

The Effects on the People's Preference on the Cityscape by the Spatial Characteristics of the Streetscape-Centered on 'Design Seoul Street'-

Eun-JungKo, Bur-Deul Yoon,Sung-Won Choi and Hong-Kyu Kim

Abstract—Jacobs, A.B. (1993) stated that "When I think of a city, the first thing that comes to mind is the street. If the street is interesting, the rest of the city is interesting. If the street is mundane, the city is also mundane." In this statement, he expresses the importance of the streetscape and the street environment. The objective of this paper is to analyze the spatial relationships of the streetscape that affect the general public's preference of the cityscape. Furthermore, this research focuses on the important role that streetscape plays in public perception of the city by the pedestrians who experience it daily. The subject of this paper is eight of the "Design Seoul Street." The analysis and survey results show the preference criteria that affect the streetscape and ultimately the cityscape. This research endeavor shows that differences in physical form, shape, size, color, locations, and context are important.

Keywords—Cityscape,Design Seoul Street, street, streetscape.

I. INTRODUCTION

STREET is a symbolic place that expresses attractive atmosphere and cultural historicity of a city. Jacobs, A.B. (1993) stated importance of the street by telling "When think of a city, the first thing that comes to mind is the street. If the street is interesting, the rest of the city is interesting. If the street is mundane, the city is also mundane and boring."In this statement, he expresses the importance of the streetscape and the street environment.

The objective of this paper is to analyze the spatial relationships of the streetscape that affect the general public's preference of the cityscape. Understand reviews the concept, quality and elements of landscape through the literature, look in to the meaning of landscape planning through case studies of Korea.

To make an interesting city, it needs to recognize needs of pedestrians who use streets and meet their requirements. However, because people perceive urban environment differently by many factors like physical environment, personal variables, and so on, there has been many researches considered the variables [6].

For a city planning, it is necessary to not only prove differences of environmental perception from individual to

individual also find solutions to overcome the differences. For that, today, to reduce differences about city environment and make environment for user, it is trying to reflect awareness and opinion of citizens in the environment design field including architect, city planning and landschytaping. However, there are some cases that users are not satisfied with, or do not realize the planner's purpose differently though the plan reflects user opinion [7]. To solve the problems a Post Assessment is made. It makes to look back designed environment on users' side by evaluating environment about a specific evaluation criterion after planning and construction. However, theoretical basis and specific study are not sufficient, and it is not under active progress in Korea. Although street space is a very important factor in urban space, systematic and concrete study is insufficient because the components are complicated and comprehensive. Therefore, this research focuses on analyzing the spatial relationships of the streetscape that affect the general public's preference of the cityscape or the image of the city to reduce the difference about environmental perception of pedestrians and suggest environment for users. A concept, a feature and factors of a streetscape is understood through theoretical inquiry. Meaning of streetscape planning is also covered in this research by case study. Topic of this research is divided into three subjects. The first one is the differences in before and after construction of the streetscape. Second subject is in terms of location differences between Gangnam and Gangbuk areas. The last one is streetscape differences depending on type of streets.

II. LITERATURE REVIEWS

A. Meaning of Streetscape

There are three different landscapes by three factors; view, field of vision and distance. One is landscape is relevant to topography and location. Another is townscape related to housing and town. The other is streetscape that people are presented in daily life.

However, Streetscape means not only movement toward a destination but also a comprehensive space including various human lives.

Many factors like such as physical, social, economic and so on effect on image of a streetscape. The streetscape is a decisive factor that influences over people to form the image of landscape. The streetscape also has directivity, continuity and identity.

1. Perceptual Continuity

The perceptual continuity means flat, spatial and temporal continuity. Flat continuity stands for mental continuity that people feel while they are walking down the street. Meaning of spatial continuity is including streetscape and buildings on a street, and it is based on a phenomenon that is detected by

Eun-Jung Ko is with the Urban Planning and Engineering College of Engineering Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-749, Korea (phone: 82-2-2123-2891, fax: 82-2-393-6298; e-mail: dojee@nate.com).

Bur-Deul Yoon is with the Urban Planning and Engineering College of Engineering Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-749, Korea (e-mail: audreybde@hotmail.com).

Sung-Won Choi is with the Urban Planning and Engineering College of Engineering Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-749, Korea (e-mail: won193@hanmail.net).

Hong-Kyu Kim is a professor with the Urban Planning and Engineering College of Engineering Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-749, Korea (e-mail: hkim56@hanmail.net).

human's visual perception. Temporal continuity includes physical factors and notion of time, and covers cultural factors[4],[5].

Because of the perceptual continuity, when people walk along the street, they perceive a change of building's form, proportion of scale, color, texture and so on. The facade design of buildings on a street gives people continuity of experience, and brings about emotional response. Therefore, streetscape is experienced continuously and developmentally, and organic composition and disposition of buildings on a street have great effect on space formation of streetscape.

2. Perceptual Identity

Streetscape is infinite parts of urban, and it has sense of space that is formed with visual identity. To understand a perceptual identity about streets, clues that show buildings have connections with the surrounding environment are needed. Exterior design of the buildings increase identity and emphasize sense of space by giving each factors that compose façade and visual features. To contribute to increase of identity, the features and meaning of space should be considered for the design.

3. Component of Streetscape

Component of streetscape classified into two elements, physical and non-physical. The physical elements include nature elements, such as climate and topography, and complex elements like loads, buildings. Non-physical elements contains artificial and behavior elements.

B. Management of Streetscape in Korea

1. Design Seoul Street

Businesses about streetscape of Korea lacked organic integration of street elements. The image of street is formed by merging each buildings and facilities. However, because street environment improvement projects are processed without mediation of the factors, it was hard to maximize the effect of the project. People also did not realize many differences of the streets after the projects. Therefore, it has been raised to form a stream between streets, and 'Design Seoul Street' project has been in progress since January 2011. The project aims an emptying street, an integrated street, a collaborative street, and a sustainable street [2].

Public facilities that disrupt pedestrians and disordered signs are repaired to make the emptying street. One of the strategies of the project is creating pleasant and relaxed streets. For the integrated street, many design factors are needed. The collaborative street is made whole project by 'Project Promotion Committee' that consist landlords, civic groups, specialists and so on [2].

The sustainable street needs centralized management after construction to prevent obstacles to walk, rest and street fine view. Then, it is possible to make street better for walking and staying. Moreover, cultural activities like small street performances, exhibitions and so on are grafted onto a street, so the street is not just a road; it is a place for enjoying.

Creation of Design Seoul Street is important because it change recognition about streetscape and include recovering citizens' walk that has been alienated. The component of urban design maximizes public design effects on the projects by making the integrated design street, and the component

performs a role as a detailed action plan for realization of upper plans. This project ultimately plans to contribute to regional economy activation by making place that give many benefits including not only physical satisfaction but also cultural and economical benefits.

2. The Street Where People Want To Walk

One example of government projects for a streetscape management is The Street where People Want to Walk. The project was established on July of 1998, and solving the general problems of streetscapes of Seoul and securing citizens' quality of walking were its purpose. For the project, public institutions promote plans. The plans include expanding crosswalks, making streets without vehicle, creation safe streets, and improvement of underground streets [1].

The result of the project shows improvement of streetscape environment. Also, the base for build of database about planned blueprints and paving, facilities for streets, and integrated street design has been achieved, and it offers opportunity to make an actual system for expansion of street business.

3. Making the Renaissance on the Seoul Street

Goal of the Making the Seoul Street Renaissance was creation of happiness spaces for the citizens by building flat, peaceful, and beautiful streets. The target area was about 488km, and usual repair and planned reconstruction were on the progress from January of 2008 to December of 2010. To improve the quality of streets many guidelines and standards were written, and those applied to every related business. There was an additional plan to repair symbolic streets, streets that connect to the main streets and disconnected streets. Streets of downtown that tourists and citizens use a lot had high priority, and when doing the project, events like HI Seoul Festival was considered. The project was divided into two ways by importance of the street and Deterioration. One is an entire improvement that is including a design factor, and the other is partial improvement [3].

III. RESEARCH METHOD

A. Site Selection

The subject of this paper is four of the "Design Seoul Street"(out of 50) that have been completed and four of the streets that have not been renovated yet.

TABLE I
SELECTED STREETS AS AFTER CONSTRUCTION

Location	Length	Feature
Gang-nam boulevard, Gangnam-gu	760m (Wide: 50m)	an important road center. lots of company located, a large floating population
Banpoero, Seocho-gu	770M (Wide: 40m)	variable cultural facilities
Daehakro, Jongro-gu	500m (Wide: 40m)	a concentration area of small art halls, modern cultural assets, an area for variable festivals
Tongilro, Eunpyung-gu	Length:1,060 M (Wide: 35m)	a gateway of exchange between south and north Korea, an interchange of Eunpyung New Town

TABLE II
SELECTED STREETS AS BEFORE CONSTRUCTION

Location	Length	Feature
Apgujeongro, Gangnam-gu	500m (Wide: 40m)	mixed area for residence and commerce. many pedestrian movement, a lot of schools are located
Suhkyoro, Mapo-gu	508m (Wide: 20 ~ 35m)	cultural axis of the midwest of Seoul, near the Seoul Street Renaissance
Banpo-ro, Seocho-gu	570m (Wide: 40m)	extension of the existing Banpo Design Seoul Street, form a cultural axis from Banpo bridge to Seoul Arts Center
Tongilro, Eunpyung-gu	Length:950m (Wide: 35m)	extension of the existing Tongil Design Seoul Street. expect to effect on regional economy

TABLE III
SITE SELECTION: BEFORE AND AFTER CONSTRUCTION

Construction stage	Target areas
After construction	Gang-nam boulevard, Daehakro, Banpoero, Tongilro
Before construction	Apgujeongro, Suhkyoro Banpoero, Tongilro

TABLE IV
SITE SELECTION: AREA TYPE

Area type	Target areas
Gangnam	Gang-nam boulevard, Apgujeongro, Banpoero
Gangbuk	Daehakro, Suhkyoro, Tongilro

TABLE V
SITE SELECTION: STREET TYPE

Street type	Target areas
Commercial	Gang-nam boulevard, Apgujeongro
Culture	Banpoero, Suhkyoro
Business	Banpoero
Living	Tongilro

B. Survey Method

In order to judge the visual qualities of each street, evaluations were made on site. The pedestrians that used these streets were given evaluation survey forms to fill out. The method used was to have a preliminary and final survey. This study surveyed 320 pedestrians for the preliminary study and 400 pedestrians for the final survey.

C. Analyze Method

In order to estimate the statistical qualities of the survey, frequency analysis, descriptive statistics analysis, independent samples t-test, one-way ANOVA were used on subjects of this study.

To verify the three topics of the research, SPSS 12.0 statistics package was utilized to achieve the quantitative analysis. This was determined at 95% guideline to accept or reject the results.

IV. ANALYSIS RESULTS

A. The Social Studies

The social studies indicate that the male population value order and symbolism. The males with less than middle school education prefer naturalness and forms in the physical sense. In the social aspects, males prefer harmony, pleasantness, safety and ordered spaces.

The age 60 and up prefer cultural and traditional character above others.

When the profession is in farming, fishing, and dairy business, the preference is in the naturalness of the environment. The recognition of the street whether the street is part of the "Design Seoul Street" or not depends on the cultural identity and symbolism.

The frequency of the visits and the preference of the streetscape are not linked closely. If the duration of the visit is less than three hours, the physical aspect of the streetscape is highly valued together with symbolic cultural character. When the stay is less than 30 minutes, above qualities of the streetscape is not valued very much. The reasons for the visit and preference of the streetscape do not have much correlation. If the purpose of the visit is for group activities such as street performance, the form of the space or the environment is highly valued.

TABLE VI
RESULT OF THE SOCIAL STUDIES

Category	Frequency	Percentage (%)
Gender	Male	201
	Female	199
Education background	Less than middle school	22
	High school	110
	Community College	72
	University	169
	Graduate School	27
Age	20's	176
	30's	89
	40's	79
	50's	42
	Over 60's	14
Occupation	Innocent	37
	Housework	37
	Public official	18
	Specialized job	63
	Office job	38
	Service job	30
	Self-employed	37
	Technical post/ Production employee	10
Others		130
		32.6
Awareness of Design Seoul	Yes	164
	No	236
frequency of the visit	First time	38
	3 times a week	152
	1~2 times a week	97
	1~2 times a month	79
	1~2 times a year	34
Duration of the visit	Less than 30 min	97
	30min~1hour	84
	1hour~3hours	119
	Over 3hours	100
	Culture/event	24
Purpose of the visit	Appointment	106
	Ambulation	76
	Rest	25
	Exercise	9
	Shopping	30
	Eat out	10
	Business	79
	Group activities	2
	Others	39
		9.8
Total	400	100.0

B. Effect on Urban Image Preference

1. Image Preference in Terms of Construction Stage

The main difference in before and after construction of the streetscape is that the physical, social, cultural significance is quite apparent. In physical realm, naturalness is important, in social realm, pleasantness, safety, social order is important. In cultural realm, symbolism and uniqueness ranks highest. To sum it up, the development of "Design Seoul Street" has a definite positive effect on the perception of the streetscape and thus the cityscape.

2. Image Preference in Terms of Location Differences

In terms of location differences between Gangnam and Gangbuk areas, there is a definite gap in physical, social and

cultural aspects. In physical aspects, spatial relationships, forms, and locations were the main items. In social aspects, harmony and receptiveness of the streetscape were important. In cultural aspects, cultural icons were the utmost importance.

3. Image Preference in Terms of Street Type

The nature of various streetscape differences hinged on the type of streets studied. The wide commercial streets did not have many physical, social or cultural differences. The reason behind this observation is that these streets were well structured and maintained, thus have less of a quality gap from the renovated "Design Seoul Street."

The culturally themed street showed physical and social differences, but did not have much cultural differences. This is because the streetscape areas had particular cultural symbols or ambiance already and the newly renovated streetscape did not bring a new cultural identity or major improvement to the area.

Meanwhile, the commercial streets only showed difference in the cultural aspects and not much in physical and social realms.

Local neighborhood streets had physical, social and cultural differences based on the fact that most of the users were people living in the immediate area and not visitors from other parts of the city.

4. Physical, Social and Cultural Feature about a Streetscape Image

Local neighborhood streets had physical, social and cultural differences based on the fact that most of the users were people living in the immediate area and not visitors from other parts of the city.

All of the streets showed that by changing the physical aspect of the streetscape, it also affected the social aspects such as harmony, pleasantness, safety, orderliness, and receptiveness that improve with renovation.

The cultural streetscape such as Daehakro and Suhkyoro show that the cultural contents of the streets are the most valued. This reaffirms that in these culturally themed areas, the renovation of existing street does not bring new additional cultural qualities, but recognition of existing specialty of different areas.

5. Overall Analysis

The physical feature of GangnamBoulevard (after construction) shows that spatial contents are most valued, and natural contents are most lacking. Harmony and safety are most valued in the social features, and urbanism is most emphasized among the cultural features.

TABLE VII
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-GANGNAM BOULEVARD
(AFTER CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	3.10
	Naturalness	50	2.67
	Shape	50	3.08
	Color Palette	50	2.88
	Location	50	2.93
Social features	Harmony	50	3.04
	Pleasantness	50	3.00
	Safety	50	3.04
	Orderliness	50	2.93
	Receptiveness	50	2.74
Cultural features	Symbolism	50	2.68
	Urbanism	50	3.37
	Cultural	50	2.92
	Traditionality	50	2.38
	Uniqueness	50	2.79

*** P<0.01, ** P<0.05, * P<0.10

The case of Daehakro (after construction) shows that spatial, harmony, and cultural contents are most valued. However, color palette, orderliness, and traditionality contents are week.

TABLE VIII
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-DAEHAKRO
(AFTER CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	3.56
	Naturalness	50	3.24
	Shape	50	3.51
	Color Palette	50	3.22
	Location	50	3.56
Social features	Harmony	50	3.47
	Pleasantness	50	3.24
	Safety	50	3.14
	Orderliness	50	3.03
	Receptiveness	50	3.36
Cultural features	Symbolism	50	3.32
	Urbanism	50	3.44
	Cultural	50	3.56
	Traditionality	50	2.73
	Uniqueness	50	3.18

*** P<0.01, ** P<0.05, * P<0.10

TABLE XI
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-BANPORO
(AFTER CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	3.04
	Naturalness	50	3.22
	Shape	50	3.06
	Color Palette	50	3.18
	Location	50	3.20
Social features	Harmony	50	3.10
	Pleasantness	50	3.14
	Safety	50	2.84
	Orderliness	50	3.00
	Receptiveness	50	2.86
Cultural features	Symbolism	50	3.02
	Urbanism	50	3.20
	Cultural	50	2.92
	Traditionality	50	2.68
	Uniqueness	50	2.64

*** P<0.01, ** P<0.05, * P<0.10

The case of Banporo (after construction) shows that naturalness, pleasantness, and urbanism contents are favored. However, spatial, safety, and uniqueness contents are week.

TABLE X
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-TONGILRO
(AFTER CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	2.97
	Naturalness	50	3.16
	Shape	50	2.96
	Color Palette	50	2.84
	Location	50	2.93
Social features	Harmony	50	2.80
	Pleasantness	50	3.14
	Safety	50	3.10
	Orderliness	50	3.16
	Receptiveness	50	3.25
Cultural features	Symbolism	50	2.56
	Urbanism	50	2.83
	Cultural	50	2.81
	Traditionality	50	2.58
	Uniqueness	50	2.56

*** P<0.01, ** P<0.05, * P<0.10

The result shows that naturalness, receptiveness and urbanism contents of Tongilro (after construction) are most emphasized. On the other hands, color palette, harmony and symbolism contents are less valued.

TABLE XI
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-APGUJEONGRO
(BEFORE CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	2.76
	Naturalness	50	2.63
	Shape	50	3.08
	Color Palette	50	2.88
	Location	50	3.11
Social features	Harmony	50	2.84
	Pleasantness	50	2.67
	Safety	50	2.70
	Orderliness	50	2.75
	Receptiveness	50	3.04
Cultural features	Symbolism	50	2.90
	Urbanism	50	3.40
	Cultural	50	2.88
	Traditionality	50	2.50
	Uniqueness	50	2.76

*** P<0.01, ** P<0.05, * P<0.10

The physical streetscape of Apgujeongro (before construction) indicates that location contents are most valued, receptiveness is emphasized among the social feature, and urbanism is most valued in the cultural feature. Naturalness, pleasantness, and traditional contents are week.

The result indicates that location, harmony and urbanism contents of Suhkyoro (before construction) are most valued. On the other hands, naturalness, receptiveness and traditionality contents are less valued.

TABLE X II
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-SUHKYORO
(BEFORE CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	3.05
	Naturalness	50	2.67
	Shape	50	3.08
	Color Palette	50	3.08
	Location	50	3.31
Social features	Harmony	50	3.25
	Pleasantness	50	2.64
	Safety	50	2.68
	Orderliness	50	2.50
	Receptiveness	50	2.24
Cultural features	Symbolism	50	3.12
	Urbanism	50	3.47
	Cultural	50	3.38
	Traditionality	50	2.60
	Uniqueness	50	2.92

*** P<0.01, ** P<0.05, * P<0.10

The case of Banporo (before construction) shows that location, harmony, and urbanism contents are emphasized. However, naturalness, safety and uniqueness contents are weak.

TABLE XIII
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-BANPORO
(BEFORE CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	3.15
	Naturalness	50	3.04
	Shape	50	3.05
	Color Palette	50	3.06
	Location	50	3.20
Social features	Harmony	50	3.08
	Pleasantness	50	3.03
	Safety	50	2.94
	Orderliness	50	3.02
	Receptiveness	50	3.04
Cultural features	Symbolism	50	3.13
	Urbanism	50	3.21
	Cultural	50	3.18
	Traditionality	50	3.09
	Uniqueness	50	3.07

*** P<0.01, ** P<0.05, * P<0.10

TABLE XIV
OVERALL ANALYSIS ABOUT STREETSCAPE IMAGE-TONGILRO
(BEFORE CONSTRUCTION)

Category	Number of examples	Average	Standard deviation
Physical features	Spatial	50	3.48
	Naturalness	50	3.04
	Shape	50	3.49
	Color Palette	50	3.04
	Location	50	3.44
Social features	Harmony	50	3.28
	Pleasantness	50	2.92
	Safety	50	3.06
	Orderliness	50	2.94
	Receptiveness	50	3.33
Cultural features	Symbolism	50	3.10
	Urbanism	50	3.36
	Cultural	50	3.11
	Traditionality	50	2.64
	Uniqueness	50	3.08

*** P<0.01, ** P<0.05, * P<0.10

The physical streetscape of Tongilro (before construction) indicates that shape contents are most valued, and receptiveness is emphasized among the social feature, and urbanism is most valued in the cultural feature. Naturalness, pleasantness, and traditional contents are not coordinated.

V. CONCLUSION

The above analysis and survey results show the preference criteria that affect the streetscape and ultimately the cityscape. This research endeavor shows that differences in physical form, shape, size, color, locations, and context are important. However, the public's preference was not evaluated with these criteria. Therefore, if these aspects were incorporated with the survey before and after the renovation, a more accurate assessment and evaluation data will be collected for further discussion and research.

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