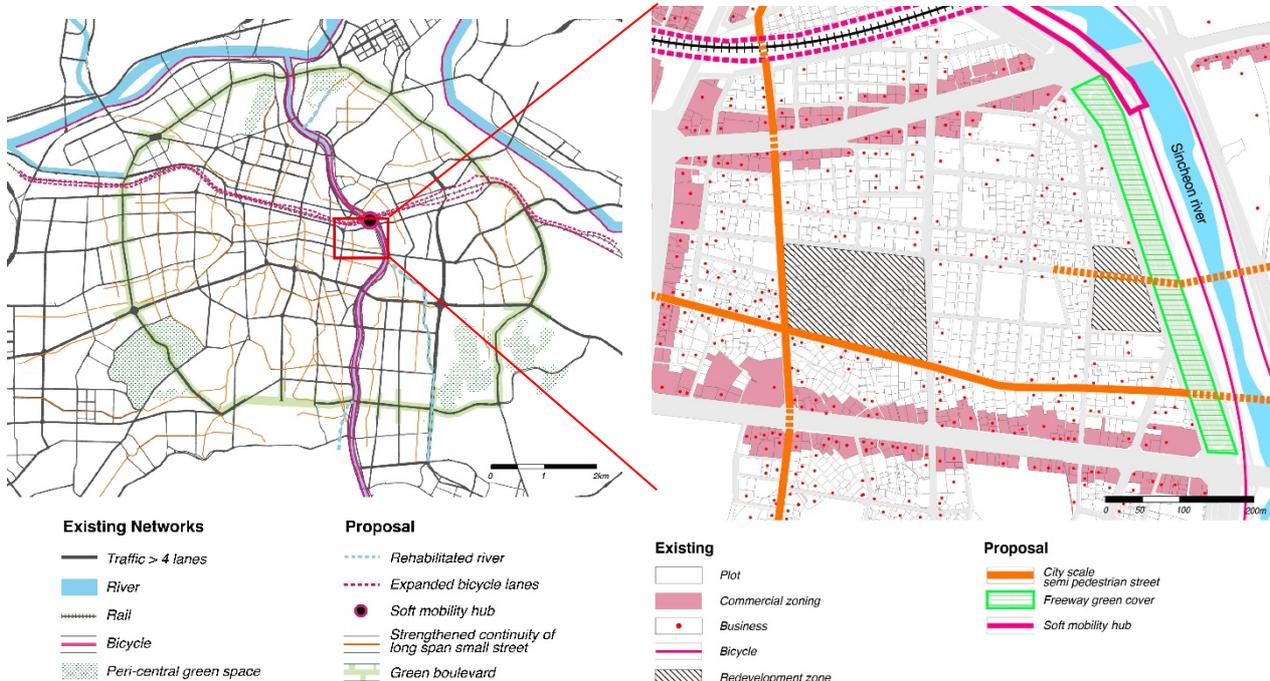


Figure 2. Daegu agglomerated area map. Macro-level network analysis and subsequent proposals.

Figure 3. Dongin-dong district map. Meso level public space analysis and subsequent proposals.

Mesoscale

At the mesoscale of the Dongin-dong neighbourhood, a clear superblock of approximately 400 X 700 m is identified (figure 3). The block is bordered on three sides by arterial roads, which sides are zoned as commercial and host a few large buildings. On the east side, the superblock is isolated from the Sincheon River by the Sincheon urban motorway. The concentration of commerce on the block outskirts is problematic as it drains out public life from the heart of the neighbourhood and locates it on narrow sidewalks along wide roads with high noise and exhaust gas emission levels. This arrangement contradicts the neighbourhood unit concept, aimed at gathering public life inside a neighbourhood. The study identifies two secondary streets that cross the superblock in the cardinal direction and continue through the city. The 2,6km East-West alley links the Sincheon rivers to the Western Seomun market. The alley consists of the Joseon-era Gyeongsang Gamyong street and its Colonial-era extension and could be connected to the river's east bank through a new footbridge. Most long-span alleys still existing throughout the city are pre-modern times path and streams. In contrast, superblock planning had few concerns for matching streets on both sides of the arterial roads.

A large central area of Dongin-dong went under redevelopment in 2021. An isolated high-rise complex will be constructed in an otherwise low-rise urban fabric. Such developments illustrate the current lack of concern for tissue coherence in urban planning. The development can also be regarded as an opportunity for revitalization as it will input a new population inside the superblock and foster shop development along the selected pedestrian axis.

The Dongin-dong area presents a unique opportunity to reconnect the city with the Sincheon river. The adjacent freeway portion consists of a trench that could easily be covered, extending the riverbank to the foot of the residential fabric. The planned housing development along the riverbank could include a financial contribution clause. At the northeast side of the area is the intersection of the river with the railway, identified at the macro level as a central point for Daegu's soft mobility network. The crossroad is materialized by a railway bridge doubled with a car bridge. Korean strollers appreciate spaces under bridges as rest spaces sheltered from both rain and direct sunlight. Design improvement of those spaces and the introduction of soft mobility related equipment can be part of both the waterfront regeneration vision and the diversification of mobility modes at the city level.

Microscale

The micro-level as proposed in this research focuses on the specific detailed configuration of the public space. It seems unclear if this level of detail pertains to the field of urban morphology. Only a few morphology studies address the detailed configuration of the street space (for example Allain (2004: 141-156)). In the case of Korea, it can be argued that public space design on arterial streets has a lifetime at least as long as the surrounding buildings. Moving a curb crystallizes tensions between the different users and might take longer than rebuilding all neighbouring buildings. Public space design greatly influences the practicability and

liveability of urban space, and the development of a dedicated morphological approach should be considered.

In the example of the Dongjin junction (figure 4), the dominance of exclusive car space (77.5%) in the overall public space is evident. Moreover, sidewalks are clustered with urban infrastructure and private advertisement banners. While a substantial reduction of car dominance in public space seems out of reach in the present social climate, the authors propose to assess and improve the performance of public space use. The detailed plan study reveals many oversized and underused spaces that could be put to profit for pedestrian comfort and green space without excessively restraining car traffic. From a detailed perspective, the urban furniture and material can be assimilated to the equivalent of style and ornament for building, and be the subject of a typological study. The actual design of pavements, urban furniture, and signs, such as fluorescent plastic bollards, traffic barriers, asphalt with large marking, do not convey a coherent feeling of urbanity. As proposed by Choay (1992: 195-196), in the era of urban expandability and obsolescence, the urban infrastructure might be the last realm for preserving the identity and continuity of a city. The authors are confident that a morphological approach to public space can contribute to a coherent and stable urban space despite a great instability in the private domain.



Figure 4. Dongjin junction plan. Micro level public space analysis and subsequent proposals.

Conclusions

In this paper, we discussed the framework and three-level approach for introducing urban morphology study in the urban design department of the city of Daegu, Korea. The research identified the various limitations faced by urban form approaches, notably in terms of legal and institutional frameworks, as well as citizen's, planners and other stakeholders' awareness. Nonetheless, realistic propositions can be devised based on in-depth morphological studies of existing urban environments, especially regarding public space. A transverse approach from macro – over meso – to micro level was proposed, aiming to clearly articulate the relation between policy and project and show an explicit transition from research to action. The research noticed the necessary collaboration between academia and practice, but also existing frontiers. Solid academic research on local urban morphology is a prerequisite to the development of an urban form planning approach that cannot be undertaken by the local planning departments focused on practice.

This research is a preliminary exploration that opens avenues of research in topics such as urban morphology in recent settlements, urban form practice in adverse context, or the relation between urban morphology

and public space design. The development of the current research, as well as the input of a configurational approach, also remains to be conducted.

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