A STRATEGIC STUDY OF BICYCLE TOURISM IN TAIWAN

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Abstract: It appears that bicycle usage and associated tourism activities has become a popular travel mode together with the rising environmentalism and increasing awareness for sustainable development. This research is aimed to syntegrate the study of demand and supply of the bicycle tourism and through analyze different perspectives covering factors which include cycling tourist, tourism industry, bicycle supply and manufacturing, recreational environment, land use planning and tourism marketing to achieve the higher goal to call for a combination of green industry and green mode that is applicable to be applied across Taiwan. The research investigates the relationship between the development of bicycles and tourist industry and follows with a case study in Kwanshan Town of Taitung County where is a successful example. The case study examines its key successful elements from its social, environmental, industrial and political aspects, then suggests a model for the bicycle tourism development in other areas in Taiwan.

Key Words: Bicycle Tourism, Sustainable Development, Bicycle Lane, Bicycle Path

1.BACKGROUND

Since the 20th century, tourism and recreation has increasingly gained their importance in the hierarchical order for national development. Tourism has become one of the major sources of income for many cities and townships. The relationship between tourism and transportation development is inseparable that it affects local economy, nation-wide and international competitiveness in many countries.

Walking and cycling, the green modes, are ideal ways of traveling from the point of view of energy conservation, environmental friendly and social equality (Tolley, 1990). Tourism and recreation, the green industries, are ideal ways of development in terms of environmental impact and sustainable concerns. Therefore, under the "greening" issue, the research aims to integrate tourism and transportation and proposes the strategy of bicycle tourism in Taiwan.

It is said that da Vinci invented bicycle in 1493. However, the drawings are not available from date testing, and most historians regard them as fake (Ballantine, 2001). According to Southworth, due to the deterioration of the road system, bicycle became a new and popular mode of travel. The bicycle was invented in 1580 as it reached its peak of popularity in 1877. The new bicycle captured the public imagination by offering convenience and mobility that was both safe and cheap (Southworth, 1997).

The end of the 19th century, bicycle became a national craze as bicycle design improved (ITE, 1994). In the period between 1890 and 1895, it was referred as the "Bicycle Craze Era" when bicycle clubs in both England and the United States were urging the government for road improvements (Southworth, 1997). It is known that enthusiasm for the healthy outdoor life coincided with the invention of the bicycle, and cycling holidays, aided by promotion from the Cyclists' Touring Club which was founded in 1878 (Hollyway, 1989). Then the bicycle tourism started to emerge.

When the world entering 20th century, people faced a transportation revolution. New technology brought to us a faster, and more comfortable transportation. It changes our traveling modes, human behavior and demand including work, living, leisure, and land use. Morphological development of transportation from marine to railway transit and from air transportation to autobahn have profound influences on modes of travel, tourism activities, and changing land use pattern in Taiwan as well as globally.

In the early 1970s, the global oil crisis stimulated the bicycle revival and led to a positive growth. As a matter of fact, the popularity of cycling and walking has steadily increased since 1975, when the advent of the first fuel crisis saw the re-emergence of non-motorized modes of transportation. For example, the initiatives advanced in Denmark as a result of the oil crisis were widely accepted at almost all levels within professional and governmental circles (ITE, 1994).

2.STUDY PURPOSE

Although Taiwan has been recognized to be the kingdom of bicycle manufacturing whereby many Europeans are proud of having a bicycle that is Made In Taiwan because of its high quality in durability and innovative in design. However, the bicycle usage as a transport mode in Taiwan has always been an issue confronting local transportation and bicycle manufacturing industry. The low popularity rate of bicycle usage is evident in the rate of bicycle ownership in the affluent capital city, Taipei, where bicycle ownership reached 0.25 per household seriously pose variety inadequacy in the transit choices for work, leisure and living.

Nevertheless, it appears that bicycle usage and associated tourism activities has become a popular travel mode together with the rising environmentalism and increasing awareness for sustainable development.

Bicycle tourism can be defined as a positive activity, which includes both transportation and recreation experiences. Tourism and recreational cyclists are individuals who use a bicycle for trip enjoyment, and usually take relatively short trips at lower speeds. Bicycle for work or commute in England has redefined its role not only as a commuting tool but also as an important tourism transportation mode. European and North American countries are actively promoting bicycle tourism. The European Charter of Pedestrian's Rights adopted by the European Parliament in 1988:Vii (b) the provision of facilities for bicycles throughout the urban areas. England has benefited from its bicycle tourism that contributes to 5 billion pounds of tourism income and bringing an approximate 250 million bicycle tourists annually.

The bicycle boom restored the role of the bicycle as a tourism, recreation and sport modes. The rising demand for good bicycles made the start of new firms in the USA, Japan, and Taiwan (Ballantine, 2001). Before the late 1970s, Asian manufactures had already well undercut from price the old European and American manufacturers (Ballantine, 2001). Of all quality frames made, more than 50% came from Taiwanese Giant Company.

Many argue that the island's topography and climate constraints may be less conducive for bicycle commuter in Taiwan. Nonetheless, national trends emerged recently to include green mode planning that regards bicycle as an environmental desirable option for outdoor recreational and tourism transportation mode. In year 2002, the Sports Council launched the Planning and Establishment of Bikeway System in Taiwan. Such program is aimed to encourage the development of local green industry through elevating tourism and transportation development. Approximate 21 billions NT dollars have been invested on such development.

Regarding the first stage of investigation in this research, it is found that the evolution development of Taiwanese bicycle begins from the transport function to the demand of leisure and furthermore to the present combination with tourism development. The development trend can be divided into three major periods. Because of differential administrative and subsidizing organizations, the development objectives of national policy vary as well.

The development of bicycle lane in Taiwan is originated in Taipei and it's based on the purpose of transportation function. In 1991, there were one-metered bicycle lanes constructed on both sides of traffic island. It was on a testing operation stage but failed to conduct further because the cyclists still rode on pedestrian.

In the late 90s, the development plan of bicycle land between Danshui River and Hsintien Creek became the first bicycle lane with recreational functions in Taiwan. In 1997, bicycle lanes constructed around the Kwanshan Town became successful and it had promoted a wave of unrest overall Taiwanese towns and countryside where every county and city follows the development of bicycle lanes. At this stage, the Construction and Administration is acted as the sponsored organization in directing the development of bicycle lanes in every country and town together with the subsidy of "New Features for Cities and Counties Construction Plan".

At the same time, National Parks and National Scenic Areas also coordinated with the tourist and recreational development and started to construct bicycle lanes within the Parks. Since 2001, private amusement parks have provided bicycles for rent and relevant facilities for the users. The table below shows the development bicycle lanes in Taiwan.

Table 1: Bicycle lane development policy evolution in Taiwan

Purposes	Location	Sponsored Organization/ Sources of Subsidy	Location/Planning Characteristics	Note
Commute and Leisure	City center	Maintenance Office of Public Works Dept, Taipei City Government	1 meter for both sides of traffic island	The first trail lane was being constructed in Taipei in 1991.
Recreation	Danshui River Hsintein Creek	Park and Street Office, Public Works Dept, Taipei City Government	Riverside Area	First recreational use bike lane
Tourism and Recreation	KwanShan	Construction and Administration of Interior Ministry	New features of county and towns	First special lane was completed in 1997
Commute and Leisure	Tamshui MRT Line	Taipei Rapid Transit Corporation	Along the MRT line	Completed in 2000
Tourism and Recreation	National Parks	National Park Headquarters	National top grade	YangMing Mountain, Kenting etc
Tourism and Recreation	National Scenic Areas	National Scenic Area Administration	National top grade	Most are being planned
Sport and Recreation	Circum Island and locality	National Sports Council	Significant national sport construction	Initiated in 2002

Many cities and countries eager to construct bicycle routes to meet the increasing demand for recreation and tourism purpose. However, there is little research conducted in the field of bicycle tourism to consider the interrelationships of the demand for tourism-induced cyclists and the supply for tourism industry in Taiwan.

3. LITERATUER REVIEWS AND EXAMPLES OF BICYCLE TOURISM

3.1 Studies of Bicycle Tourism

Ritchie (1998) indicted the emerging trends of bicycle as an important leisure and recreational transportation mode. Little research has been conducted into cycling within a tourism context. Ritchie examined the increasing phenomenon of bicycle tourism, and recommends for future planning and management of bicycle tourism in New Zealand (Ritchie, 1998).

Lumsdon (2000) discussed the relationship between transportation and tourism; the former is not only a means but also a component of the tourism offering, especially at the destination. Lumsdon evaluated the concept of a planned sustainable transport network, the National Cycle Network in the UK, as a potential model for the integration of transportation, tourism and recreation (Lumsdon, 2000).

Mason& Leberman (2000) discussed that planning for recreation and tourism is not necessarily a straightforward process at bcal level. Local policy makers maybe unable to reflect the complexity of the planning process, particularly when it should consider a variety of views different stakeholder (Mason, 2000).

Cope et al (1998) described a research program carried out on a long distance cycle route in northern England during 1996-1997. Cope sought to profile users monitor the overall number of users, describe their spatial and temporal distribution and quantify their economic impacts. Cope also concerned the performance of the route in terms of the cycle tourism niche (Cope et al, 1998).

3.2 Studies of Bicycle Development

Jackson and Ruehr (1998) investigated the San Diego Association of Governments who allocates 2 million dollars annually on bicycling projects throughout San Diego County. Both the County and the City employ full time bicycle coordinators. The County Public Works Deportment was commissioned the County Bicycle Use and Attitude Survey. Overall, survey respondents expressed support for government efforts to promote bicycle transportation (Jackson et al, 1998).

Antonakos (1996) indicted that the current recommendations for designing bicycle facilities are most often based on experience rather than on findings from scientific inquiry. Antonakos examined the influence of personal characteristic, travel resources, and travel constrains on cyclists' environmental preferences, evaluations of cycling conditions, and decisions to bicycle for transportation (Antonakos, 1996).

Nelson and Allen (1997) argued that conventio nal wisdom suggests that if bicycle pathways are provided, people will use them. Nelson and Allen used cross-sectional studies of the association between supply and commuting (Nelson et al, 1997).

3.3 Examples of Bicycle Tourism Development

The City of Windsor in Canada has been developing a cycling and recreation network since 1991 with the adoption of the Bicycle Use Development Study (BUDS). The completion of a comprehensive cycling network is viewed as integral to Windsor's vision for a balanced transportation system. In year 2000, the City furthermore completed the Bicycle Use Master Plan (BUMP), its purpose is to guide the development of a comprehensive cycling network that will make it the preeminent city for cycling in North America.

In year 2002, Adirondack North County in America completed Bicycle Master Plan. Its purpose is to develop a regional bicycle plan that clearly demonstrates the community benefits and economic value of local bicycle planning efforts, and outlines the next steps necessary for creating bicycle friendly communities and for promoting the region's reputation as a bicycle tourism destination.

4.METHODOLOGY AND DATA COLLECTION

This research studies Kwanshan Town in Taitung County and analyses its successful factors. Kwanshan Town is located on the east Taiwan and is a major transport node along the east coast line. It was famous for its sunset scenery in the early period. 120,000 residents who many live on the agriculture, which produces its famous Kwanshan rice, populate the whole town. Under the local chief officer's effort and the subsidy from the central government, Kwanshan Town in 1997 constructed the first bicycle lane with 12 km in length that provides a safe biking environment. Following its completion of bicycle lane and coordination with many private proprietors (including travel agencies and bike shops, etc.), the first bicycle tourism in Taiwan was developed in 2000. Nowadays, there are approximately one million people visiting this place and it has created a tourist value of 2 billion dollars. The government with approximately 3 billion dollars successfully invests the achievement of this construction. The development of bicycle lanes in Kwanshan Town is depicted below.

Table 2. The development of bicycle tourism in Kwanshan

Development Goals and Indications		Bicycle circulation lanes in Kwanshan Town of Taitung County
Social Aspects	Users	Family tours, youth camps, group travel
	Frequency of uses	100,000 tourists/month
Environmental Aspects	Safety	High impact prior entering the bike lane and there is a section of sleep slope after entering the lane.
	Feasibility	On the eastern Taiwan and an important node for 2 days travel; can be accessed via railway and airport.
	Lane form	Bicycle path; single circulating route
	Lane length	Length: 12km; width: 3-5m
	Paving materials	Concrete paving
	Slopes	Gentle, except a small section with a steep slope.
	Landscape resources	Open country; river promenades; country landscape; cultivated field
Industrial Aspects	Market and activities	Travel agencies; package tour; bike rental; dining; agricultural products
Political Aspects	Public infrastructures	Bicycle path, street furniture, landscape platform, direction indication system and interpretation facilities.
	Investing capitals	3 billion NT dollars
Disadvantages	Sustainable Development	Bicycle path and bicycle maintenance and management, tourists insurance.

This research evaluates the social, environmental, industrial and political aspects of Kwanshan Town. The result of evaluation is as following:

Social Aspect: Satisfying the tourists' demand with surrounding natural environment while riding the bike, and increasing the frequency of uses of bicycles.

Environmental Aspects: Planning for safe cycling environment create an integrated cycling travel system. Due to the advantage of cars and motorcycles in Taiwan, the bicycle environment is safer with implementation of bicycle paths rather than bicycle lanes. Figure 1 shows the degree of safety of a bicycle path and a bicycle lane can provide.

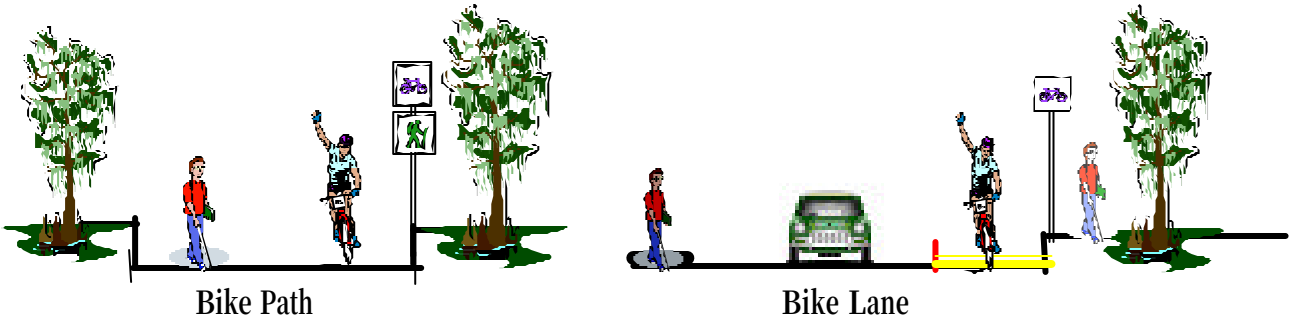

Figure 1. The degree of safety of a bicycle path and a bicycle lane.

Industrial Aspects: Expanding the bicycle sale and renting market and increasing the demand via scheduled activities and marketing strategies.

Political Aspects: Local government's determination of sustainable development and management; central government's investment on the construction capitals.

This research examines all bike touring routes and distributions in Taiwan (see table below). Together with questionnaires and further interviews, this research seeks to understand the bike users' characteristics and frequency of uses. The advantages and disadvantages of promoting bicycle tourism in Taiwan for its natural and humane environment are conducted.

Table 3. Lists of Bicycle Lanes in Every City and County of Taiwan

No.	City/County	Length (km)	Explanation	Existing Conditions
1	Keelung City	0		N/A
2	Taipei City	76.65	Urban resources/ Recreation and commute	Public bikes for rent
3	Taipei County	83	National Scenic Area/ Riverside recreation	Bikes for rent
4	Taoyuan County	121.5	Four towns along the sea/ Recreation and tourism	Routes under planning
5	Hsinchu County	45	Three towns along the sea/ Recreation and tourism	Routes under planning
6	Hsinchu City	17	Seaside resource/ recreation	No bikes for rent
7	Miaoli County	80.7	Hills and mountains resource/ sport	Bike touring information center
8	Taichung County	10.5	Green corridor/ recreation and tourism	No bikes for rent
9	Taichung City	3	Urban resource/ recreation and commute	No bikes for rent

10	Changhua County	44	National Scenic Area/ Recreation and Tourism	No bikes for rent
11	Nantou County	27.2	National Scenic Area/ Recreation and Tourism	No bikes for rent
12	Yunlin County	0		N/A
13	Chiayi County	0		N/A
14	Chiayi City	0		N/A
15	Tainan County	30	Water lily resource/Recreation and Tourism	No bikes for rent
16	Tainan City	1.2	Surrounding universities/Commute to school	Bike shops for students
17	Kaohsiung County	0.8	Seaside park/Recreation and Tourism	No bikes for rent
18	Kaohsiung City	10	Urban riverside resource/ Recreation	No bikes for rent
19	Pingtung County	39	National Park/ Recreation and Tourism	Bikes for rent
20	Iland County	41.7	Seaside/creak resource	Partial bikes for rent
21	Hwalen County	18	Seaside resource	Bikes fore rent
22	Taitung County	47	Seaside resource	Many bike rental shops
23	Penghu County	0		N/A
	Total	696.25		

The advantages of bicycle tourism can bring great values to Taiwan in terms of social, environmental, industrial/economical and political benefits.

Social benefits: Bicycle tourism can enhance personal health and well-being and therefore create a healthy environment for a healthy society. Bicycle tourism also encourages people to participate in exercising activities whilst at the same time help improving the social health and reduce the expenditure of medical expense. Promotion of bike riding or walking can reduce the dependency on automobiles and achieve the goal of being healthy cities. Besides, bicycle is the most efficient transport mode in getting to the destination within 10 km of city vicinity.

Environmental benefits: Reducing the dependence of automobiles can reduce the environmental impact on the natural resources and environment in those scenic areas and country towns.

Industrial/economical benefits: In order to cooperate with the government's policy, Giant and Merida bicycle manufacturing industries have their headquarters based in Taiwan. However, Taiwanese bicycle manufacturing industries are facing the intensive competition from China as the bike reproducing numbers and exports are gradually reducing each year. Promoting bicycle tourism market can help to reactivate the bicycle manufacturing markets and development.

Political benefits: The government's expenditure budget on bicycle lanes can create job opportunities and promote the national tourist market. The tourism market can also double the value of socio-economic benefits which help the numbers of bicycles grow sustainable and promote the local development.

Table 4. The Benefit Model of Bicycle Tourism Development in Taiwan

Bicycle Tourism			
Social Benefits Healthy Cities	Environmental Benefits Sustainable Development	Industrial Benefits Green Transport	Political Benefits Efficient Transport
Universal Bikes Reduce the Medical Cost Health & Well-being Wise Growth Efficient Use of Land	Environmental Friendly Tourism Reduce Environmental Impact Enhance Environmental Conscious Green Products	Planning and Construction of Bicycle Lanes Promote Local Development Increase Income and Job Opportunities Green Transport/Efficient Transportation	

5.RESEARCH FINDINGS AND CONCLUSIONS

From the literature reviews and case studies of bicycle tourism, it is known that cycling activities are very common in Australia, New Zealand and American/European countries where good cycling environment and many cyclists exist long before the development plan for bicycle lanes is implemented. The development of bicycle tourism is usually initiated according people's demand and corresponded with community and organizational groups to propel government in promoting the development. The bicycle tourism model of overseas countries is compared as below:

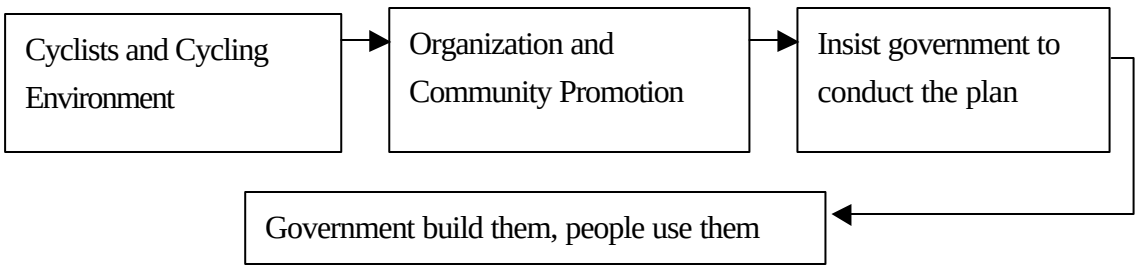

Figure 2. The overseas bicycle tourism model.

It is understood from the review of Kwanshan case study and other examples that the developm,ent of bicycle tourism is only on its preliminary stage in Taiwan. Its development model is derived and followed with central government budget which distributes to the local governments that are in demand of developing bicycle tourism. Local governments then authorise consulting companies to select and design the bicycle routes and assume there will be users appeared after the completion of the bicycle lanes.

To conclude above bicycle tourism development model, the comparison of bicycle tourism development in Taiwan and other countries is as followed (see Table 5 below).

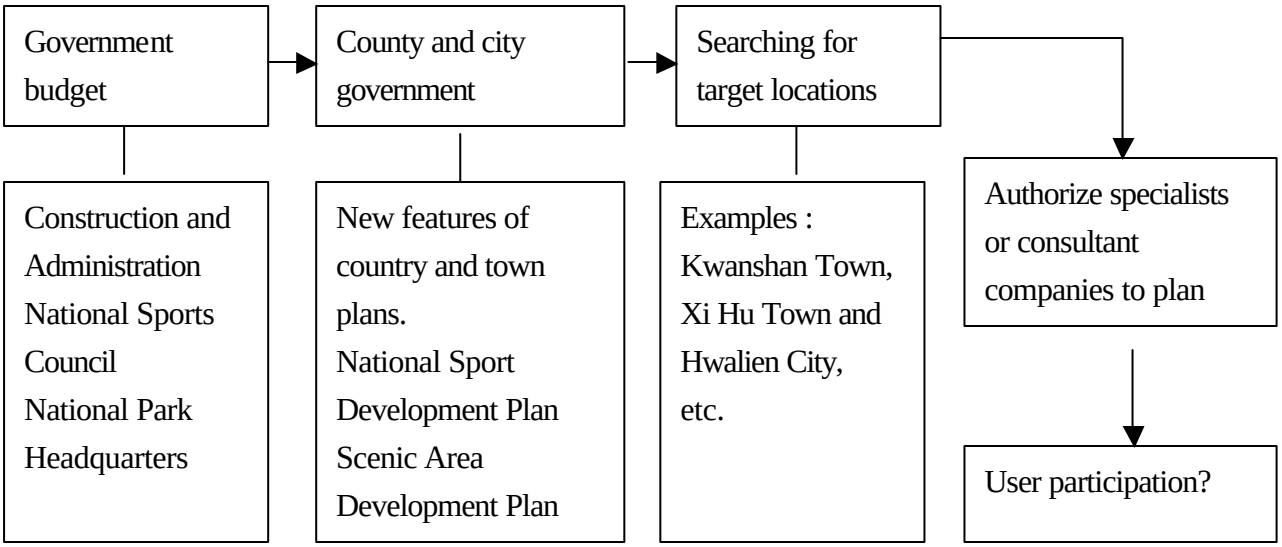

Figure 3. Bicycle tourism model in Taiwan.

Table 5. Comparison of bicycle tourism development in Taiwan and overseas

Comparing Items	Development in Taiwan	Overseas Development
Origin of bicycle tourism	Government's grant and plan	Public spontaneous demand
Bicycle users	Minor users; most are from fixed groups or associations	Many participators; frequent use of bikes
General understanding of bike lane	Bicycles shouldn't ride on roads.	Privilege for cyclists
Construction of bike lanes	Segregation of special bicycle lanes from major traffic	Integration of bicycle lanes into the existing environment
Placement location	Scenic areas, amusement areas, country towns and riverside areas	Scenic areas, amusement areas, country towns and urban areas
Development review	Cannot fit into users' real demand; lack of services, facilities, maintenance and management	Satisfying users' demand and sound services and facilities.
Development position	Preliminary stage of tourist development	Tools for commuting to schools and recreation
Development goals	Sport development	Sustainable development of green transportation mode and green products

Although Kwanshan is the most successful example of bicycle tourism in Taiwan at present and despite other developing cities and towns whose bicycle tourism is underpinning, bicycle tourism in Taiwan is still difficult to reach expected results and benefit returns. The major reason for this is the development uncertainty of the national goals that there is no such a clear position for the future development of bicycle tourism. In addition, local governments also neglect the user demand while planning for the bicycle lanes and there are also no relevant studies and information of such development.

Regarding the lack of information and experience available in every local government, this research has initiated four strategic principles below:

The future transport development of Ministry of Transport and Communication shall follow the principles of "Green Transportation".

The tourist development of Taiwan shall aim to reduce the traffic and encourage eco-tourism under the sustainable development goals.

Traffic safety is the major constraint and concern of the bicycle tourism development in Taiwan, therefore the central government shall focus on the country and towns and scenic areas as the major cycling spots.

Whilst the local governments construct the bicycle lanes for the promotion of bicycle tourism, it is important that the relevant facilities and environment are considered. Facilities should include bicycle information center, cycling maps, cycling organizations, bicycle rental management and insurance. The environment concern should have comprised the integration of resting spots, restaurants and hotels, etc.

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