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TOURbanISM-toURBANISM

**Analysis on City Tour Routes
in relation to Urban Spatial Structure
and Pedestrian Movement**

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1. Introduction

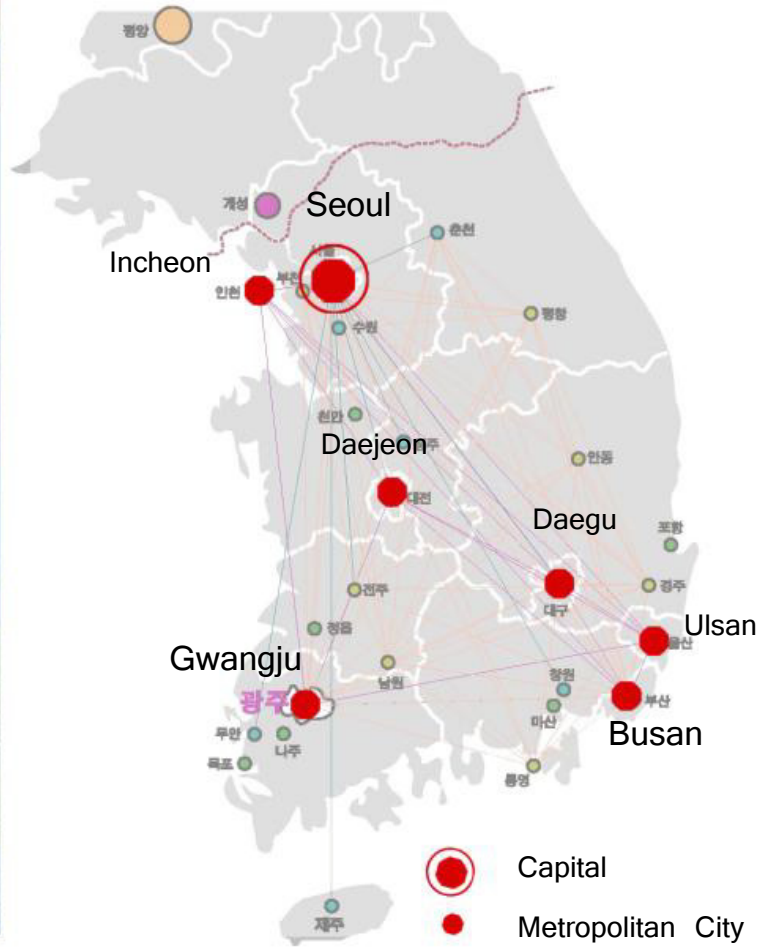
1.1 Background of research

Gwangju, like many other large cities, has witnessed the sprawl as the city has grown. The changes of industrial structure and the development policy focused on the new urban centers have resulted in the decline of the old city center in Gwangju. The city has initiated the urban regeneration plan since the provincial office was decided to move out of the city in 1998. The purpose of the urban regeneration project is to improve the economical and physical environment, as well as social revitalization of the old urban center. Urban tourism is one of the main issues related to redevelopment and regeneration. It is to pursuit economical development and environmental maintenance of the old urban center.

1. Introduction

1.1 Background of research

The city of Gwangju is building the Asian Cultural Complex (ACC) in an old urban center on the site where the provincial office had been situated until 2005. Through fostering the cultural activities and urban tourism the Asian Cultural Complex (ACC) is to revive the old urban center, which has been for a long time the commercial and administrative center in Gwangju. In line with the development of a large-scale cultural institution in the old city center, it is necessary to predict the changes in physical urban structure around the ACC and its consequence in pedestrian movements in the old town of Gwangju. Accordingly, the routes connecting the tourists' attractions in the old downtown of Gwangju around the ACC seem to be an appropriate next step to be discussed. The tourist routes are to stimulate the tourists to visit those attractions in the old city center and to help them understand and appreciate the distinctive features and the beauty of urban structure of the area.





1. Introduction

1.2 Purpose of research

This study has the following purposes;

First, to understand the spatial structure of the old urban center in Gwangju and predict the changes in urban structure after the ACC will begin operated.

Second, to understand how tour routes can be figured out in terms of attractions' characteristics and urban structure.

Third, to understand how tour routes and urban spatial structure can be related and how the relations can affect the urban tourism and the improvement of urban travelling.

1. Introduction

1.3 Research methods

First, tourist attractions around the old city center were examined, including the future ACC, in order to categorize in terms of their locations and characteristics as references for making tour routes.

Second, tour routes were established according to the themes of attraction.

Third, a space syntactic model was produced utilizing the Space Syntax tool, Depthmap. Using this model, the spatial structure of the old urban center was analyzed.

Fourth, the tour routes suggested in this paper were analyzed and compared in relation to the urban structure. The relations between tourist routes and the urban structure were figured out in terms of their syntactic properties and the relations to the street structure in the old city center.

And finally implications of the findings were discussed.

2. Urban Tourism and Spatial Structure

2.1 Urban tourism and urban regeneration

1) Urban tourism

Urban Tourism means “to make various sightseeing and leisure activities and to earn benefits from those activities. Residents or visitors can be the customers to enjoy existing city-scape, functional phenomena and image”. In addition, it refers to “sightseeing in the city based on attractions, amenities and city image.

2. Urban Tourism and Spatial Structure

2.1 Urban tourism and urban regeneration

2) Urban regeneration

Previously city maintenance projects such as urban reconstruction in the 1950's and urban renovation in the 1970's and 80's had purposes of economical vitalizations and physical environment improvement. However, when the purposes and the effectiveness of these projects had met the limitation, the concept of urban regeneration was introduced. Generally, urban regeneration refers to all the measures to heal physical, social and economical problems in which a city, or part of it is experiencing. Urban regeneration usually includes the terms such as urban redevelopment, urban vitalizations and urban reform.

2. Urban Tourism and Spatial Structure

2.1 Urban tourism and urban regeneration

3) Meaning of vitalization in urban tourism

These days, urban tourism becomes a big business in the city economy because it attracts more people into the city whose expenses can give the city an economic boost. In addition, the efforts for urban tourism usually include urban reform and the expansion of green space, which could eventually lead the environment regeneration in the city. From this perspective, urban tourism is strongly related to urban regeneration in regards to urban economy and environmental regeneration.

2. Urban Tourism and Spatial Structure

2.1 Urban tourism and urban regeneration

4) Types of urban tourism

Seven people-drawing elements by Law (1993):

historical memorials, museum/gallery, theater/concert hall, night entertainment activities, café/restaurant, shopping facilities, and office

Thematic categories in this research :

historic/cultural, shopping, cityscape tourism

With this categorization, the paper later presents tour routes according to their major purpose and activity.

2. Urban Tourism and Spatial Structure

2.2 Urban spatial structure and tourist route

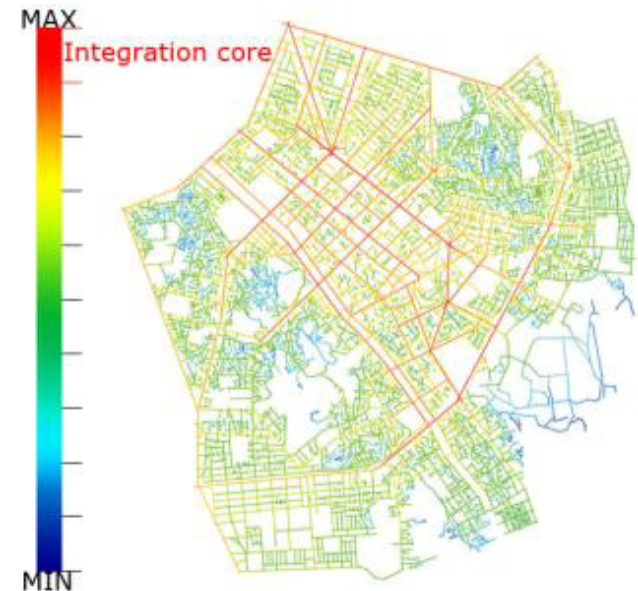
1) Space Syntax Theory

The spatial analysis framework that this paper adopted is based on the space syntax theory and its analytical methods developed by Bill Hillier and Jullian Hanson. The space syntax theory is used to figure out the urban spatial properties by means of quantitative methods of physical spatial relationship represented through nodes and edges on the layout patterns of streets. The syntactic analyses have shown that pedestrian accessibility is related to urban spatial structure. This can be interpreted as an index to show how easily people can comprehend the structure of a region or a city.

2. Urban Tourism and Spatial Structure

2.2 *Urban spatial structure and tourist route*

2) Space syntax indexes used in this research



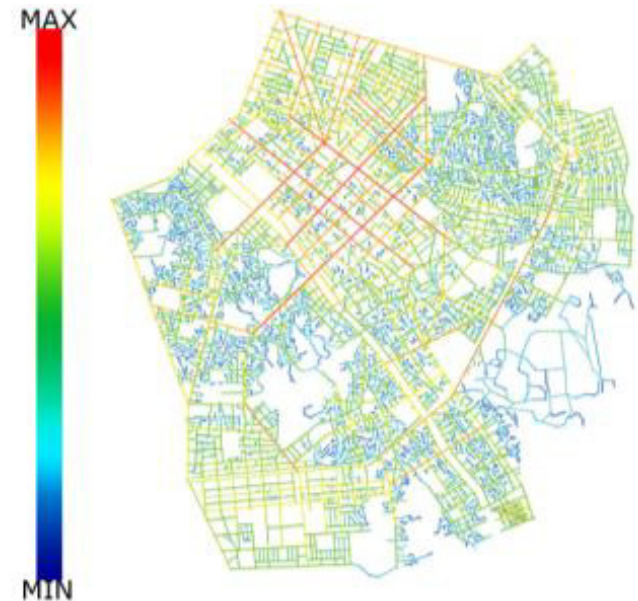
(1) Global integration

The global integration refers to the general accessibility and connectedness of each and every space in the whole spatial system. The higher integration value a space has, the more accessible it is from other spaces. It generally means that a space with high integration value has a good chance to become a place for gatherings and interaction between people.

2. Urban Tourism and Spatial Structure

2.2 Urban spatial structure and tourist route

2) Space syntax indexes used in this research



(2) Local integration

The local integration represents an accessibility and connectedness within a part of the whole spatial system. This value is calculated only several steps from a certain space, usually within three in depth. Previous researches indicate that the local integration can be interpreted by the hierarchy of accessibility and local movement of pedestrians.

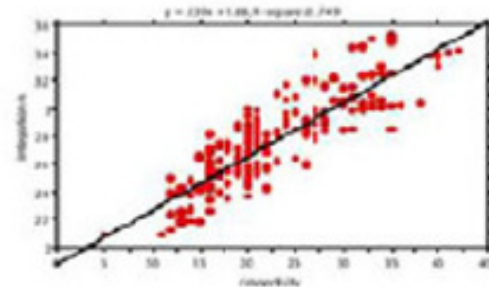
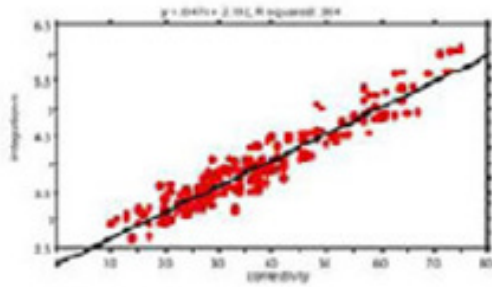
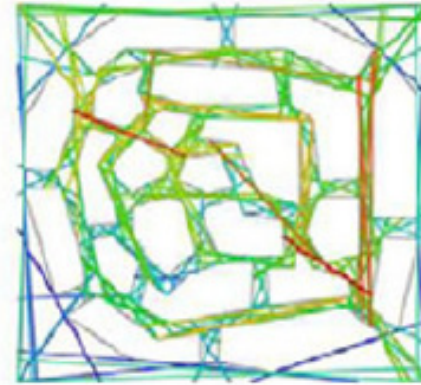
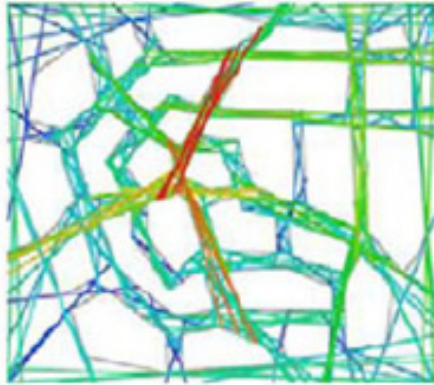
2. Urban Tourism and Spatial Structure

2.2 Urban spatial structure and tourist route

2) Space syntax indexes used in this research

(3) Intelligibility

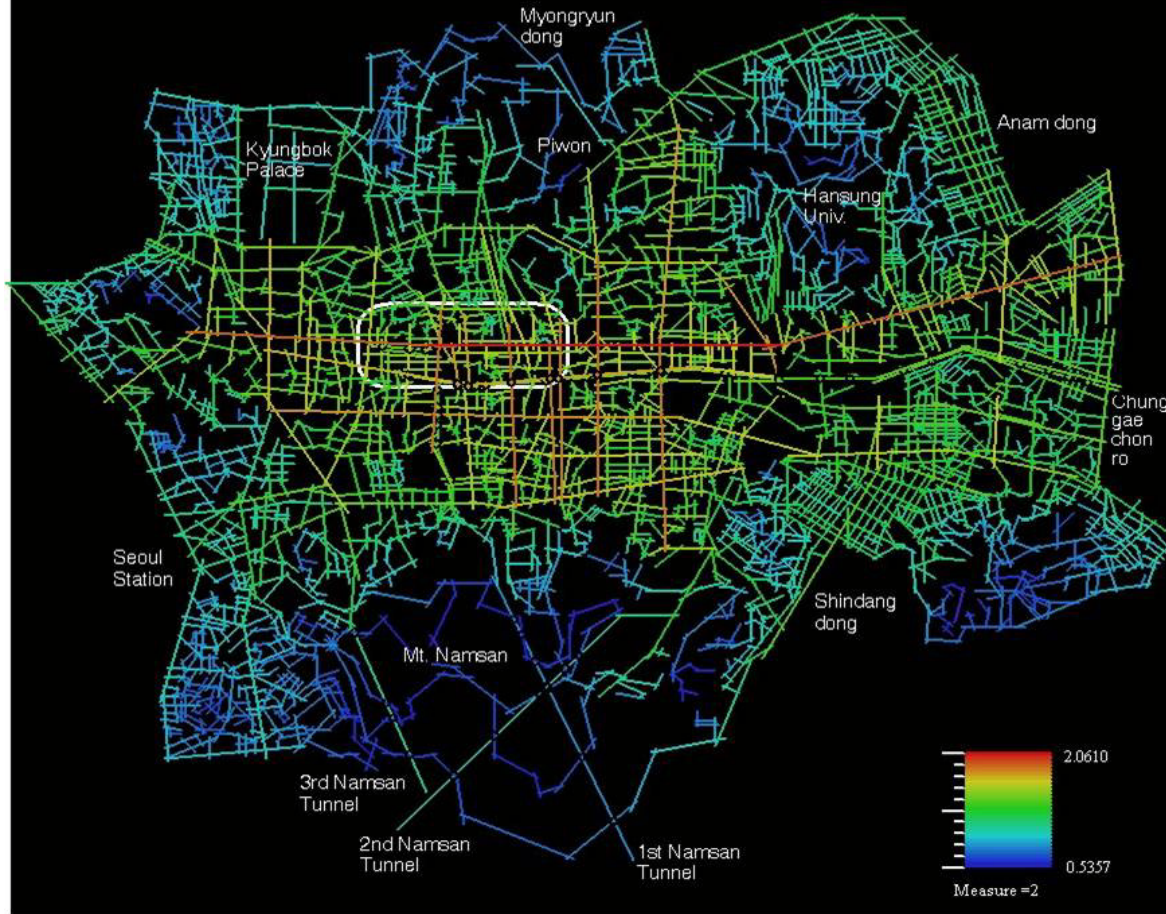
The intelligibility represents the interrelationship between integration/connectivity. It shows greater clarity or easier understanding of spatial layout patterns if the correlation is high. This index is usually presented in a scattergram with regression lines showing the correlation between local and global integration values. The spatial structure clarity is interpreted high when the regression line is over 45° and the dispersion is dense.



Non-discursive regularities

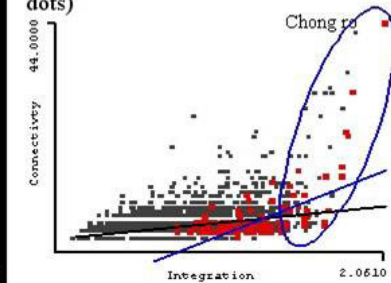
Space is the machine | Bill Hillier

North Seoul (old city centre) Global Integration



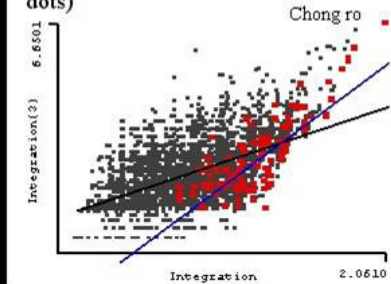
Intelligibility

showing two different grid structure of Central Seoul (encircled area in the left axial map); super block grid structure (dots encircled in the below scattergram) and deformed grid structure within it (other red dots)



Good Local Area Affect

representing the relationship between the selected local area (encircled area in the left map; red dots in the below scattergram) and the global urban system (grey dots)



2. Urban Tourism and Spatial Structure

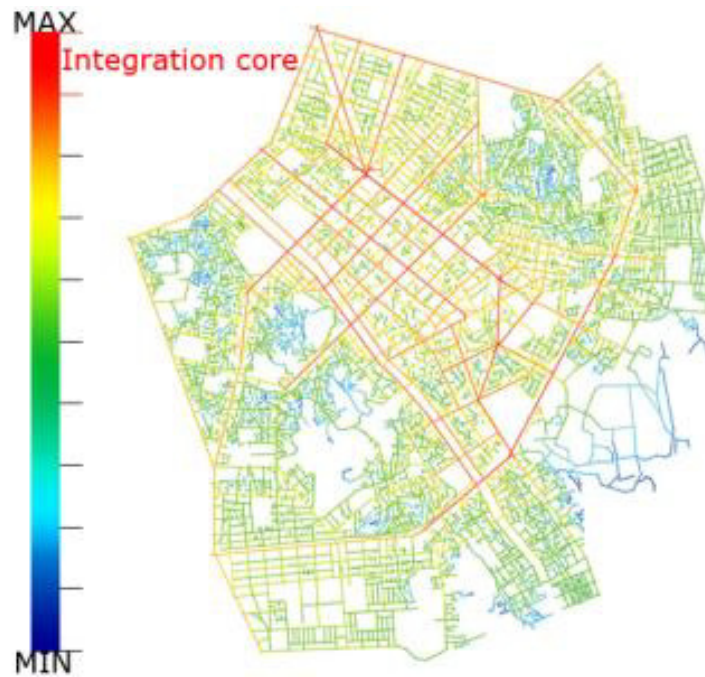
2.2 Urban spatial structure and tourist route

2) Space syntax indexes used in this research

(4) Integration core

The integration core is a subset of axial lines or spaces with higher integration values, usually the highest of 5%, 10%, or 20% depending on the characteristics of spatial system and the purpose of research in both global and local syntactic system. This core becomes the most accessible region in a building or a city to which people can easily reached even though they are not familiar with the circulation system.

Global Integration



Integration Core : 10%



2. Urban Tourism and Spatial Structure

2.2 Urban spatial structure and tourist route

2) Space syntax indexes used in this research

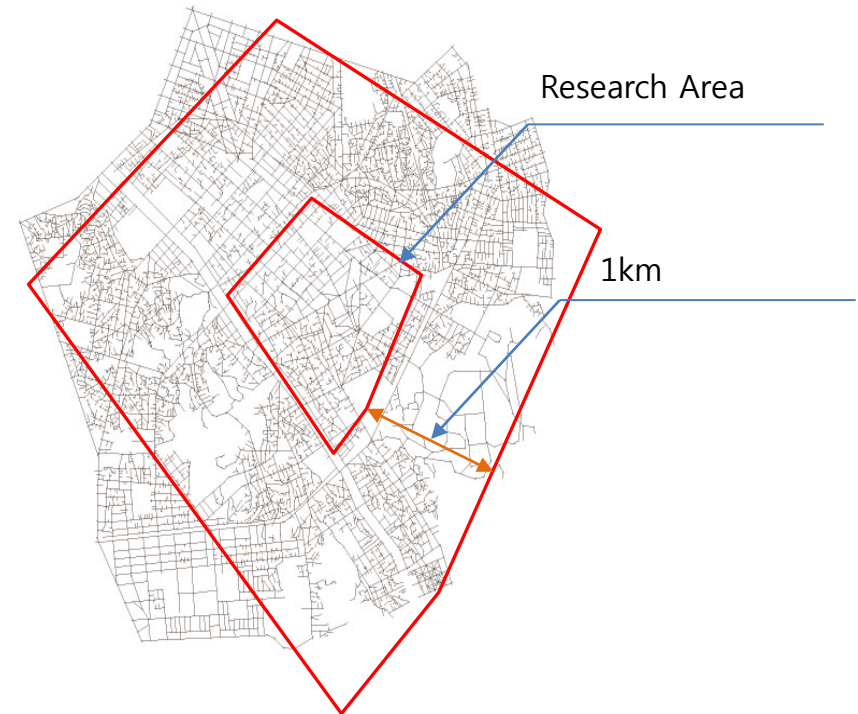
(5) Embeddedness

The embeddedness is an index to show how much a local spatial system is overlapped with the global integration core. In other words, this is the degree of overlap between a local system and the global system. It can be obtained through the percentage of how many axial lines in the local system are found in the integration core in the global system. If the value is high, the local system is strongly embedded to, or related to the global one,

2. Urban Tourism and Spatial Structure

2.2 Urban spatial structure and tourist route

3) Radius for analysis



The syntactic model in this study includes the surrounding area within one kilometer in radius to analyze the target area. This is to get rid of the edge effect which may cause unexpected results while analyzing only the target area

2. Urban Tourism and Spatial Structure

2.2 Urban spatial structure and tourist route

4) Method to create routes for urban tourism

Basic Considerations

First, the routes should be created in a systemic and holistic way. This allows tourists to get access to the various attractions in a city while they are following the routes.

Second, the routes should be created for pedestrians. By walking, tourists should be able to access the attractions sequentially. At the same time they should be relaxed and entertained.

Third, there should be a clear and local identity and an image that tourists can experience. For this, the categories of attractions identified earlier is applied. The distinctive and unique city image is the main strategy to draw more tourists.

2. Urban Tourism and Spatial Structure

2.2 Urban spatial structure and tourist route

4) Method to create routes for urban tourism

Procedure to create tourist routes

First, based on the investigation of attractions in the target area, the tourist attractions were listed and categorized by the themes.

Second, tourist routes were carefully configured based on the spatial structure analysis through Space Syntax. This provided easy orientation and accessibility for tourists to visit various places. In addition, this can give the design of each route a thematic identity through grouping of attractions in each route according to their thematic categories.

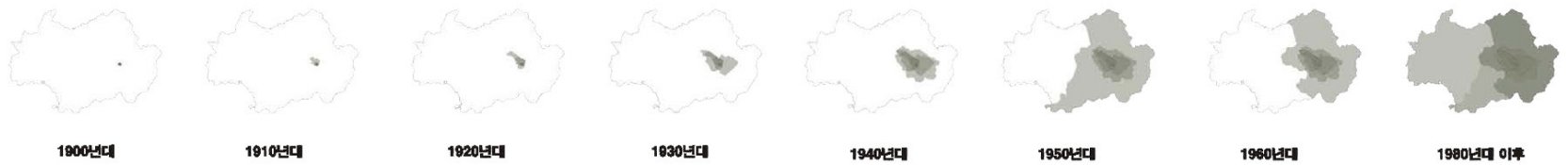
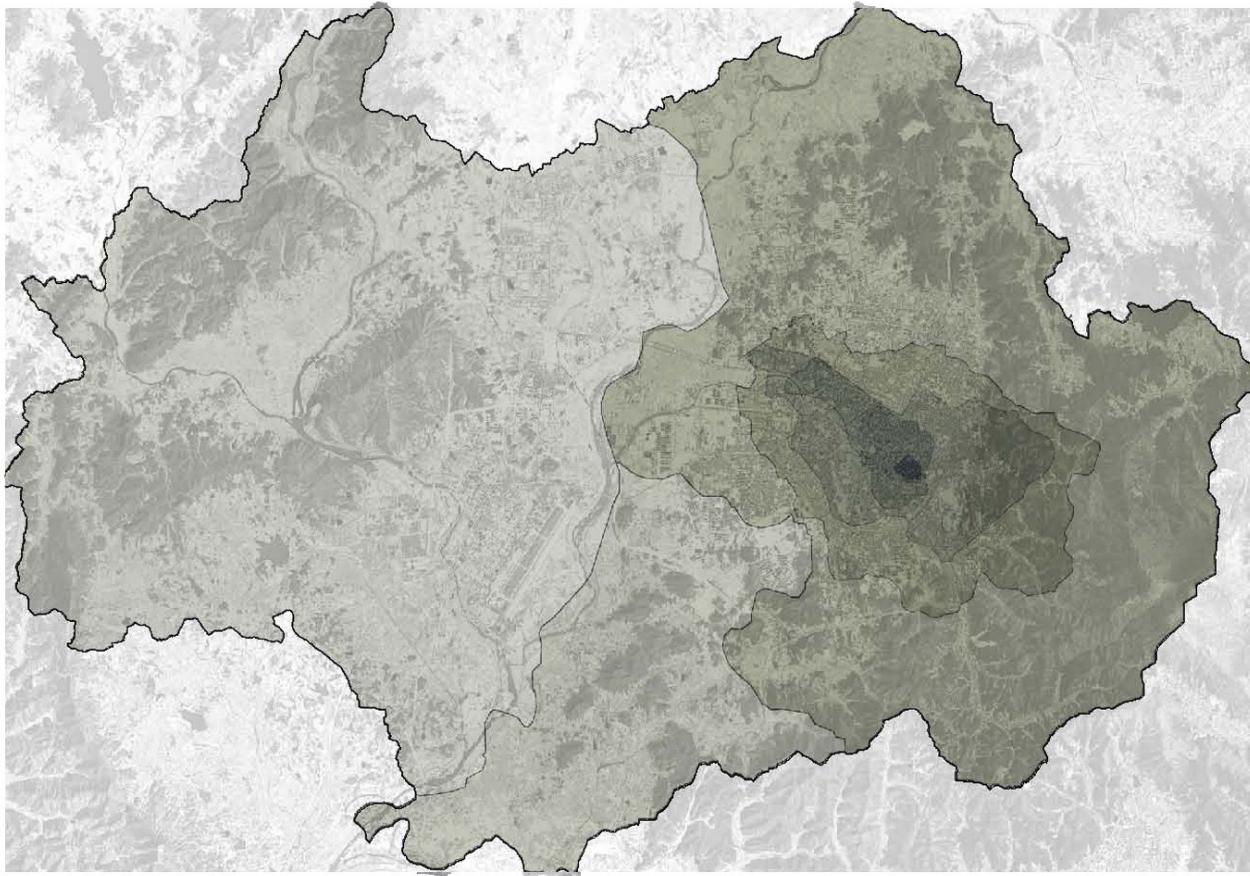
Third, thematic tour routes were evaluated and analyzed in terms of their own syntactic characteristics and its relation to the urban spatial structure.

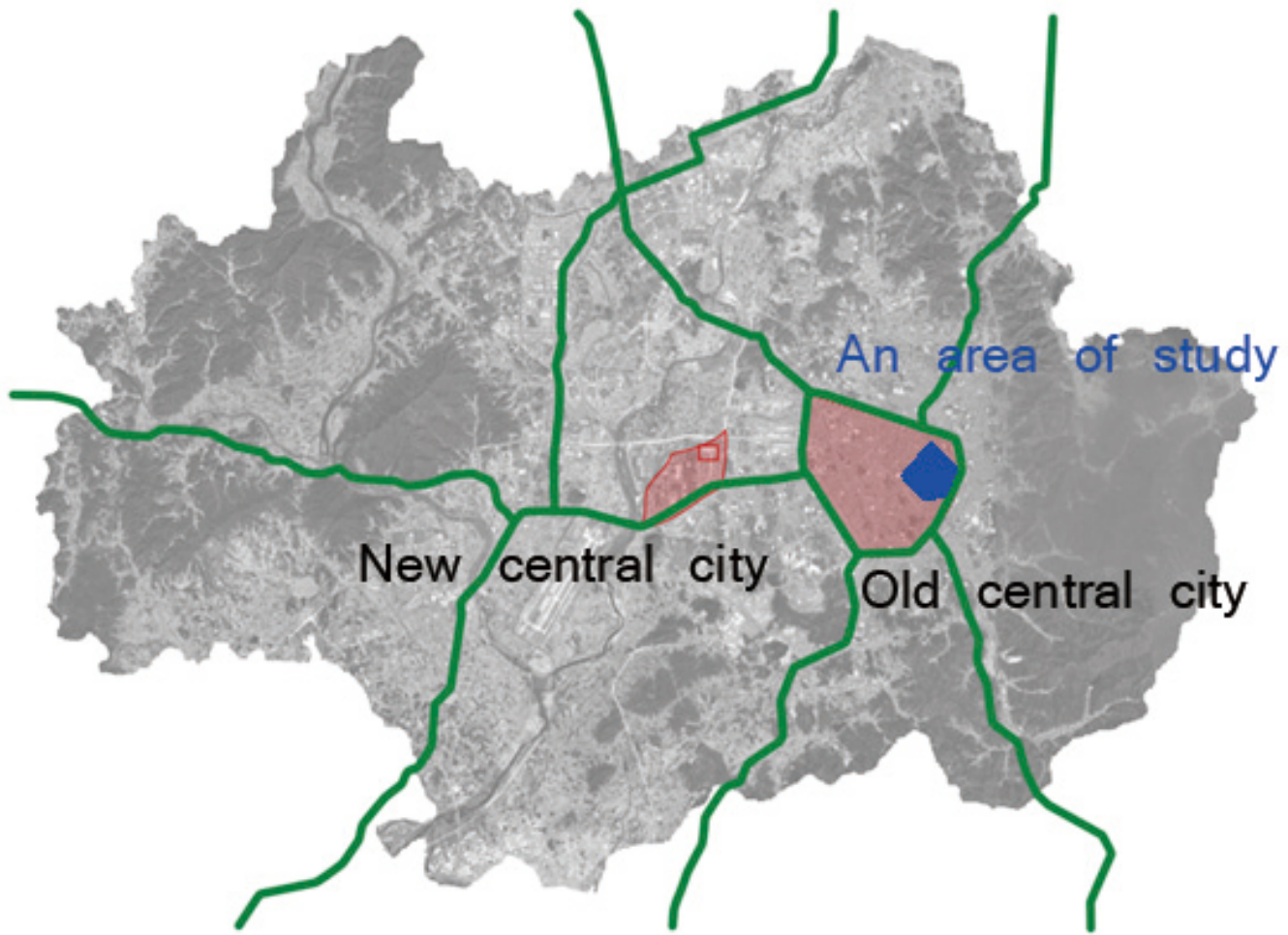
3. Spatial structure of Gwangju and tourist routes

3.1 Research area

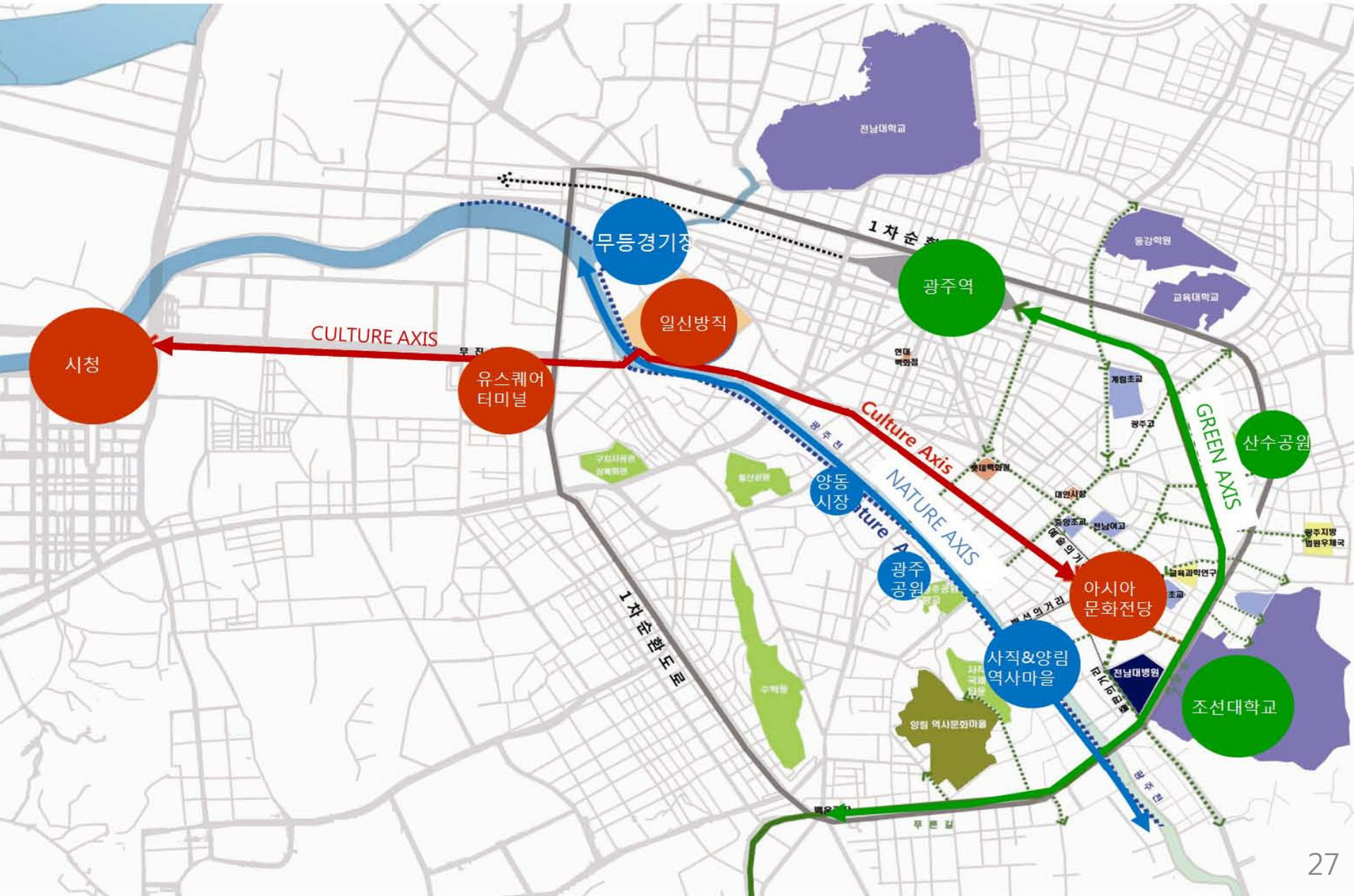
The research area is the old urban center of Gwangju, which is now located in the eastern part of the city. Its configuration had been shaped by the old city castle which was destroyed to build streets in the early twentieth century. At the eastern tip of the old city center, there is the site for the ACC, where originally the provincial office had been situated until it moved out of the city in 2005. The main land use of the old center currently is commercial and residential. Retail shops, private academies, lodges and inns, and community facilities are mixed into the area along the main street, Choojangro.

Growth of Gwangju

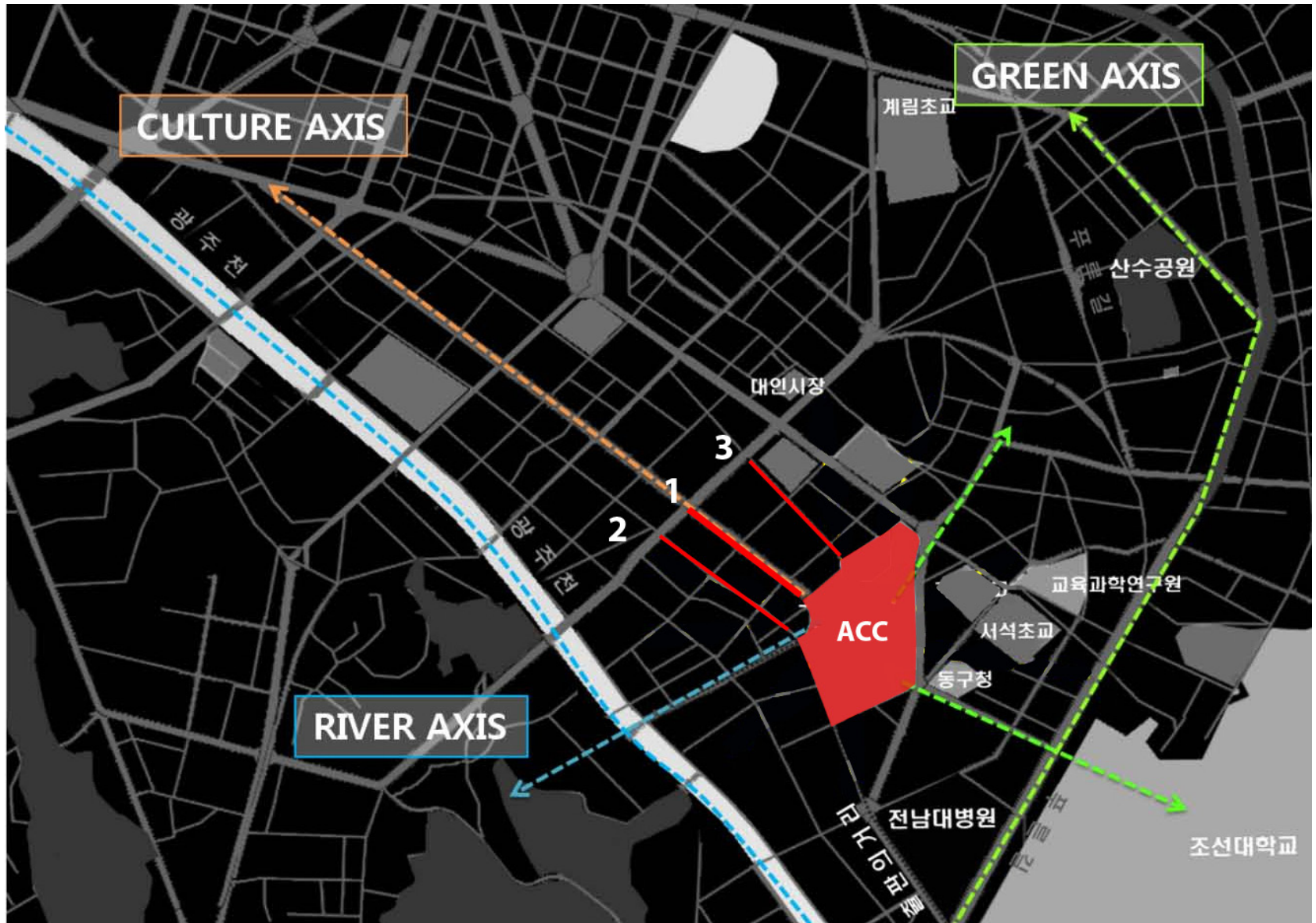




Conceptual Plan of Urban Regeneration



ACC and Urban Regeneration



Three Major Streets in Gwangju

2. Chungjang-Ro : Commercial



1. Geumnam-Ro



3. Street of Arts : Art



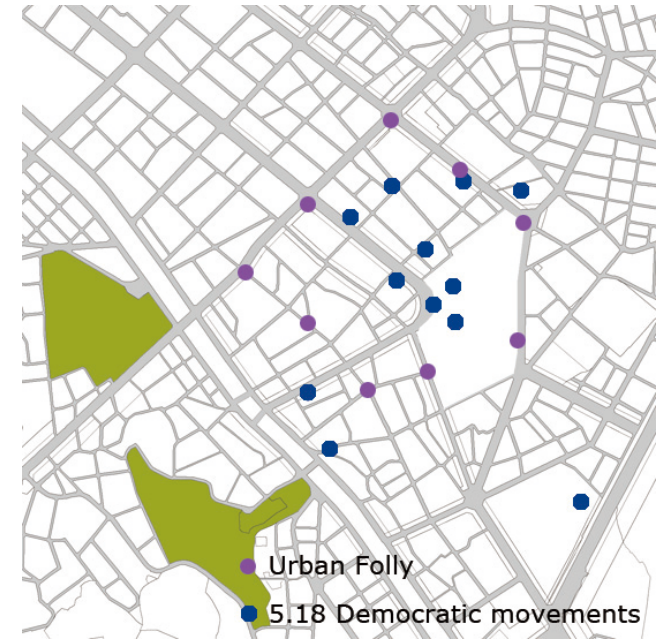
3. Spatial structure of Gwangju and tourist routes

3.2 Tourist attractions in research area

In the old city center, the ACC and the Street of Arts poses as cultural resources. The May 18th Democratic Movement Memorial Sites and the site of Gwangju Castle as historic elements and the street of Choojangro and Daein Market as commercial elements also exist. In addition, the area has natural environments, such as the Gwangju river, the Gwangju Park and the Sajik Park.

3. Spatial structure of Gwangju and tourist routes

3.2 Tourist attractions in research area



1) Point elements

As point element, there are various spots scattered around in the old city center area where major events had taken place during the May 18th movement in 1980. There should be a concrete strategy to connect these places together. In addition, there are urban follies along with the former site of the city castle. These places all have their own historic significance, yet need to be assembled and organized as a tour route.

May 18th movement in 1980



May 18th movement in 1980



Sites



Ancient city center 1800'

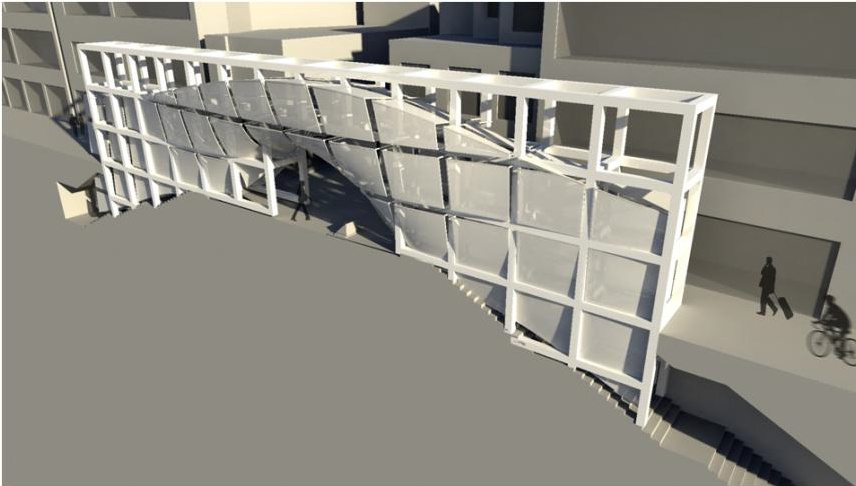


City area & ancient city center 2011



Sites & Trace of ancient city center

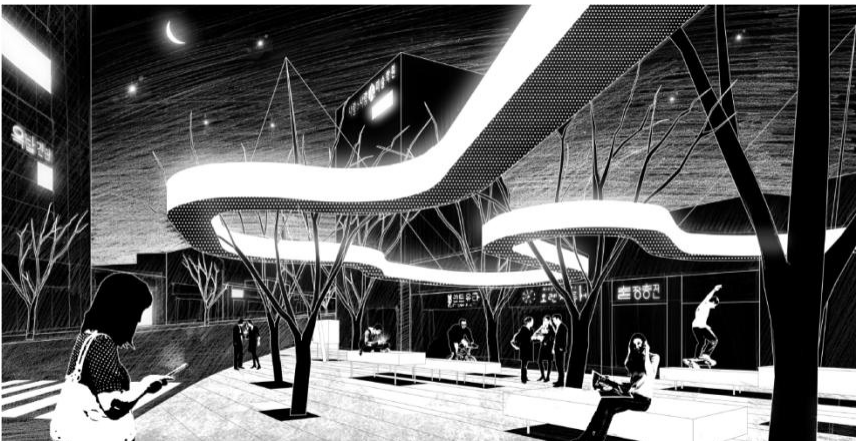
Peter Eisenman (USA)



Alejandro Zaero-Polo (Spain)



Juan Hereros (Spain)



Francisco Sanin (USA)



3. Spatial structure of Gwangju and tourist routes

3.2 Tourist attractions in research area

2) Line



One of linear elements in the old center is the Street of Art, which has a long history as one of the most prestigious places having an artistic aroma. According to our investigation, it is necessary to build a relation between the Street of Art and other main streets in the old center. Another linear element is the Gwangju River, which is an important environmental element as well. It is necessary to build relationships between the Gwangju river, the ACC and the Choojangro street. Also, there is potential to build an urban green linkage amongst the river, the Gwanju and the Sajik Park.

Gwangju river



3. Spatial structure of Gwangju and tourist routes

3.2 Tourist attractions in research area



3) Area

Area elements found in old center are composed of street districts and parks. The Choojangro Street district and the Daein Market are representatives of commercial areas in the old center area. Because of its location and length, the Choojangro is the most favorable candidate to connect nearby tourist attractions.

The Gwanju Park and the Sajik Park are the only two major natural green spaces in old center. Not only do they provide rest areas but they contain historic and cultural heritage, including early missionary dwellings and churches. These parks also need to be connected to the other tourist attractions.

3. Spatial structure of Gwangju and tourist routes

3.2 Tourist attractions in research area

4) Asia Culture Complex (ACC)

The ACC, another area element in the region, is a main facility that is expected to bring the actual turn-around changes in the old center with multiple cultural functions and tourist attractions. Since ACC is the focal project of the urban regeneration, ACC should be included in all the tour routes we suggest.

ACC Under Construction



Bird's eye view of ACC



Project Title	:	Asian Culture Complex
Site Area	:	96,036m ²
Building Footprint Area	:	21,314.84m ²
Gross Floor Area	:	143,837.75m ²
Region/District	:	Central Commercial District

3. Spatial structure of Gwangju and tourist routes

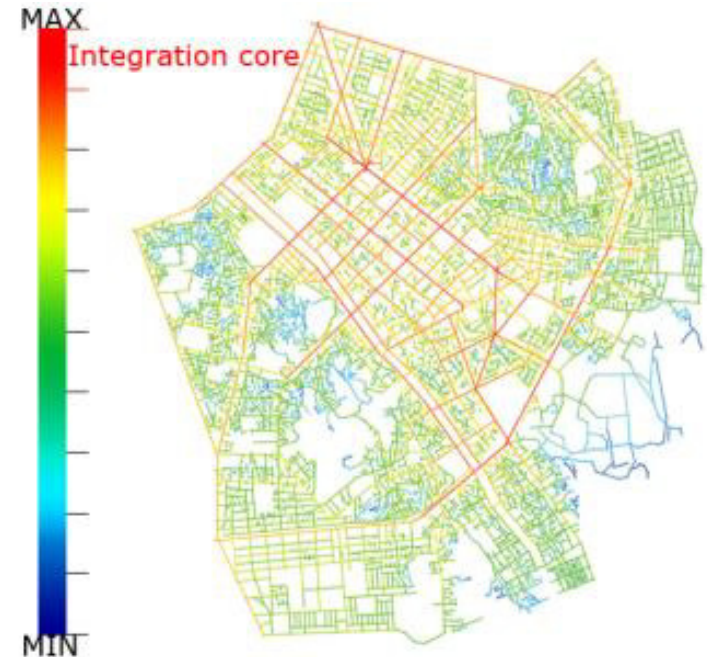
3.3 Spatial structure analysis in old urban center

This research utilized the space syntax analysis by the following syntactic measures to figure out the characteristics of spatial structure in the old urban center:

- (1) Global Integration
- (2) Local Intelligibility
- (3) Intelligibility

3. Spatial structure of Gwangju and tourist routes

3.3 Spatial structure analysis in old urban center



1) Global Integration Analysis

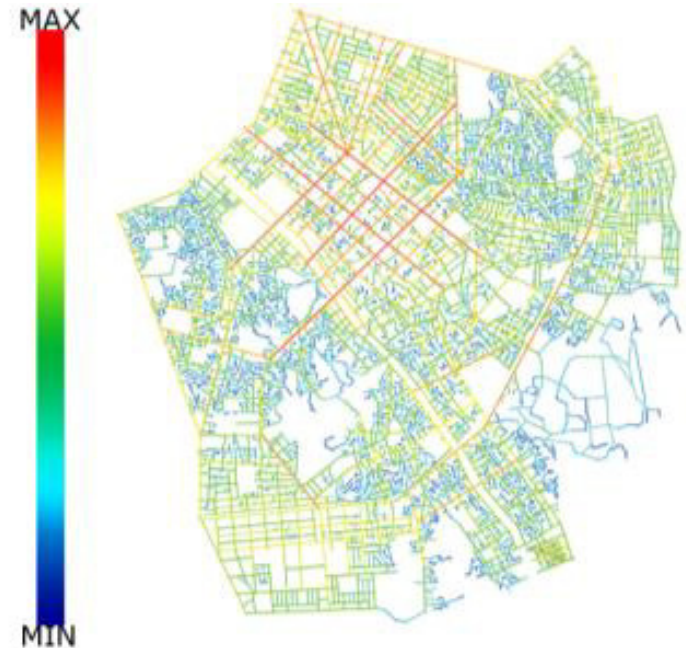
The most integrated area in the old center is the Choojangro street and the Keumnamro street and the secondary streets connected into these two streets. The inner loop or ring roads composed of several roads is also found to be the most integrated. The riverside streets and the streets connecting the Gwangju railway station to the city center are found integrated. Finally the streets around the new ACC are found highly integrated. Therefore tourists' facilities such as hotels, shops, entertainment are expected to be located on these streets.

3. Spatial structure of Gwangju and tourist routes

3.3 *Spatial structure analysis in old urban center*

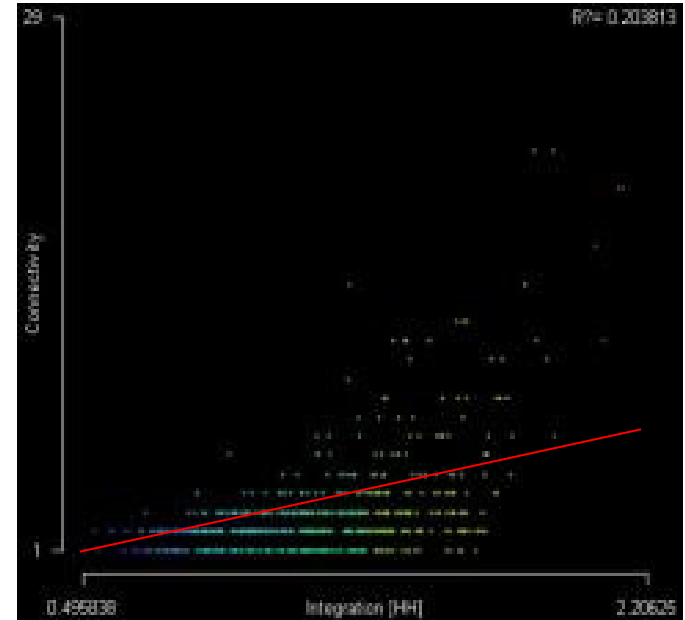
2) Local Integration Analysis

According to the analysis of local integration, the overall pattern in how the most locally integrated spaces are placed doesn't look much different from the global integration. Again the Choojangro and the Keumnamro and the Jooangro streets are found to be the most integrated along with several cross roads. Considering the accessibility into the old city center, the Keumnamro and the Jooangro are the best choices, but they can't connect the two parks across the river into the center. The Choojangro and the Street of Art are found to be easily connected to the Keumnamro and ACC.



3. Spatial structure of Gwangju and tourist routes

3.3 Spatial structure analysis in old urban center



3) Intelligibility

The intelligibility of the old city center has turned out to be quite low ($R^2 = 0.204$). Generally, this indicates that the urban spatial structure or the layout pattern of streets in the old city center region is not easily recognizable by the visitors. In fact, this bad clarity of spatial organization may cause way-finding problem to the visitors and can bring inconvenience to tourists and give a bad image. Therefore, it is necessary to provide easy routes for tourists for better understanding and easy experience of street organizations, eventually leading to a better city image.

3. Spatial structure of Gwangju and tourist routes

3.4 *Setting-up of Tourist routes*



1) Main tourist attractions

In order to establish tour routes to connect tourist attractions in the old center, the entrances or the starting points for tours are to be selected. Next, several actual routes are to be drawn up by the main themes which can be identified from the general characteristics and programs of attractions on each route.

3. Spatial structure of Gwangju and tourist routes

3.4 *Setting-up of Tourist routes*

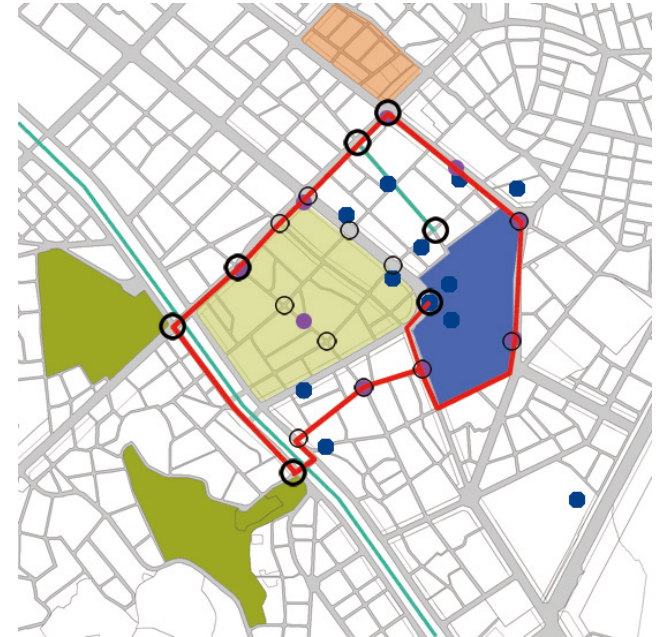


2) Setting-up Tour Routes

The tour routes can be classified by the circulation form and the program on the route; the loop and the network types in terms of circulation form, and the historical/cultural, the shopping and the city landscape types in terms of the program. Each route is setup by the order of integration value in order for the tourists to find the ways for accessing major attractions. The make-up of tour routes is also determined by how much the routes can be overlapped with the integration core of the old city center.

3. Spatial structure of Gwangju and tourist routes

3.4 *Setting-up of Tourist routes*



(1) Circulation type of tour routes

The loop type is formed by a path circulating all the attractions located along the route in either direction. Tourists are to follow the route in one direction to visit all attractions. Overlapping of tour routes can be minimal but there is a limit of freedom for tourists to choose ways and attractions as they wish.

City center circulation route



3. Spatial structure of Gwangju and tourist routes

3.4 Setting-up of Tourist routes

(2) Network type of tour routes

The network type is composed of several local loops and has multiple paths to travel from one spot to another, resulting in long circulation travels and more choices for the tourists to take. In this study, the network routes are to begin from the Asian Culture Complex, the most attractive spot for tourists, and to stretch out to several different routes according to each tour route designated by the main theme of attractions on it. The routes intersect each other to proceed to the next destination. There are various attraction possibilities for tourists to choose.

3. Spatial structure of Gwangju and tourist routes

3.4 Setting-up of Tourist routes

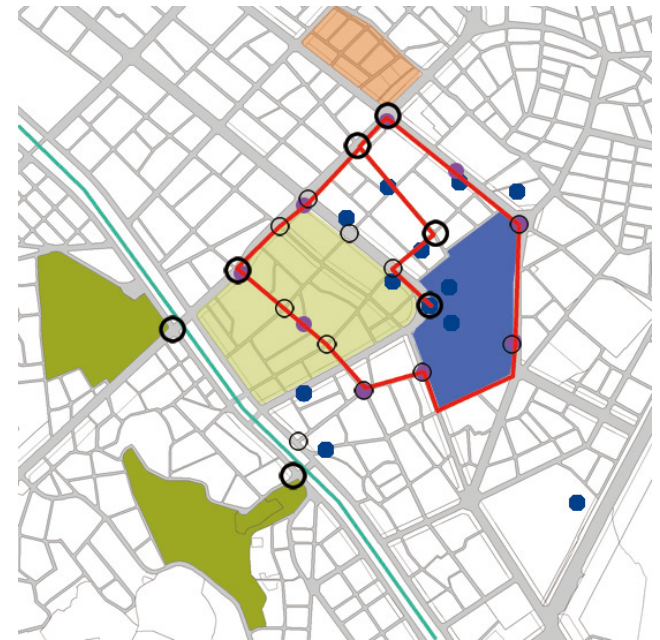
Network of alternative routes from the ACC

	1	2	3	4	5	6	Routes	
Asian Culture Complex	Street of Arts	Daein Market	Site of Gwangju City Castle	Choongjangro Street	Gwangju river	Gwangju Park Sajik Park	Historic/cultural route	
				Gwangju River	Gwangju Park Sajik Park			
		Site of Gwangju City Castle	Choongjangro Street	Gwangju River	Gwangju River	Gwangju Park Sajik Park		
					Daein Market			
					Gwangju Park Sajik Park			
	Choong-jangro Street	Site of Gwangju City Castle	Street of Arts	Daein Market			Shopping route	
			Daein Market	Street of Art				
	Site of Gwangju City Castle	Gwangju River	Street of Arst	Daein Market	Gwangju Park Sajik Park			
					Choongjangro Street	Gwangju river	Gwangju Park Sajik Park	
		Daein Market	Street of Art	Choongjangro Street	Gwangju River	Gwangju Park Sajik Park		
					Gwangju Park Sajik Park			
		Gwangju River	Gwangju Park Sajik Park					Cityscape route

3. Spatial structure of Gwangju and tourist routes

3.4 *Setting-up of Tourist routes*

2) Thematic types of tour routes



(1) Historic/cultural route

It is designed to travel mainly the historic and cultural assets in the old center. Since the historic and cultural attractions are dispersed all over the area, it is difficult to access them in a simple loop. Therefore it is necessary to design pedestrian route to connect all points in combined fashions of loop and network types.

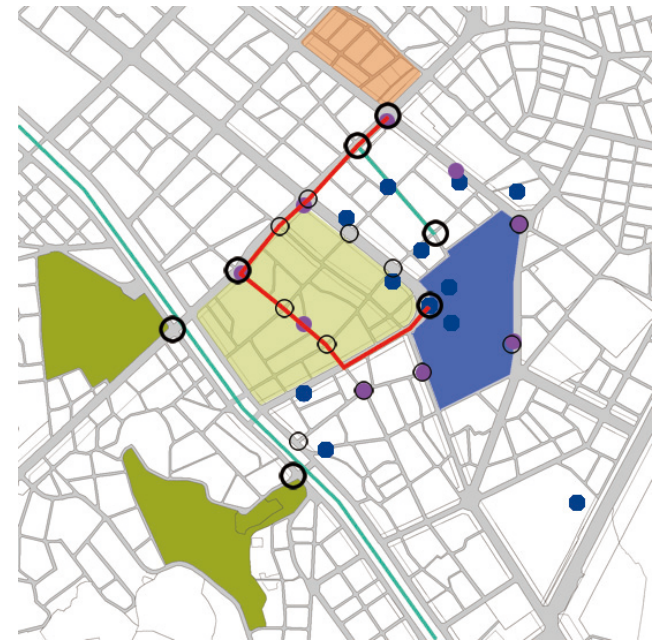
Historic/cultural route



3. Spatial structure of Gwangju and tourist routes

3.4 *Setting-up of Tourist routes*

2) Thematic types of tour routes



(2) Shopping route

The attractions along with the Choongjangro Street and inside of the Daein Market are mostly shopping. These points of interests can be grouped and form the shopping route in a linear path.

Shopping route



3. Spatial structure of Gwangju and tourist routes

3.4 *Setting-up of Tourist routes*

2) Thematic types of tour routes



(3) Cityscape route

Cityscape route is for tourists to recognize the characteristics of old city center as it basically follows the lines where the walls of the city castle used to exist. The route extends to the Gwangju Park and the Sajik Park which are located across the Gwangju River.

Cityscape route



3. Spatial structure of Gwangju and tourist routes

3.5 Comparison between tour routes

Result of syntax analysis of tour routes

	City center circulation route	Historic/cultural route	Shopping route	Cityscape route
Route type	Circulation	Network	Network	Network
Global Integration	1.53407	1.53976	1.52717	1.5758
Local Integration	3.3778	3.82364	3.73663	3.89588
Embeddedness	63.63%	54.54%	50%	100%

(1) Global Integration

In global integration, the cityscape route is found to have the highest value. It means that the cityscape route is most overlapped with the overall spatial structure of the old city center than any other routes in the study. The city center circulation route and the historic/cultural route have similar integration values. The lowest integration is found in the shopping route which can be interpreted that it is the least integrated with the major urban thoroughfares.

3. Spatial structure of Gwangju and tourist routes

3.5 Comparison between tour routes

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Local Integration	3.3778	3.82364	3.73663	3.89588
Embeddedness	63.63%	54.54%	50%	100%

(2) Local Integration

In local Integration, the cityscape route has the highest value as in the global integration. However, the city center circulation route has the lowest local integration value among the four tour routes. It can be explained that the route mainly follows the periphery of the old city center and it causes difficulties in accessibility from the integration core. Whereas the shopping route is found to have a relatively high local integration value compared with the lowest in global integration. This result shows that the shopping route, or the major commercial streets, is highly integrated at the local level and forms parts of the local integration core. It also is a shorter distance from the major urban corridors than the city center circulation route.

3. Spatial structure of Gwangju and tourist routes

3.5 Comparison between tour routes

Result of syntax analysis of tour routes

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Route type	Circulation	Network	Network	Network
Global Integration	1.53407	1.53976	1.52717	1.5758
Local Integration	3.3778	3.82364	3.73663	3.89588
Embeddedness	63.63%	54.54%	50%	100%

(3) Embeddedness

In regards to embeddedness, cityscape route is found to be overlapped 100% with the old city center's integration core. This implies that on this route, travelers can relatively easily recognize where they are in relation to the other part of the region and are able to find their ways without big trouble. Other routes show lower embeddedness value, which implies that they may need to be provided with information devices for routes.

4. Discussion and Conclusion

The study found the followings.

1. The old city center has a low level of clarity of spatial structure or intelligibility; area can cause some problems to the visitors recognizing the spatial structure and finding ways to their destination.
2. There are differences in syntactic properties between tour routes established by the themes of attractions; the syntactic property of tour routes seems to be related to the characteristics of attractions, or the themes of the routes.
3. It is necessary that complementary devices or additional attractions to improve the intelligibility and accessibility for the tourist routes and the old city center.

4. Discussion and Conclusion

And, for further study, the following issues shall be examined.

1. How can tour routes be more practical and distinctive in terms of exploring the whole old city center?
→ Tour routes could be developed based on the syntactic property of attractions rather than by thematic category. New tour routes could be developed in such way that more alternative paths or streets which were not involved in the presented four routes can be utilized and consequently combining or connecting parts of the presented ones.
2. How can the tour routes can contribute to stimulation urban tourism in old city center?
→ The way in which the syntactic properties of the routes impact the future land use and development in old city center should be investigated.