

Perceived Benefits and Problems Associated with Urban Trails by South Korean and U. S. Trail Users

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都市綠地 內 트레일 利用에 있어서의 便益과 問題點에 관한 한·미間 트레일 利用者 認識의 比較 研究

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ABSTRACT

Interest in the development of urban trails is growing in South Korea. River front trails have been developed in Seoul, Daegu and other major cities. Such trails, and the corridors in which they are developed, often provide a myriad of benefits to the community, including open space, exercise, and stress release. This trend mirrors development patterns found in the United States and European nations. This study examined differences in trail users perceptions of trail attributes, activity participation, willingness to pay for trail access, and perceptions of trail benefits between trail users in the United States and those in South Korea. Perceptions of trail users at three trail sites in the metropolitan area of Daegu were examined, and then were compared to results reported in several studies conducted in the U. S. While this research was exploratory, it did uncover many interesting differences in perceptions of trail attributes between trail users in the two countries. This information may provide insight into the development of greenway systems in South Korea.

Key words : trail attributes, greenways, urban trails, willingness to pay

要 約

최근 도시녹지 내 트레일 개발에 많은 관심과 그 중요성이 인식되고 있으며, 서울, 대구를 비롯한 주요도시에 이미 다양한 형태의 수변 산책로가 조성되었다. 이러한 트레일은 녹지공간의 제공, 건강증진, 스트레스 완화 등 지역사회에 여러 가지 편익을 제공하고 있다. 미국과 유럽국가의 경우, 도시녹지 내의 트레일은 체계적으로 조성되어 이미 일반화되어 있으며, 우리나라에서의 도시 내의 트레일 개발에 있어 중요한 기초 자료로서의 활용가치가 있다고 판단된다. 본 연구는 미국과 우리나라의 트레일 이용행태 특성, 참여 활동, 경제적 편익 및 이용 편익에 대한 인식 차이를 조사하였다. 대구광역시에 위치한 3개의 트레일과 미국 시카고, 인디애나폴리스 지역 등에 위치한 4개의 서로 다른 트레일에 대한 연구결과를 토대로 이용자에 대한 인식을 비교·분석하였다. 연구결과는 미국과 한국 트레일 이용자간에는 이용에 따른 인식의 차이점이 발견되었으며, 이러한 정보는 우리나라의 그린웨이 시스템 개발을 위한 유용한 자료로 활용될 것으로 사료된다.

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INTRODUCTION

Many countries look to the United States for leadership in the arena of parks and open space. The concept of national parks was born in the United States and with modifications has been adopted by nations around the globe. The trail and greenway movement may be the next park-related export from the United States.

Government officials in the city of Daegu, South Korea are interested in possibly implementing a greenway system. The primary motivations for exploring the adoption of a greenway system are to improve the health of city residents through the provision of facilities for walking, to enhance the existing park system, and to provide additional recreational facilities for tourists who attend international events that the city will be hosting in the near future. The activity of walking has been recognized for reducing the risk of heart disease, increasing bone density, and preventing obesity (Harvard Womens Health Watch, 1999). Currently the city has 18,000 acres of parkland in 90 different sites around the community, linking these sites would enhance the amount of open space and encourage the re-establishment of wildlife. Daegu will be hosting the Summer Universiade (2003), the International Textile Fair (2001) and the World Cup (2002) and has submitted a bid to host the World Exposition. Holding events of this magnitude provides opportunities to attract business and to obtain international exposure. Providing high quality recreational facilities will enhance tourists perceptions of the city.

The greenway concept arose in the United States when Frederick Law Olmstead proposed linking downtown Oakland, CA to the University of California at Berkeley campus via a tree lined boulevard in 1865 (Little, 1990). Then called a parkway, the concept has morphed from being an aesthetically pleasing roadway to linear corridors of open space which provide a myriad of benefits to plants, animals, and humans. The term greenway is

still a nebulous concept in that it is used to describe everything from a narrow right of way with a trail (Grove, 1994) to the 1,800 mile "Yellowstone to the Yukon" conservation initiative (Stewart, 1999). Broadly, the term greenway refers to a linear corridor of open space which connects two larger tracts of open space, often including a trail within the right of way.

Controversy often surrounds the development of new facilities, and pioneering greenway trails were not excluded from intense scrutiny. Two of the earliest studies which examined the potential benefits and problems associated with urban trail development were conducted in the San Francisco Bay Area (Adams & Holmes, 1978) and in Seattle (Seattle Engineering Department, 1987). Trail users and neighboring landowners were surveyed along the Lafayette/Moraga Trail and the Alameda Creek Trail, with a majority of landowners reporting that the trails were a good use of public funds, and that at least one family member used the trails (Adams & Holmes, 1978). The biggest problem identified by neighboring landowners was noise and dust from illegal motorbike use (reported by 30% of landowners along the Alameda Creek Trail).

Landowners along the Burke-Gilman Trail as well as real estate agents and police officers who work near the trail were interviewed to assess the impacts of the trail on property values and crime (Seattle Engineering Department, 1987). None of the respondents indicated that the trail should be closed and most felt that the trail improved the quality of life in the neighborhood. Property values were not negatively impacted due to trail development, and property close but not adjacent to the trail sells for a premium of up to 6% due to its proximity to the trail. Crime rates were found to be lower adjacent to the trail than in the surrounding neighborhoods. The results from both of these early studies indicate that trail development is a positive influence in an urbanized neighborhood.

The perceptions of trail users gathered through several more recent studies, conducted in urbanized

areas of the United States, were selected to use as comparisons with the perceptions of trail users in South Korea. All of the studies conducted in the United States were conducted prior to and independent of the research in South Korea. The Lafayette/Moraga Trail was one of three trails examined in a study of rail-to-trail conversions (Moore et al., 1992). This trail was selected for comparison because it was located in highly developed region and because the study included items regarding willingness to pay an annual fee to use trails. The Capital Area and McAlpine greenways are both located in urban regions in North Carolina, Raleigh and Charlotte respectively. Furuseth and Altman (1990) conducted a study along these greenways to document use patterns. A study of the five greenways in Indianapolis with existing trails was also conducted to document existing use and also to examine perceptions and preferences of users (Lindsey, 1998). Only results from the canal towpath were used for comparisons in this study because it was deemed to be the most similar to conditions in Daegu. Finally, comparisons were also made to data gathered by Gobster (1995) regarding local trail users in the Chicago metropolitan area.

The results from this exploratory study should be considered descriptive, and several limitations are identified. Some of the items used in the Daegu questionnaire were drafted to be comparable to the previous research conducted in the United States. It is difficult to draw direct comparisons between studies as the settings were different. Daegu is a very densely populated urban region, while the U. S. trails were located in suburban or less densely populated urban regions.

In spite of the limitations of this study, it was thought that comparisons between Korean and U. S. trail users might provide insights that would be helpful to trail managers in both countries. Trail managers in Daegu were interested in determining the appropriateness of developing greenways following the model used in the United States. Trail managers in the U. S. might be able to better under-

stand the trail use patterns of ethnic Koreans who have immigrated to cities in the United States. This study examined differences in the characteristics of trail users, methods used to access trails, activity participation, perceptions of trail benefits and trail problems, and willingness to pay for trail access between trail users in the United States and those in South Korea.

METHOD

As a first step in determining the feasibility of developing enways in Taegu a study of trail users, in three city parks, was conducted. A sample of 446 trail users at three sites (Apsan, Kachang, and Bummul/Bumae) were asked to describe their use patterns as well as their perceptions of the benefits and problems associated with trails through on-site interviews conducted during the months of July and August, 1999.

These responses were then compared to perceptions of users of similar trails in the United States. Since South Koreans are not familiar with the greenway concept, respondents were provided with pictures of greenway trails in the United States and a definition of the greenway concept, prior to being asked about their interest in developing similar greenways in Daegu.

RESULTS

Trail users in Daegu were predominately male (61%) while trail users in the United States tended to be more evenly split between genders (43-52% male).

Individuals aged 50 or older comprised 26% of the trail users in Daegu and tended to use trails more frequently than other age groups (Table 1). The proportion of trail users in the oldest age group tended to be smaller in the U. S. samples than in the Daegu sample.

The methods used to access trails varied greatly by location. Over half of the respondents used a

Table 1. Gender of Trail Users.

Gender of Users	Daegu (n=446)	L/M (n=776)	CAG (n=320)	MG (n=261)	IG (n=263)
Male	61.2%	43%	47%	52%	46%
Female	38.8%	57%	53%	48%	54%

L/M - Lafayette/Moraga Trail
 CAG - Capital Area Greenway
 MG - MacAlpine Greenway
 IG - Indianapolis Greenway

private vehicle to travel to the Daegu (53%) and Lafayette/Moraga (56%) trails (Table 2). In Indianapolis 38% reported using a private vehicle to travel to trails while in Chicago only 24% reported using a private vehicle for access. In Indianapolis most users (87%) walked to the trail at least some of the time.

Approximately one third of Daegu (33%) and Lafayette/Moraga (30%) respondents reported walking to the trail. Daegu trail users tended to use public transportation more than U. S. trail users (12% as compared to 1% or less). Bicycles were used for accessing trails by 24% of Indianapolis respondents, 13% of Lafayette/Moraga respondents, and 2% of Daegu respondents. Although bicycling is a popular activity for children in Daegu, there is little safe infrastructure established in the city for

Table 2. Mode of Transportation Used to Access Trails.

Transportation Mode	Daegu (n=446)	L/M (n=776)	IG ¹ (n=263)	Chicago (n=1193)
Private Vehicle	53%	56%	38%	24%
Walk	33%	30%	87%	76% ²
Public Trans./Other	11%	1%	0%	0%
Bike	2%	13%	24%	76% ²

L/M - Lafayette/Moraga Trail
 IG - Indianapolis Greenway

¹ Respondent could check more than one category of response

² Reported as walking and biking

adults to travel by bicycle. Children typically ride their bicycles in parking lots, school yards, or in private open space areas at the apartment complexes where they live.

Walking was the most common activity pursued on trails (Daegu, 78%; Lafayette/Moraga 63%; Capital Area Greenway 88%; McAlpine 88%; Indianapolis 45%), except in Chicago (35%) where bicycling was the most popular activity (64%).

Bicycling accounted for over one third of the users on the McAlpine (40%) and Capital Area (34%) trails, while one fifth of the Lafayette/Moraga respondents and 2% of Daegu respondents used bicycles (Table 3). Other activities pursued in Daegu include accessing sport facilities (15%), collecting spring water (13%), and taking green showers (8%). A green shower is a revitalizing walk through the woods to relieve stress and to get fresh air (Korea Forest Service, 1999). Other activities pursued along the McAlpine and Capital Area Greenway include picnicking, fishing, and transportation.

Table 3. Activity Participation.

Activity	Daegu (n=446)	L/M (n=776)	CAG ¹ (n=320)	MG ¹ (n=261)	IG (n=261)	Chicago (n=1193)
Walk	78%	63%	88%	88%	45%	35%
Run/Jog	14%	12%	39%	54%	39%	
Bike	2%	20%	34%	40%	16%	64%
Nature Study	27%		32%	28%		
Spring Water	13%					
Other	32%	4%	35%	37%		

L/M - Lafayette/Moraga Trail
 CAG - Capital Area Greenway
 MG - MacAlpine Greenway
 IG - Indianapolis Greenway

¹ Respondents could check more than one category of response

Trail users in Daegu and Lafayette/Moraga were asked to indicate how important they felt the trail was in providing several potential benefits. The rank order of responses was very similar between

the two groups, with health and fitness and open space preservation being the two most important benefits (Table 4). The provision of trail access to disabled persons was ranked last by Daegu respondents, while tourism and business development was ranked last by Lafayette/Moraga respondents. The legislation requiring access for disabled persons in South Korea does not apply to the provision of trails.

Table 4. Trail Benefits.

Benefit*	Daegu (n=446)	L/M (n=776)
Open Space Preservation	6.1	6.3
Health & Fitness	6.1	6.5
Beauty	5.7	6.2
Public Recreation	5.4	5.8
Community Pride	5.1	5.9
Public Nature Education	5.0	4.5
Tourism/Business Development	4.3	2.5
Disabled Access	4.2	5.5

L/M - Lafayette/Moraga Trail

* All items measured on a seven point scale from 1 = "Not at all Important" to 7 = "Extremely Important"

Trail users were also asked to identify the extent to which fifteen issues were problems at their site. In Daegu, lack of interpretive information was the biggest problem followed by lack of drinking water, poor trail marking/signs, and not enough information (Table 5). No comparisons can be made regarding lack of interpretive information because the question was not asked in the U. S. surveys. Lack of drinking water, lack of restrooms, and poor trail conditions were reported as the most pressing problems in the U. S. Generally the U. S. respondents indicated lower mean scores for all potential problems than did users in Daegu.

Willingness to pay (WTP) for access to trails was assessed in both the Daegu and the Lafayette/Moraga surveys. WTP is an estimate of the value users place on trails. A hypothetical scenario was developed which stated that trail use would be

Table 5. Trail Problems.

Problem	Daegu ¹ (n=446)	L/M ¹ (n=776)	Chicago ² (n=1193)
Lack of Interpretive Information	4.4		
Lack of drinking water	4.2	3.0	2.6
Poor trail marking/signs	3.9	1.7	2.0
Not enough information	3.9	1.5	
Lack of restrooms	3.7	2.8	2.7
Not enough parking	3.7	1.8	
Not enough access	3.3	1.4	
Dangerous road intersections	3.1	2.2	2.3
Rough trail surface	3.0	2.8	2.4
Litter/glass/trash	3.0	1.9	2.1
Poor trail maintenance	3.0		
Crowding	2.9	2.2	1.9
Narrow trail width	2.7	2.1	1.9
Fear of crime/personal safety	2.6	1.7	1.9
Conflict with other activities	2.3	1.8	1.8

L/M - Lafayette/Moraga Trail

IG - Indianapolis Greenway

¹ Measured on a seven point scale 1 = "Not a Problem" to 7 = "A Major Problem"

² Measured on a five point scale 1 = "Not a Problem" to 5 = "A Major Problem"

limited to only those individuals purchasing an annual pass. The cost of the annual pass was randomly assigned to each respondent. For the Lafayette/Moraga Trail approximately three fourths of the users were willing to pay \$1 annually for unlimited use (Table 6). Approximately half of the users were willing to pay \$6 or \$8, and one quarter to one third were willing to pay \$12 to \$30 annually. The highest value included in the survey was \$32, and only eight percent were willing to pay that amount. Over three fourths of the Daegu trail users were willing to pay up to 1,000 won (approximately \$.83) annually for unlimited use. The proportion willing to pay 2,000 won (\$1.70) decreased to just over half, but two thirds were willing to pay 5,000 won (\$4.20) or 10,000 won (\$8.40). The highest value included in the survey was 20,000

won (\$16.70), and over one third were willing to pay that amount.

Table 6. Willingness to Pay.

Amount Specified (Won)	Daegu		Amount Specified (US Dollar)	L/M	
	n	% yes		n	% yes
1,000	51	76	\$1	101	76
2,000	56	57	\$6	36	56
5,000	61	66	\$12	41	34
10,000	62	69	\$16	93	31
20,000	56	39	\$28	33	33

L/M - Lafayette/Moraga Trail

\$1 US = 1,200 won

DISCUSSION

The development of greenway facilities in Daegu similar to those found in many U. S. cities would be a challenge. Several communities in the U. S. have overcome obstacles such as developing safe trails and trail access points in urban areas with high traffic volumes. Often more challenging is attempting to link existing facilities together into a cohesive system. Establishing a network of trails in a community provides an environmentally sensitive way to meet increased demand for trail facilities while also enhancing the aesthetics of the community and serving transportation needs. Survey respondents in Daegu indicated that the creation of a greenway system should be a priority for the community (77%).

When making comparisons between the U. S. respondents and those in Daegu, the overall patterns regarding trail benefits were very similar. Only two of the eight potential benefits examined had higher reported means for Daegu trail users (tourism/business development and public nature education). The biggest difference was found regarding tourism/business development (4.3 Daegu vs. 2.5 U. S., on a 7 point scale with 1 being not at all important and 7 being extremely important). In Daegu, trail users tended to indicate that trails would be more

important to tourism and business development than did U. S. respondents.

Lack of drinking water and lack of restrooms were pervasive problems in both the U. S. and Daegu. Poor trail marking/signs and not enough information were not identified as problems by U. S. trail users, but were problems for users in Daegu.

Typically trails in South Korea are not well marked nor is information provided at trailheads. It is interesting to note that all potential problems were rated as being bigger problems for Daegu trail users than for U. S. trail users.

The methods used by residents to gain access to trails is very different in the two countries. Daegu residents are limited in their ability to walk or ride a bicycle to trailheads due to the distance from residences to trailheads, and due to the unsafe conditions for bicycles on roadways. Open space in the urban core of the community is extremely limited, so trails have been developed in isolated pockets rather than in connected corridors. Travel lanes for vehicles are narrower than in the U. S. and shoulders are not available for cyclists to use. Public transit was used to access trailheads in Daegu, but rarely used by individuals included in the U. S. studies.

As in the United States, it is uncommon to charge individuals to use trails on public land in Daegu. In an effort to determine the value of trails to users, respondents are commonly asked about their willingness to pay for trail access in a hypothetical situation. Without being able to make direct comparisons due to differences in values used in the questionnaires, it appears that a higher percentage of Korean trail users were willing to pay at each value included within the spectrum of both surveys.

CONCLUSION AND IMPLICATIONS

Trails are an inexpensive yet popular outdoor recreation facility which can provide a wide array of benefits to users and to the community. Participation in trail related pursuits is expected to continue to

grow in the United States and in South Korea. The number of U. S. citizens taking part in walking is expected to increase 21%, hiking 23%, and horse-back riding 23% by 2020 (Cordell et al., 1999). Walking for pleasure is the most popular form of exercise in South Korea and growth in this activity is expected to continue to expand (Lee & Oh, 1997). Linear corridors containing trails which link larger areas of open space are becoming more common in the U. S. The increased proportion of edge that this type of park provides as compared to a typical park allows the linear park to extend into the community. This corridor provides a means of access to the existing larger parks or open spaces as well as a means of traveling around the community. Additionally linear parks bring communities closer to meeting the Trails for all Americans recommendation of a trail within 15 minutes of everyones home (American Trails, 1990).

Should the City of Daegu decide to go forward with efforts to link Apsan, Kachang, & Bummul/Bumae natural areas via greenways, the application will most likely resemble Olmsteads plan for connecting natural areas in Buffalo, NY (Little, 1990). A broad avenue with wide sidewalks and large trees was designed as a slower paced alternative to the busy streets of Buffalo. Over time parkways became greenway corridors that focused on non-motorized modes of transportation to link parks, and then predominately natural corridors which may or may not provide any transportation component. The city of Daegu is almost completely built out therefore little vacant land or open space remains for greenway development within the urban core. In the United States trails have been retrofitted into urban and suburban environments through the use of abandoned railroad corridors, utility rights-of-way, canal towpaths, and channelized waterways. Few linear corridors such as these exist in Daegu. It would be extremely difficult and costly to reintroduce natural habitat to the urban environment. To link the few parks within the densely developed center of the city, connectors will have to be

creating using existing street alignments rather than attempting to emulate a system that is entirely within greenspace. Perhaps the Woonerf concept, which reclaims portions of the street right of way for non-vehicular uses (Odani & Yamanaka, 1997), could be combined with the greenway concept and adapted for use in Daegu.

Prior to moving forward with a greenway type of development, a sample of the entire population of Daegu should be surveyed to determine their attitudes towards the concept. Most (93.8%) of the trail users surveyed indicated that they would support greenway development in Daegu, but this may be a biased sample in that those surveyed were already trail users. Additionally the types of use that might occur in such a corridor should be assessed. Anticipated uses could be used to aide in the design of greenway trails for Daegu. Providing trail linkages into the community will allow trail users to be distributed over a larger area of land, but they will also encourage more people to access the existing trails in the natural areas. It will be important to make the greenway trails appealing enough that not all of the users will take the shortest route to the natural areas, but will prefer to stay within the greenway corridors. The existing trails should be refurbished, in an environmentally sensitive manner, to accommodate a larger number of users.

This study had a limitation that needed to be addressed. Several studies conducted in the U. S. did not have identical data format with the Daegu study. The results between the U. S. study and the Daegu study were compared with descriptive manner, so it did uncover statistical differences in perceptions of trail attribute between trail users in the two countries.

This study was a first step in beginning to explore whether development of greenway trails would be appropriate in Korea, and to examine cultural differences between trail users in the United States and abroad. Future research should continue to explore cultural differences to determine if cultur-

al norms are more influential than accessibility of trails. For example the activity of in-line skating is perceived to be predominately a pursuit for adolescents in Korea, whereas many adults participate in in-line skating in the U. S. Will greenway trail development in South Korea stimulate adult participation in in-line skating or will cultural differences keep them from trying the activity? Another interesting issue for future research would be to assess the trail use patterns among recent immigrants to see if those patterns evolve and adapt to align more closely with those of the new country.

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