

Determination of “FORM” Attribute in Urban Morphology

Alireza Arsiya Ravari^{1*}, Mehrdad Mazloomi²

¹M.Sc. in Urban Planning –Department of Architecture and Urbanism, Qazvin Branch, Islamic Azad University, Qazvin, Iran

²Assistant professor in Urbanism - Department of Architecture and Urbanism, Qazvin Branch, Islamic Azad University, Qazvin, Iran

Received: April 21, 2014

Accepted: June 13, 2014

ABSTRACT

Form is defined as a spatial distribution pattern of human activities which can be subjected to variations in different times. Urban form can be regarded as collection of several concepts and elements of city structure consisting of street patterns, block size and shape, street design, component configuration, parks, public spaces, and etc. the present work was formulated in order to determine the “form” attribute in urban morphology. For this aim, brief descriptions of urban passages and block were presented. Passage is known as one of main morphological dimensions shaping urban block and form. Seven indices of passage were explained. Furthermore, blocks can be regarded as the main element of “form” in urban morphology and they are classified into fourteen elements.

KEYWORDS: Form – passage – block – urban morphology.

1- INTRODUCTION

Nowadays, morphology of a region has changed to a multidisciplinary area in which there is a blend of geography, economics, urban planning, statistics, sociology, and etc. [1]. Understanding morphology helps urban planners be aware of development of regional patterns and change processes [2]. Urban morphology information consists of various descriptions such as road information, construction zone, altitude, and etc. [3].

Urban morphology is an attitude toward studying and designing urban form systems with regard to physical and urban dimensions from plots, blocks, streets, and open spaces which are parts of historic-evolutionary growth of a city [4].recognition of development in urban views in long terms as well as knowledge on cultural, social, economic, and political effects in various times are important morphological principles which enable urban views to be officially known across generations as a manuscript mirroring investments and achievements [5].

Understanding morphological patterns rather than temporal and spatial variations can be a very important factor for recognition of socio-economic, natural, and technological phenomena in relation to contemporary urbanism [6].

“Form”, “urban brilliance”, and “time” are three main attributes in urban morphology. The attributes can be vividly seen in all studies performed by geographers, architects, and those concentrating on cities in the middle ages as well as Baroque and contemporary cities [7].

“Form” is one of crucial subjects of 21st century in relation to city stability. Form is defined as a spatial distribution pattern of human activities which can be subjected to variations in different times [8]. Urban form can be regarded as collection of several concepts and elements of city structure consisting of street patterns, block size and shape, street design, component configuration, parks, public spaces, and etc. Due to its various economic, social, and environmental effects, urban form can direct a city toward either stability or instability [9].

With regard to what mentioned above, the present work was formulated in order to determine the “form” attribute in urban morphology. For this aim, brief descriptions of urban passages and block were presented and then morphology of passages and blocks were elucidated.

2- DEFINITION OF URBAN PASSAGE AND BLOCK

“Passage” in urban areas points to streets, alleys, etc. in cities. Urban sociologists have attributed vitality and urbanity of a city to its open spaces. Jacobs (1961) believes that thinking of a city means imagination of its streets. In addition, those who pay more attention to perception of environment considered ways as organized factors in human’s mental mapping [10].

*Corresponding Author: Alireza Arsiya Ravari, M.Sc. in Urban Planning –Department of Architecture and Urbanism, Qazvin Branch, Islamic Azad University, Qazvin, Iran. E-Mail: Alireza.arsiya@yahoo.com

Proximate parts attached by buildings should be surrounded which has got three variables namely block size, spaces ratios, and corner turn [11].

3- PASSAGE MORPHOLOGY

Passage is known as one of main morphological dimensions shaping urban block and form. Seven indices of passage are as follows:

3-1- Number of passages in each block

Number of passages in each block is counted (Fig. 1). It should be noted that branches of passages are not considered in the number of passages in each block. As it can be seen in Fig. 1, seven passages entered the block.

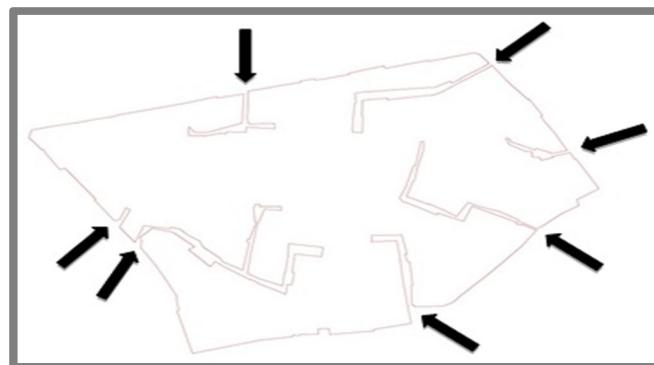


Figure 1: Number of passages in a block

3-2- Length average

Length average is obtained by sum of lengths of all passages divided by the number of passages. For example, in Fig. 2 (a), length average is obtained as follows:

$$34.71 + 23.83 + 12.25 + 21.34 + 48.70 = 140.83$$

$$140.83 \div 5 = 28.166$$

3-3- Width average

Width average is obtained by sum of widths of all passages divided by the number of passages. For example, in Fig. 2 (b), width average is obtained as follows:

$$2.24 + 4.37 + 3.79 + 4.27 + 5.35 + 2.69 = 22.71$$

$$22.71 \div 6 = 3.78$$



Figure 2: (a) Length average; (b) Width average

3-4- Permeability

The blocks over half of whose passages are <6 m wide are regarded as impermeable blocks. In other words, when availability to the texture is limited, i.e. the local passages are >6 m wide, the texture is considered as impermeable [12]. So, it can be claimed that if passage width is over 6 meters, it is regarded to be permeable.

3-5- Passages orientation

Passage orientation is defined on the basis of geographical directions which are divided into two groups namely "north-south" and "east-west". For instance, passage orientation in Fig. 3 is considered "north-south".



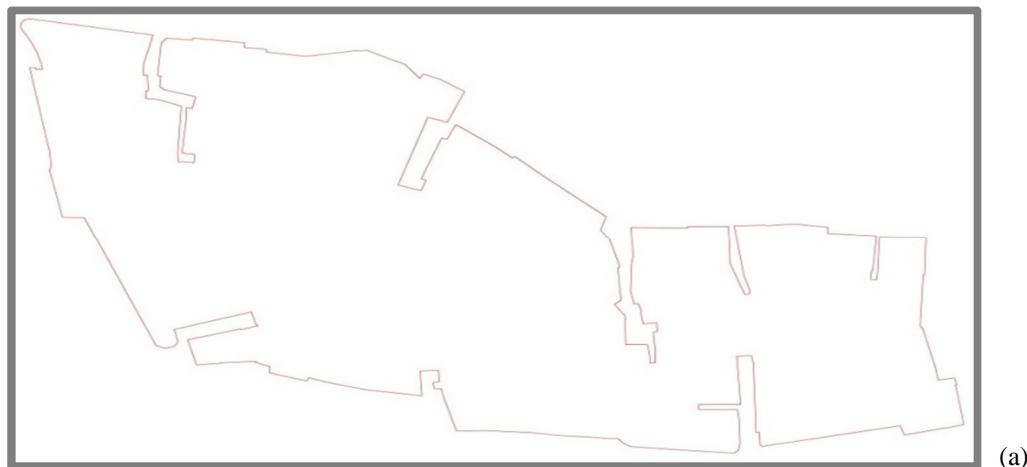
Figure 3: North-south orientation

3-6- Passage slopes

It is the average of slopes of all existing passages in blocks and around them.

3-7- Distribution

Distribution is used to define various types of passages entering blocks. There are three main groups of distributions, namely linear, tree, and network. In linear distribution, the passage enters directly into the block and it has some branches while keeping its linear state. In this state, each passage is linear without any change in direction (Fig. 4 a). In tree distribution, the passage is divided into branches on the left and right covering the block (Fig. 4 b). In network distribution, passages are divided into the block as parallel lines in one direction mirroring a network or part of it (Fig. 4 c).



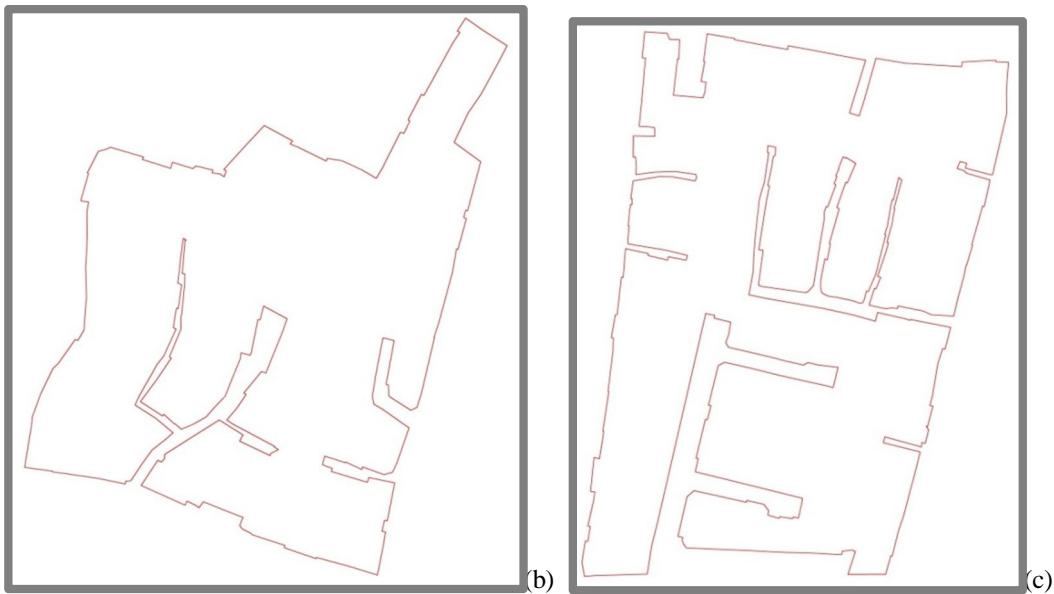


Figure 4: Distribution; a: Linear; b: Tree; c: Network.

4- BLOCK MORPHOLOGY

Effect of natural environment on architectural spaces has not been only by construction materials. Effect of natural environment is comprehensive and consists of various phenomena such as climate, altitude, proximity to sea or river, geological structure, and etc., each of which has an important role in spatial composition of buildings [13].

Form and structure variations in a city occur when blocks and related parts are subjected to some variations in relation to different parts of the city along with the city's growth process [8]. Street patterns are considered as the basis of urban blocks such as public spaces, transport channels, or public networks. Blocks define spaces and spaces define block [2]. Therefore, blocks can be regarded as the main element of "form" in urban morphology and they are classified into 14 elements (Table 1).

Table 1: Elements of blocks morphology

Elements	Definition	Measurement
Occupancy coefficient	Total area of block divided by the land area occupied by buildings in block	Percent
Building density	Ratio between infrastructure area and land area	Percent
Number of areas in each block	Number of areas in block	Number
Average number of floors of buildings in each block	Average number of floors in blocks	Number
Block area	Area of each block	Square meter
Distance from block to river	Distance from each block to river	Meter
Overall form of areas in block	According to geometrical form of areas in block	-
Placement of proximate areas in block	The form made by placement of neighboring areas in block	-
Overall orientation of areas in block	Overall orientation of areas in each block on the basis of geographical directions	-
Overall form of yard	Based upon placement of open space to building	-
Granularity	According to area of parts in each block	-
Granularity distribution	Regularity, conformity, and size of areas in block	-
Block orientation	Block orientation according to bigger length	-
Overall form of block	Overall form of block which has the most overlap with defined geometrical shapes	-

5- CONCLUSION

As a broad science, urban morphology is comprised of variety of sciences and consists of numerous research and theories [14]. Morphology has variety of definitions. "Form" is one of the most important dimensions of urban morphology.

Golany (1995) believes that urban planning with regard to climatic situation is related to a comprehensive urban morphology. He introduced parameters in order to evaluate cities in terms of morphology such as street width, form, configuration and orientation, building height, urban densities and sprawls, urban open spaces, land use incorporation or separation, etc. More accurate determination of this needs a clearer recognition and classification [15].

A city is nothing but blocks and passages. Therefore, "form" in urban texture can be considered from two viewpoints namely passages and blocks. Form recognition in urban morphology is based upon two qualitative and quantitative principles. The qualitative dimension is the most important part and overall structure of the area can be achieved by analyzing this dimension. The latter dimension is measurement by which such information as densities, floors, distances, areas, etc. A combination of qualitative and quantitative dimensions can provide a comprehensive analysis of urban morphology.

Therefore, incorporation of passages and blocks according to morphology and measuring various dimensions can be regarded as a silver bullet for achieving success and prosperity in urban morphology and the combination will help authorities understand philosophy of urban morphology in a better and more efficient manner.

REFERENCES

- [1] Caglioni, M., Lombardini G., Rabino, G. (2005); "fractal morphology and social-economic structure: three Italian cases studies (Milan, Turin and Genoa)" abstracts of 14th European Colloquium on Theoretical and Quantitative Geography.
- [2] Behzadfar, M., Sanei, M. (2012) Determination of urban morphology in Firoozkooh, National Conference on Urban View, Volume 3, Daryaft Publications.
- [3] Sievinen, P. (2011); "Retrieval of Urban Morphology by Means of Remote Sensing" Thesis for the degree of Master of Science in Technology, Aalto University.
- [4] Sanders, P.S. (2008); "Presenting the past: the impact of urban morphology in shaping the form of the city" ACSP-AESOP 4th Joint Congress, Bridging the, Divide: Celebrating the City, University of Illinois, Chicago.
- [5] Larkham, P.J. (2006); "The study of urban form in Great Britain" Urban Morphology (2006) 10(2), 117-41.
- [6] Rashed, T., Weeks, J.R., Stow, D., Fugate, D. (2005); "Measuring temporal compositions of urban morphology through spectral mixture analysis: toward a soft approach to change analysis in crowded cities" International Journal of Remote Sensing, Vol. 26, No. 4, 699–718.
- [7] Moudon, A.V. (1997); "Urban morphology as an emerging interdisciplinary field" Urban Morphology 1, 3-10.
- [8] Azizi, M.M., Arasteh, M. (2011) Determination of urban sprawl according to building density, Iranian Journal of City Identity, Vol. 8, no. 5, p. 6.
- [9] Seifoddini, F., Ziari, K., Poorahmad A., (2012) Determination of urban form sprawl and compression in Amol with regard to sustainable urban form, Journal of Human Geographical Research, no. 80, p. 157.
- [10] Noghsan-Mohammadi, M.R., Dehghan, F., Montazeri, M. (2012) Designing local-oriented urban space in new urban developments: a peace between development and sustainability with emphasis on local-oriented designing in streets of Yazd, Journal of City and Local Architecture, no. 2, p. 86.
- [11] Towers, Graham (2005); "In introduction to urban housing design at home in the city", Architectural press, an imprint of Elsevier, p. 105.
- [12] Jahanian, M., Pazhoohan, M. (2011) Determination and classification of various urban eroded parts in Tehran and interventions relative to this problem, Iranian Journal of Human Geography, Vol. 3, no. 2, p. 98.
- [13] Soltanzadeh, H. (2011) Role of geography in formation of various kinds of yards in Iranian traditional houses, Iranian Journal of City Identity, Vol. 5, no. 7, p. 72.
- [14] Whitehand, J.W.R. (2007); "Conzenian urban morphology and urban landscape" Proceedings, 6th International Space Syntax Symposium, İstanbul, p. 1.
- [15] Golany, G. (1995); "ethics & urban design, culture, form & environment", Canada, John Wiley & Sons, Inc, p. 148.