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A Study on Establishing the Basic Direction for the Development of Korea's Highway Joint Area-Focused on the Hangdam-do Case

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Abstract

Recently, the concept of using a highway joint area is not just a limited place for solving physiological phenomena of highway users, but it is a comprehensive convenience facility that provides rest and convenience for drivers and passengers by providing parking spaces, restaurants, convenience stores, and toilets. In recent years, these highway rest facilities have become complex facilities, and large-scale developments have been made, so seven locations across the country have been developed. Meanwhile, the Korea Expressway Corporation has exclusive powers to develop highway junctions. The method of study is case analysis. As a result, the West Coast Expressway has already developed a joint area and outlet on the Haengdam-do site, and plans to further develop it in the future. However, in order to achieve both the goals of public interest and profitability, the development of these exclusive joint areas requires establishing the basic direction of development before development. Therefore, this study analyzed cases of Haengdam-do and presented feasibility in development and suggested the development of the linkage of local tourism resources rather than a simple food and beverage-oriented rental business. Through this, it is possible to expect a synergistic effect of using the expressway to tour the joint development site, rather than a brief stopover while using the expressway.

Keywords: *Highway, Connecting area development, Complex facility, Joint area, Development feasibility*

1. Introduction

Recently, the concept of using a highway joint area is not just a limited place to solve the physiological phenomenon of highway users, but it is a general convenience facility that provides rest and convenience to drivers and passengers by providing parking spaces, restaurants, convenience stores, and toilets. Is transforming [1][2]. On the other hand, in recent years, such highway rest facilities have become complex facilities, and large-scale development has been carried out. This started from the Ministry of Land, Infrastructure and Transport's Ministry of Land, Infrastructure and Transport, which developed a legal system

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by adding a road connection area development project to the Korea Highway Corporation's scope of work as part of the plan to secure investment resources for highway construction.

On November 30, 1990, the Ministry of Land, Infrastructure and Transport ordered measures to secure investment resources for highway construction, such as the tourism development plan around Asan Bay, and revised the Korea Expressway Corporation Act in 1993 to add development projects in the road joint area to the scope of the Korea Expressway Corporation. As a result, Korea Expressway Corporation was able to develop a highway junction. The development of highway junctions has the special feature that all background consumers can only access through the highway, and the goal of development direction is to increase highway utility and user convenience, and secure highway construction and maintenance costs. Therefore, there must be special characteristics that are quite different from general development projects. On the other hand, as part of public development, it is necessary to consider sufficient demand before development, social benefits and financial returns. In order to achieve this goal, it is required to establish the basic direction of the development project of the highway joint area.

Accordingly, the goal of this study is to analyze the existing development project cases and set the basic direction for the development of a Korean highway complex rest facility.

2. Theoretical considerations

2.1. Korea's highway junction development project

Here are 221 highway joint areas in Korea [6]. The grounds for installation are classified as attachments to the road under Article 2 of the Road Act. The purpose of the building is classified as a resting place among tourist resting places according to 5 Annex 1 of Article 3 of the Enforcement Decree of the Building Act [3]. The grounds for installation should be installed on the road to ensure smooth traffic, safety of traffic, or convenience for the public in accordance with the rules for road structure and facility standards. Joint area types and installation facilities consist of general joint areas, vans, simple joint areas, and shelter joint areas [7]. According to the road design tips, a comprehensive joint area is also possible. In accordance with Article 12 of the Korea Expressway Corporation Act, Korea Expressway Corporation is responsible for the installation and management of joint areas and major areas along toll roads. In addition, in accordance with Article 12 of the Korea Highway Corporation Act, it has the authority to develop and maintain road utilities in areas of rest, transfer facilities, and adjacent areas, and to develop and maintain road utilities and improve user convenience [5].

Table 1. Legalization of the development of highway junctions

Date	Contents	Remark
1996. 8	Approved the basic design (draft) of Haengdam-do general rest facility	MLTMA
1999. 5.	Selected as a private investment attraction (BOT) and a private business (Haengdam-do Development Co., Ltd.)	-
-	Acquisition and implementation plan of public water reclamation license	-
2001. 1.	Haengdam-do Joint area Construction completed and business commenced	-

2002. 4.	Completed the main construction of the first stage of Haengdam-do development	-
2012. 1.	Approval to change the road connection area development project in Haengdam-do	MLTMA

2.2. Complex rest facilities in Korea

There are total of seven complex rest facilities in Korea developed and operated by the Korea Expressway Corporation. The main facility is a complex development of outlets based on a basic joint area [5].

Table 2. National complex development joint area

No.	Facility name	Location	Major facilities
1	Haengdam-do Joint area	West Coast Line 275K	Joint area, gas station, outlet, etc.
2	Deokpyeong Joint area	Yeongdong Line 70K	Joint area, gas station, outlet, dog park, etc.
3	Okcheon Encounter Square	Gyeongbu Line 260K	Joint area, gas station, carpool parking lot, etc.
4	Giheung Shopping Mall	Gyeongbu Line 392K	Joint area, gas station, carpool parking lot, etc.
5	Majang Complex Joint area	Jungbu Line 327K	Joint area, gas station, outlet, mart, etc.
6	Siheung Sky Joint area	Seoul outline105K	Joint area, gas station, restroom, bus stop
7	Maesong Joint area	West Coast Line 316K	Joint area, gas station, lorry driver convenience facilities, etc.

3. Analysis of Korea expressway joint development project cases

One of the largest and most complex development projects in Korea's highway joint area is the development example of Haengdam-do, the west coast highway joint area. Haengdam-do is an island type that can only be accessed through the West Coast Expressway.

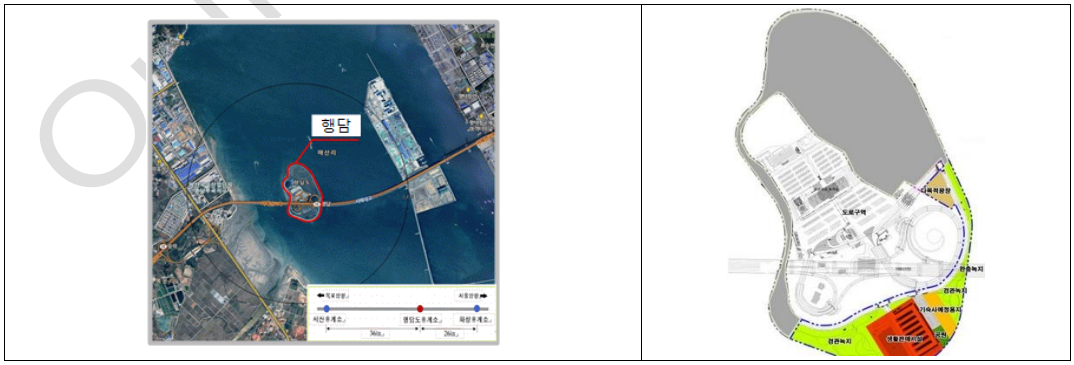

Figure 1. Haengdam-do location and development stage

The total area of Haengdang-do is 156,054 ㎡, 17 of which are 153,826 ㎡ by the Korea Expressway Corporation and 2,228 ㎡ by the government. For urban planning, it corresponds to the planning management area, coastal land, and tourism recreational district unit planning area. Prior to development, it consisted of some flattened land, hybrid land, and public waters.

Table 3. Haengdam-do basic and development status

Division	Contents
Location	Dangjin-si, Chungcheongnam-do
Area	Otal 17 parcels 156,054 ㎡ (47,2006 / 3.3 ㎡)
Rights	Owned by Korea Expressway Corporation: 153,826 ㎡ (Government) Ministry of Land, Infrastructure and Transport: 2,228 ㎡
City planning	Planned management area, coastal land (coastal management law) Sightseeing and Recreation Type District Unit Planning Area (designated release)
Shape and use situation	Uneven land flattened after reclamation of public waters Hybrid state

Existing development sites can be divided into existing land areas and public water reclamation sites. The existing land part was developed as a distant resting place for families. The public sleeping landfill was developed as an outlet. Both facilities boast the largest scale in Korea with a total floor area of 50,511.43 ㎡ and a building area of 44,911.34 ㎡. There are more than 2,000 parking spaces. Originally, there was a need for development because there were aspects that could not sufficiently reflect the essential purpose of the development project of the highway joint area. As a result of the deliberation of the Central Urban Planning Committee in December 2006, the release of the National Industrial Complex for all members of Haengdam-do was completed on the premise of establishing a second-class district unit plan. Since then, restrictions on regulations related to industrial complexes have been lifted, and in order to maximize the synergistic effect of development, along with the existing Haengdam-do Joint area, the first stage project, a retail outlet premium outlet was built in 2015.

1st Stage(Land, Joint area)	2-1 Stage(Public Landfill-Outlet)
	

Figure 2. Development status of Haengdam-do stage 1 and 2

On the other hand, Haengdam-do is not just a highway junction, but a coastal land. Coastal land refers to the scope of the marine environment, both directly and indirectly, of all human activities and effects occurring on land. Common tidal flats, coastal wetlands, beaches, continental shelves, bays, etc. The land area where activities affecting the nearby marine environment is also included in the coastal range, and is often defined as a watershed area, especially in relation to water circulation [4] In the Yeonak land, the land is a joint region between the ocean and the continent, and it is in a physically and environmentally unstable balance. Regarding climate change, it is more vulnerable to disasters, and is an area where sea level rise and coastal erosion, weather changes due to temperature changes in seawater, and sudden changes in precipitation patterns occur frequently [8].

4. Development basic direction

In order to derive the basic direction, it is sufficient financial feasibility to cover the cost of highway maintenance. Then, as in the case of development, it is necessary to secure economic feasibility to maximize social benefits in terms of both public highways and characteristics of the Korea Expressway Corporation. In addition, sufficient demand must be secured. As in the case of development, there is a special characteristic that the consumer can only access through the highway, whereas both aspects that are easily possible through the high speed are valid [9]. Furthermore, rather than using a joint land development site while moving for the purpose of using the highway, it is necessary to consider the aspect of using a high speed to use the joint land development site.

Considering these aspects, the basic direction of development needs to be checked in advance and developed in an active manner so that sufficient value can be created after development rather than a simple development and rental method [11]. In the case of the simple rental method, it is necessary to consider the cost of reinvestment due to the aging of facilities, and professional tenant management and facility management are required. In the case of the direct operation method, considering the characteristics of the construction, it is possible to support small-sized businessmen or local merchants to operate small stores, or to achieve win-win operation, thereby enhancing the effectiveness of social benefits [10]. However, it should be considered that Korea Expressway Corporation, which has no expertise in the operation of convenience facilities and has a business area defined by relevant laws, is not easy to manage and operate individually. In addition, if considering the development of tourism resources in connection with the surrounding environment rather than simply facilities that supply food and beverage, there is an effect that the background demand can increase significantly [12]. In other words, it means that the highway can be used to visit the joint development site rather than visiting the joint development site while using the highway.

5. Conclusion

The Ministry of Land, Infrastructure and Transport in Korea added a road joint area development project to the Korea Highway Corporation's scope of work as part of the plan to secure investment resources for highway construction. Accordingly, the Korea Expressway Corporation Act has the authority to develop and maintain roads in areas of rest, transfer facilities, and adjacent areas, and to develop and improve road utility and user convenience. As a result of analysis of the development example of Haengdam-do, a coastal highway junction, it is possible to develop facilities such as food and beverage business and medical outlets. Financial and economic feasibility and demand must be secured to establish the basic development direction. Accordingly, in the case of a rental operation, it is easy to secure

financial feasibility, but the economic feasibility is somewhat reduced and it is necessary to consider the burden of reinvestment costs due to future aging. The direct operation method may increase the economic feasibility, but there is a risk of lack of direct operation expertise. Lastly, in addition to food and beverage and medical sales, joint development to tourism resources, etc. can be a direction to ensure sufficient demand to increase the demand for highway use together for the purpose of the development site itself.

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