

The Efficient Use of Private on Open Space through a Correlation Analysis between Space Type and Street -Focusing on Local St. at Yoido Capital St.

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Hee Hyoun Hwang

Sejong University, Korea, Department of Architecture, Seoul, Republic of Korea
nsg7@hotmail.com

Young Ook Kim

Sejong University, Korea, Department of Architecture, Seoul, Republic of Korea
yokim@sejong.ac.kr

Heang Woo Shin

Sejong University, Korea, Department of Architecture, Seoul, Republic of Korea
goddn_73@hotmail.com

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Abstract

Republic of Korea was very successful in laying the groundwork for local cities in a short time, but it focused rather on quantitative growth than on qualitative aspect in terms of physical urban environment. However, it needs to review and improve the quality of physical urban environment and several projects are already underway as people's interest in improving the quality and pleasantness of urban environment is rising these days. The security of private on open space' introduced by a revision of Korea's Construction Law in 1991 is in line with such a trend.

Private on open space is public space in private land and is a planned outdoor space open to the public all the time. As part of walking environment or being connected with it, open space aims to provide amenity to the lives of citizens such as recreational activities, resting spots, sceneries and convenient walking. Nonetheless, current private on open space doses not meet public purposes due to lost of its original purposes. Instead, it is being used in different uses or is even interrupting pedestrians' walking, which is growing its negative aspect.

In such circumstances, the purpose of this study is to provide useful data for preparing improved measures for future private on open space plans and their promotion. In order to do, it is needed to analyze basic problems of private on open space through research on its types and relation with neighboring streets because open space plays an important role as part of urban public space. This study method roughly consists of three phases. First, data of areas condensed with business buildings of 5,000 m² or over in terms of total floor area was collected on the basis of drawings and documents. Then, based on the collected data, the development status of private on open space was confirmed and revised in person, and its types and use habits were surveyed. Lastly, the study proved the importance of the relation between private on open space type and its neighboring streets by analyzing and interpreting the correlation between private on open space type and accessibility after calculating accessibility to private on open space from streets and syntactic values using the space syntax theory.

1. Introduction

1.1 Background and Purpose

Republic of Korea had focused on quantitative growth not on qualitative aspect in terms of physical urban environment despite of its successful groundwork for local cities in a short time. Therefore it is needed to seek the formation of Private on open space which is one of current urban problems. Private on open space is public space in private land and is a planned outdoor space open to the public all the time. As a part of walking environment or being connected with it, Private on open space aims to provide amenity to the lives of citizens such as recreational activities, resting spots, sceneries and convenient walking. Nonetheless, current Private on open space is not meeting public purposes by losing its original purposes. Instead, it is being used in different uses or is even interrupting pedestrians' walking, which is growing its negative aspect. In such circumstances, the purpose of this study is to provide useful data for preparing improved measures for future Private on open space plans and their promotion. In order to do, it is needed to analyze basic problems of Private on open space through research on its types and relation with neighboring streets because Private on open space plays an important role as part of urban public space.

1.2. Methods and Contents of study

This study had been focused on the private on open space where is formed on office buildings which are over 5,000 square meter located on the urban center. It is also concentrated on where the width and private on open space can be easily seen. Therefore Yoido office location where is a densely office facilities district and highly rises the problems of private on open space is analyzed. This study chooses Yoido area, and embodies private open space types and formations such as parcel configuration, formation faced to street, building area, and private on open space area. In addition, integrations are measured by relations between private on open space and around streets and Space Syntax. And it is judged whether original purpose of private on open space is suitably operated by usage frequency.

2. Theories

2.1. The notion and peculiarity of Private on open space

2.1.1 Notion

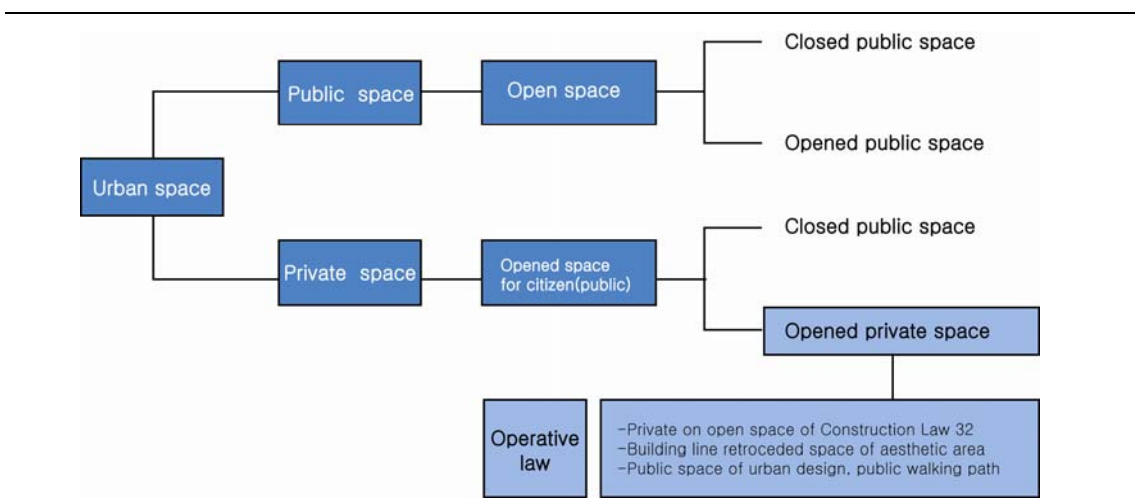


Figure1

Private on open space conceptual diagram

The term of Private on open space is currently used on the Construction Law and urban design. Focusing on 'open space' and 'public space', it can be defined as follows. Above all, open space is divided into 'urban open space' and 'land open space'. The urban open space means undeveloped

hollow land such as building-to-land area, undeveloped area, reserved developed area, the remainder area, and so on. The land open space means hollow area without buildings or pilotis, but currently the meaning is changed to stress on actively functional area such as walking and rest.

The term, 'public space' is used together with private on open space. It is generally defined as major facilities or public space to secure leisure space for citizen, path for pedestrians, countermeasures against natural calamities, preservation for scenery, and nature protection in urban area by urban planning law.

'private on open space' has been partly used on researches and reports of research institutions so far. In 1991, it was introduced by the revision of Construction Law and defined as an open place all the time for rest and walking for public in private land.

2.1.2 Function and peculiarity

Charles Eliot, Christopher Turnard, Boris Pushkarev, Stanley B. Tankel, Ann Satterthwate, George T. Marcou and Hwang Kiwon mentioned the function of the private on open space. Following them, the private on open space has four specific features. First, it plays producing function related to preservation of natural resources and controlling of environment. Second, it has convenient function which provides recreation, transportation, and disaster prevention. Third, it has urban function by way of prevention of urban expansion and inducement of urban development. Fourth, it plays a role in purifying visual environment of urban.

The private on open space plays a role not only the natural function but also biological, architectural, urban function. In other words, it plays its own role as walking and leisure functions, and has additional functions as well: first, biological role as protection and preservation of natural resources and environment control functions, second, building role as connection to lower floors and outdoor spaced functions, and last, urban role as prevention of urban expansion and inducement of urban development, connection with surrounding area, and urban scenery function.

Function	Role
Original function	<ul style="list-style-type: none"> · Walking space · Space of rest and use for off hours
Ecological function	<ul style="list-style-type: none"> · Protection and preservation of natural resources · Environmental control
Architectural function	<ul style="list-style-type: none"> · Connection with lower floor of building · Outdoor space of buildings
Urban function	<ul style="list-style-type: none"> · Prevention of urban expansion and inducement of urban development · Connection with surrounding area · Urban scenery

Table 1

Function and role of private on open space

2.2. System of private on open space

2.2.1 Construction Law 32. 2.

In order to make comfortable, buildings with scopes and uses by Presidential decree must have open spaces such as small leisure facilities which are served to publics. [revised 2.8.1999 Law 5895]

2.2.2 Enforcement Ordinance 113.

Followed the law 67. 1, the ground of buildings must ensure open space or private on open space. [revised 4.30.1999, 7.18.2005, 5.8.2006]

2.2.3 Regulations Seoul city 22.

Followed the law 114. 1 and 2, such buildings and area which must have open spaces are as follow.

2.2.4. Enforcement Ordinance about reform and use the land 46. (Alleviation of Building-to-land Ratio within District Unit Plan)

In the case of people who try to build in District Unit Plan provides infrastructure which are laid down by public facilities such as schools and city plan regulations, the building-to-land ratio, floor space index and height limitation can be alleviated by the law 52. 3. [revised 9.8.2005, 3.23.2006]

2.3 Analysis of preceding researches

The studies focused on private on open space were introduced in late 1980s and has been paid attention in 2000s. A study on the Effect of Factors on the Use of Private-owned Pocket Parks(Jang Ha-Ri, Lee In-Sung, 2006) urges that even though incentive of current private on open space composition is applied by the area of private on open space, it can be influenced by not only the area of private on open space, but also scale of buildings, accessibility and openness of private on open space, traffic and population round about private on open space, and the use of lower floor of buildings.

The Effect of Location Factors on the Use of Public Open Spaces (Song Jean-Hwa, Ahn Kun-Hyuck, 2004) confirms that standard of original open space. It, however, proves that the effects of buildings for real use and general pedestrians are low, and the shorter distance with public transportation such as bus and subway stations increases the number of users in terms of location factors analysis.

An Analysis of the importance and satisfaction by urban private on open space types (Ho Chang Ki, Jeon Min Seok, Kim Hong Kyu, 2008) gives that indoor front arrangement has high level through the assessment of user satisfaction.

The Study on the Utilization of Public Open Space as Urban Space in Fukuoka, Japan (Pyon Hye-Seon, 2006) shows difference of utilization by the private on open space types. The preceding researches are concentrated on the factors of private on open space use and satisfaction of users. This study, however, have focused on the relations between formation of private on open space and streets and showed better approachable patterns of private on open space for outside users.

3. Study Method

The analysis items are such that area of open space, ratio, pattern, relations with circumference, length of faced street, integration, and the number of utilizations.

3.1 Parcel configuration and open space

The area of open space is private space which is not for individual, but spared area for publics. It is expected to have influence on using. The measurement is depended on the area of CAD drawing.

3.2 Making types of private on open space

This study makes a difference with current types of private on open space through considering preceding researches. This offers more detailed patterns of open space through using shelters which pedestrians cannot use due to its gap of level between roadways and pedestrian passages such as indicating borders or territories with private on open space not to simply embody the location of open space.

3.3 Width of pedestrian passages connected to street

The main aim of the private on open space is distribution to public. So that width measurement of pedestrian passages is needed because the connection between street and private on open space has great influences. The measurement is depended on the area of CAD drawing.

3.4 Space Syntax

This study uses Depthmap 7.12 to analyze VGA. Depthmap 7.12 which is a method for analyzing urban and building space structure deduces features of space structure by dividing space plane with a cell unit. This gives quantitative measurement of integration in private on open space.

3.5 Analysis of correlations through SPSS

The factors which have influence on users of open space are analyzed by using SPSS 11.0 program. In addition, it shows more objectified analyses through separating the factors closely related to users.

4. Analysis

4.1 Selection and Present Condition

This study selects building construction area where has numbers of open space located in street where substantial numbers of pedestrians use within urban area. Yoido-dong Yeongdeungpo-gu where is presented as a business district with Gangnam-gu, Seocho-gu, Jongno-gu, and Jung-gu in Seoul are judged as suitable areas for the purpose of this study. Yoido-dong Yeongdeungpo-gu where business district and most finance institutions including capital and stock exchange are located is a central place of politics and economics. However, the connection between streets and open space is insufficient compared to bigger buildings and thoroughfare which are made up of great axis. Moreover, this area as a mixed street between pedestrian passages and roadways is lack of detailed formation standards in open space albeit it is in danger of safety of pedestrians. What is more, it makes hindrances on walking because it tends to be separated from major walking due to the troubles of gap of level between roadways and pedestrian passages with streets or flower beds.



Figure 2
Objected area locational diagram

street	street	street	Street	street
Type 1	Type 2	Type 3	Type 4	Type 5

Table 2
Making types of preceding researches

4.2 Formation patterns and private on open space types

As a result of discovering the features of preceding researches, they are concentrated on the location of private on open space based on the notions of buildings and open space.

Therefore, this study makes a difference with preceding researches and embodies patterns by separating locations in the buildings of private on open space and flower beds or shelters which are most of the composition of private on open space. This also analyses what effects play a decisive role in use of pedestrians.

Pattens	TYPE A Ground boundary type	TYPE B The Front Closing type	TYPE C Opened Landscape Architect type	TYPE D The Front Open type
Explanation	Pattern which indicates territory using private on open space	Pattern which is impossible to be approached by outside through establishing flower beds in the front	Pattern which expresses private on open space by establishing landscape architect with appropriated interval in the ground.	Pattern which the whole space is used as private on open space by opening all the front.
Diagram				

Table 3

Making types of private on open space

The research area is embodied as four types through sampling after dividing and diagramming private on open space surrounded by shelters and buildings. The biggest patterns are type A (Ground Boundary Type) which indicates territory using private on open space and type B (the Front Closing Type) which makes obstacles for pedestrian's use. And what is more the two types, type C (Opened Landscape Architect Type) which establishes landscape architect focusing on pedestrian's convenience and type D (the Front Open Type) are found.

4.3 Analyses of private on open space type

TYPE	TYPE A'	TYPE A''	TYPE B'	TYPE C'	TYPE C''	TYPE D'	
Name	Sindonghae building	Dusan building	Deaha building	Youngsan building	KCC building	Geukdong building	
Drawing							
Real image							
Present use status	total	14	4	6	11	36	25
	inside	14	2	4	3	4	9
	outside	2	2	2	8	32	16
Area of private on open space	253.54m ²	213.71m ²	406.09m ²	153.44m ²	519.94m ²	361.87m ²	
Ratio of plottage versus private on open space	42.9%	24.5%	28.4%	21.0%	16.4%	31.3%	
Width of pedestrian connected to street	18m	7m	23m	20m	73m	79m	
Integration	6.64299	6.09217	6.47513	6.93361	6.93361	7.72443	

Table 4

General present status and types feature of private on open space

The number of private on open space users is a result of observing people who use private on open space in each building respectively including walking space if it is used as communication and rest place not to mention leisure or rest space. It is largely because buildings which do not provide private on open space have a great influence on the number of private on open space use because the location causes increasing the number of pedestrians. Hence, the users were observed by dividing as two parts, insider of the private on open space and outsider. The rationale behind this is that it is needed to check how many outsiders utilize the private on open space rather than insiders in order to achieve the original purpose of establishing private on open space which is publics can use all the time by opening private land. The biggest use is KCC building, then comes Geukdong building, Sindonghae building, and Yongsan building. This is related to the patterns of private on open space and the result that type C is bigger than type D albeit type D is more active than type C shows the business conditions of lower floor has influences.

Content	total no. of users	content	total no. of users
Area	.245	Area	.168
Ratio(rate)	.466	Ratio(rate)	-.136
Width	.887*	Width	.912*
Integration	.911*	Integration	.956**

*p<.05, **p<.01

Table 5
Correlations between users and analyzing factors



Table 6
Integration by Space Syntax

The number of usage has a high correlation with the width of pedestrian connected to street and integration. This means that openness and integration play significant roles in using private on open space.

The area of private on open space is in order of KCC building, Deaha building, and Geukdong building and it is deduced that the area does not effect on the number of users. The result of analyzing integration between street and private on open space through Space Syntax, KCC building and Yongsan building show great value. It proves that there exists correlation between pedestrian width and street presented openness and amount of usage.

Lastly, the private on open space type shows the most ideal types are type C and D which have a great accessibility and openness.

5. Conclusion

This study was started from a query whether private on open space in Capital St. Local St. provides convenience to users and plays adequate role and function to original purpose. The purpose is finding basic sources of newly improved private on open space by sampling patterns, analyzing present user status, finding influential factors on use, and understanding importance. The results of this study are as follows. Firstly, openness is the most important factor for planning private on open space. In order to meet the condition, the street width faced to private on open space should be broad. It can cause increasing number of users as we know from the analysis. Secondly, the area and ratio of the private on open space does not have influence on using private on open space and it proves that the bigger place is not the better private on open space. Thirdly, the analysis of integration between private on open space and street faced to it proves that integration and use of the private on open space are highly correlated and accessibility for users is significant. Lastly, the making patterns of private on open space gives the most ideal pattern is a type with good openness and accessibility.

In the research area, Yoido, private on open space is used as parking lot due to its absence of parking area, so that it is difficult to find exact features and use pattern of private on open space. Hence it has a limitation to know whether public leisure facilities and the types of business in low floors play important role on using private on open space because it is focused only on arrangement status of private on open space and shelters.

It is needed to improve previous techniques and study about street patterns upon the private on open space types in street. It will give guideline for efficient use of private on open space and contrive improvement of street and revitalization of street.

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