TRANSPORTATION PLANNING AND LOCAL RESIDENTS' EXPECTATIONS IN LESS DEVELOPED AREAS IN JAPAN

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1. OUTLINE OF SHIKOKU ISLAND

Shikoku is one of the four major islands of Japan and the smallest of them. It is located in the south western part of Japan. The area is 18,800 km^2, 4.97% of Japan. Most of the area is steep mountains. The rate of land covered by forest is 74.2% and it is larger than the national average of 65.2%. The population was 4,189 thousand in 1995. The population share is 3.34% and has been decreasing. Compared with other areas, Shikoku is less populated. Residents are more aged than the national average. The rate of people older than 65 years to the whole population in Shikoku was 17% while the national rate was 13% in 1992.

About one third of the total population are living in four cities where local, prefectural, governments are located; Matsuyama, 461 thousand; Takamatsu, 331 thousand; Kouchi, 322 thousand; and Tokushima, 269 thousand. Many other municipalities suffer from population decrease. The number of municipalities in which population has decreased between 1955 and 1995 is the 180 of 216 total municipalities. Particularly, 53 municipalities have lost more than half of their population in the term.

The G.D.P. share of Shikoku in Japan is only 2.6%. The rank of income per capita of the four prefectures which compose Shikoku is 22nd, 31st, 39th, and 44th. The average income level of Shikoku is about 80% of that of the nation. Residents in the area have felt their economic situation has become worse year by year.

They have considered that the major reason why they are behind economically is the transportation disadvantage because Shikoku was an island isolated from Honsyuu, the mainland of Japan. Therefore, construction of bridges which link Shikoku to Honsyuu has been the most important regional investment. It was often said figuratively that construction of over sea bridges was Shikoku residents' long earnest desire.

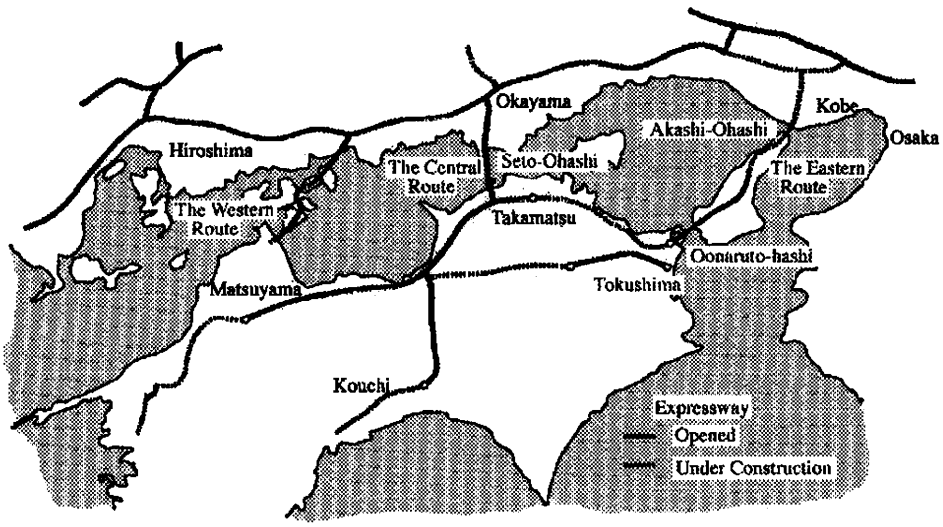
2. HONSYUU SHIKOKU BRIDGES

(1) Great National Transportation Investment

Honsyuu-Shikoku bridges construction is a truly large national transportation investment which produces large benefits to Shikoku residents. The Japanese central government decided to construct bridges along three different routes at the same time after severe competition among the routes. Figure 1 shows these three routes. The total amount of investment adds up to 3,114 billion yen (30 billion dollars). Honsyuu-Shikoku bridge authority was established in 1970 and started bridge construction in 1975.

The Kojima-Sakaide route, the central route, has a 37.3 km road length and a 32.4 km railway length with seven bridges and was completed in 1988.

Figure 1 Honsyuu shikoku Bridges and expressway



The bridges are doubledecked highway and railway. The construction cost was 1,130 billion yen (10.8 billion dollars). The Kobe-Naruto route, the eastern route, has an 89.6 km length with two big bridges and will be completed in 1998. This route was originally designed to have highway and railway too and one of the two bridges which was already completed in 1985 is doubledecked. But another bridge, Akashi-Ohashi, which is under construction has been changed to a highway only bridge due to technical reasons. The bridge has a 3,910 m total length and 1,990 m center span. This is the longest center span bridge in the world. The construction cost is estimated at 1,381 billion yen (13.2 billion dollars). The Onomichi-Imabari route, the western route, has a 59.4 km length of road with nine bridges and will be completed in 1999. One of the bridges is an 890 m center span cable stay bridge and it is the longest cable stay bridge in the world. The construction cost is estimated at 603 billion yen (5.7 billion dollars).

(2) Remarkable Effect of Transportation Improvement

The central route was completed in 1988 and its improvement effect has been remarkable. Table 1 shows the time reduction effect produced by the Kojima-Sakaide route opening. Driving time from the four prefectural capital cities on Shikoku to Okayama, the nearest prefectural capital city in Honsyuu decreased from 4 hours and 28 minutes to 3 hours and 2 minutes on average. Railway time in the same section also decreased from 3 hours and 38 minutes to 2 hours and 14 minutes. Figure 2 shows the amount of car traffic between Honsyuu and Shikoku. The amount has increased greatly. The average traffic amount per day was about 20,000 vehicles before the bridges' opening. Now it is more than 30,000. Figure 3 shows the annual number of passengers between Honsyuu and Shikoku. It has increased from 33 million per year to 46 million per year.

(3) Vast Construction Cost and The Problem of Tolls

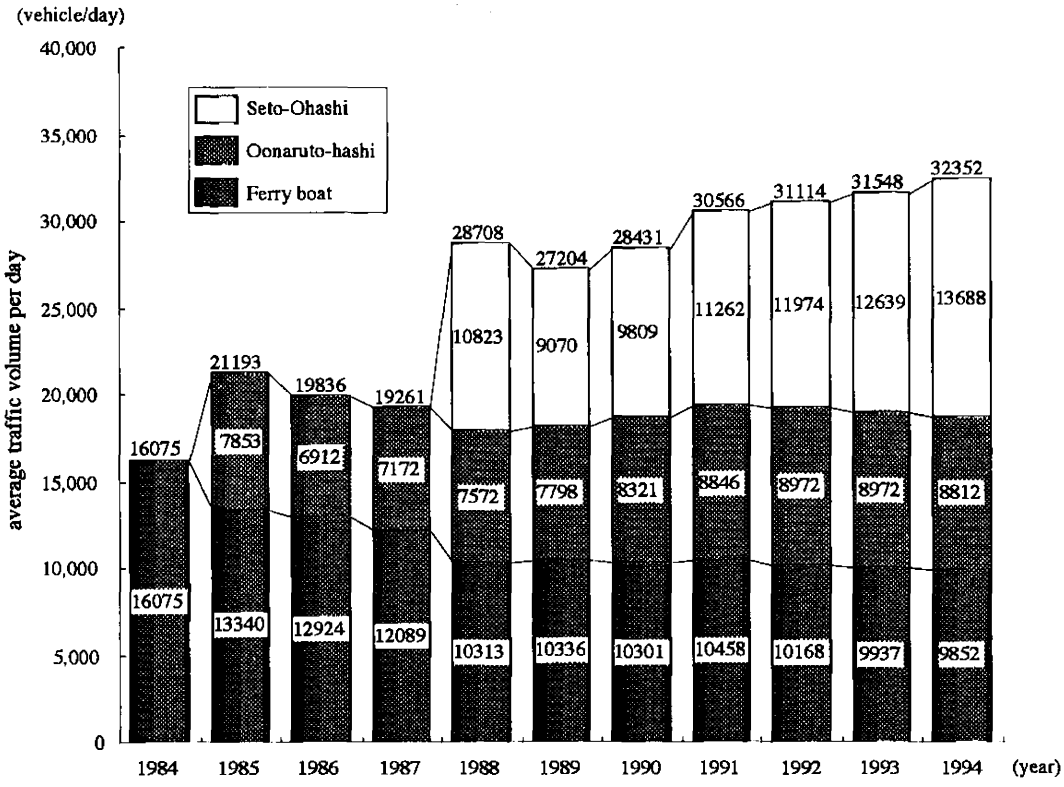
Honsyuu-Shikoku bridge authority has a serious fiscal problem. The amount of the road toll was decided in a way that construction cost is repaid in thirty years. The authority estimated the amount per day of average traffic crossing the bridges at about 25,000 and this number is the base of the road tool. However, the actual number is about 13,000.

Table 1 Time decreasing effect by Kojima-Sakaide route opening
(from Okayama to four Prefectural Cities in Shikoku)

		Tokushima	Takamatsu	Matsuyama	Kouchi
by car	before	4 h 13 mi	2 h 08 mi	6 h 00 mi	5 h 32 mi
	after	3 h 22 mi	1 h 17 mi	3 h 36 mi	3 h 52 mi
	reduction	51 mi	51 mi	2 h 24 mi	1 h 40 mi
by railway	before	3 h 37 mi	1 h 42 mi	4 h 49 mi	4 h 23 mi
	after	2 h 13 mi	58 mi	3 h 02 mi	2 h 43 mi
	reduction	1 h 24 mi	44 mi	1 h 47 mi	1 h 40 mi

(a quatation from reference 2)

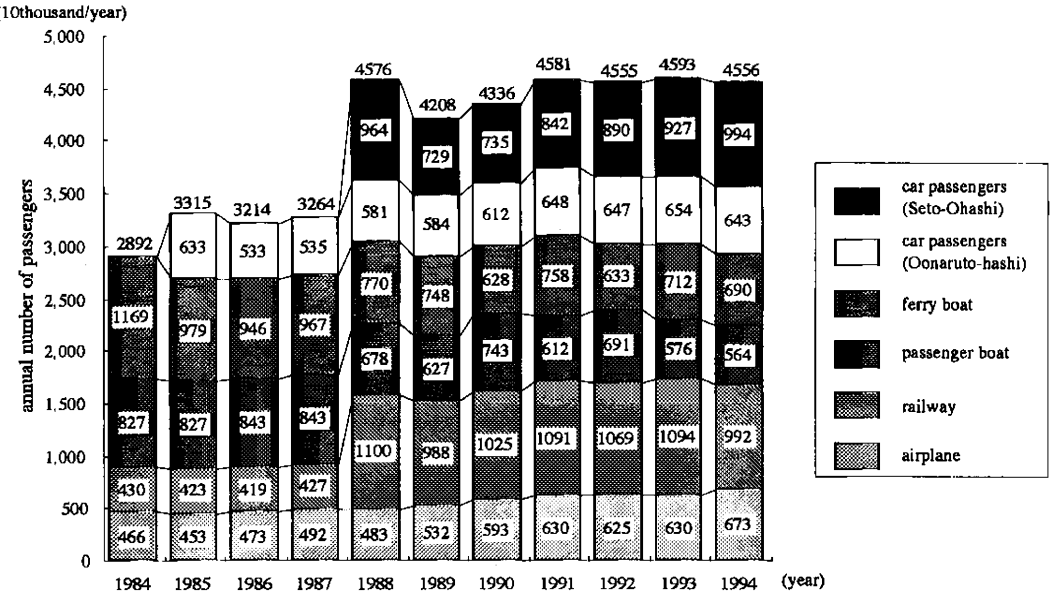
Figure 2 The amount of car traffic between Honsyuu and Shikoku (a quatation from reference 2)



Therefore, the authority has a large deficit.

On the other hand, residents in Shikoku have complained about the road toll. The toll for one passenger car is 5,700 yen (54.3 dollars) for a one-way trip over the strait section of 15.4 km and 6,500 yen (61.9 dollars) for a one-way trip over the total route of 37.8 km. This means the toll per one kilometer is 370 yen for the strait section and 172 yen for the total route. It is estimated that the toll of the strait section is about 17 times that of the average traffic toll of regular expressways in Japan. Certainly the toll of Honsyuu-Shikoku bridges is very expensive because the construction cost of long bridges is vast.

Figure 3 Annual number of passengers between Honsyuu and shikoku (a quatation from reference 2)



3. ROAD IMPROVEMENT IN SHIKOKU

(1) Backward in Road Improvement

Shikoku is backward in road improvement. The rate of physically improved road length to the total length in the area is 40.2% while that of nation is 49.3% in 1993. The rate of Shikoku was 22.3% and that of the nation 31.1% in 1980. These figures show that the roads of Shikoku are behind and the degree of the gap between Shikoku and the nation has not changed. Moreover, the rate of Shikoku is the worst among ten regions which comprise Japan.

The first Japanese expressway was opened in 1963 and the total length opened was 5,404 km in 1993. On the other hand, the first expressway of Shikoku was opened in 1987 and it is 24 years behind the rest of the nation. The total length opened was 145 km in 1993. The rate of expressway length opened to that planned is 21% in Shikoku and 47% in the nation at this time. However, expressway construction in Shikoku has been vigorous recently. Japan road corporation invests more than 10% of its total annual construction fund in the area. It is projected that a 374 km expressway including Honsyuu-Shikoku bridges will be opened in 1998. This means that the rate of expressway length opened to planned will be 54.6% in Shikoku and it is almost same as that projected for the nation, 58.4%. Thus, the expressway network in Shikoku will be considerably improved by the end of the 20th century.

(2) Recent Reconsidering of the Tool Road System

The traffic volume on an expressway line in Shikoku is at most 17,000 vehicles a day and 10,000 on average. While the national average is about 25,000 and, about 65,000 in the line between Tokyo and Osaka. On the other hand, construction cost in Shikoku is more expensive because of the steep mountainous topography. Therefore, the Japan road corporation will have certain deficit on every expressway line in Shikoku and their management must be supplemented by money transfer from busy lines outside of the area.

People in major metropolitan areas have claimed

that expressway building in less developed areas is not efficient economically and such expressway lines should be built at the cost of their payment. They insist that if the corporation had not applied an internal subsidy system they should have enjoyed free expressways in major metropolitan areas and it would lead the total economy of our nation to a better position. On the contrary, residents in less developed areas insist that the accessibility to express transportation services should be equalized among the regions and they take this transportation right for granted.

Recently the central government has started reconsidering of Japanese tool road system which has supported expressway construction in less developed areas. It seems that the internal subsidy system will be kept in the future but the amount of transfer fund may be altered. People in less developed areas are afraid that the expressway building speed in their areas will become slower.

(3) Reliability of Road Network

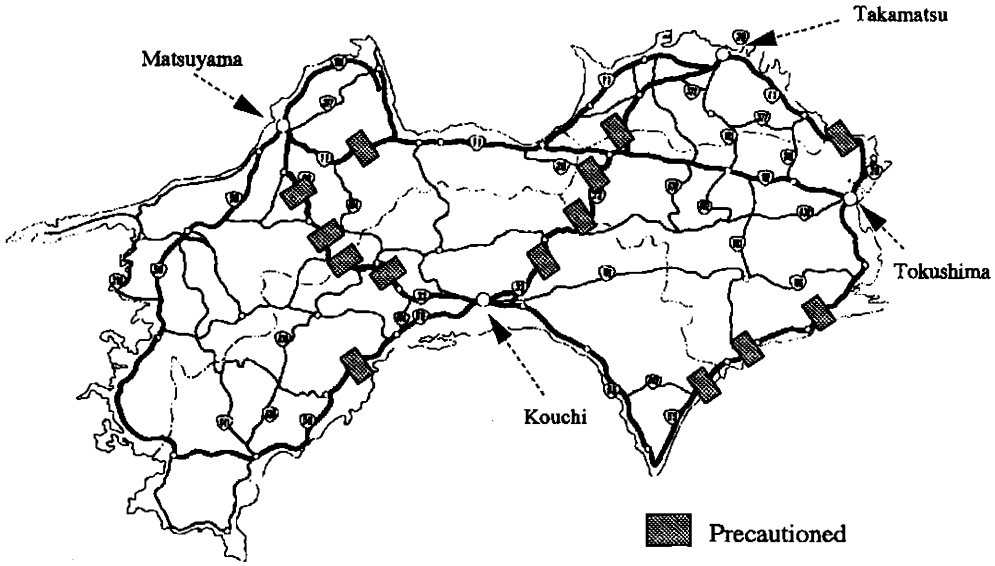
Since Shikoku is located in south western Japan and the land is mountainous, it has sometimes suffered from natural disasters, mainly typhoons. Thus, maintaining reliability is one of the main issues of the road network in the area. There are many road sections that must take precautions against natural disasters. A section is physically closed if the occurrence of a disaster is expected in such precaution sections. Figure 4 shows the location of precaution sections of the national highway directly administrated by the Ministry of Construction. The length of precaution road is 644.6 km and it corresponds to 23% of the total length of national highway networks in Shikoku. There were 128 closures in the national highway network during last five years. This means that we must prepare for a sudden deterioration of the primary road network about 26 times a year (Asakura and Kashiwadani [1995]).

Therefore, a reliable road network is earnestly desired by local residents. The expressway is expected to provide this because it is more reliable than ordinary national highways and gives better network redundancy.

4. ESTABLISHMENT OF SHIKOKU RAILWAY COMPANY

The old Japan National Railway corporation was

Figure 4 Location of Precautioned Sections of Shikoku Road Network (a quatation from reference 1)



divided into private companies, six regional passenger railway companies and one fright railway company in 1987. Shikoku railway company is the smallest company among them. The total operating length is 856 km and the number of employees is 4,200. In addition railway facilities in Shikoku are worse compared with the national average as well as roads. The rate of double truck line is 5.1% and the electrification rate is 27.5% while that of the national average is 32.9% and 54.1% respectively.

It was easily projected that the new company would generate a considerable deficit every year. Then the central government offered a special fund to stabilize the management of the company. The amount was 208.2 billion yen (2 billion dollars). Table 2 shows the trend of JR Shikoku company's annual account. The amount of operation revenue is about 80% of that of the operating cost. But, the fund has produced a fairly good interest revenue. It could cover enough of the deficit due to operating revenue and cost. Moreover, opening the Seto-Ohashi line, a railway line over Honsyuu-Shikoku bridges has produced a considerable increase of passengers. As a result, the company gained a profit.

However, the account recorded its first deficit in 1994. There are two reasons for the deficit. One is less interest revenue because of recent lower market interest rates and the other is loosing passengers. As expressway improvement proceeds, some passengers have transferred from the railway to cars. Since the expressway in Shikoku will be improved greatly in the near future as mentioned before, the railway company may loose more passengers. They try to improve their poor railway facilities but, the money to invest is very restricted. Subsidy programs by governments are not sufficient because the operating organization is a private company. Recently, they have been improving the speed of the line with local governments cooperation. It is very important that local governments support transportation companies or corporations.

5. TRANSPORTATION IMPROVEMENT EFFECT IN LESS DEVELOPED AREAS

(1) Residents' Expectations and the Financial Problem

We have seen the state of transportation facilities in Shikoku, a typical less developed area so far. The transportation facilities on land in Shikoku were certainly inferior. But, transportation improvement is catching up with the national average. Especially, the three routes of Honsyuu- Shikoku bridges are emblems of great support by the central government. They offered an extra-large fund to residents in Shikoku and its effect is emerging now and will continue in the near future.

However, transportation corporations or companies have serious economic or fiscal problems because of less traffic demand. Higher level transportation services are usually supplied by tolls in

Table 2 The trend of annual account of JR Shikoku (10 billion yen)

	'87	'88	'89	'90	'91	'92	'93	'94
operating								
revenue	352	446	451	495	528	532	528	496
cost	502	554	567	582	619	642	641	629
profit	−150	−108	−116	−87	−91	−110	−113	−133
non operating								
revenue	8	14	26	23	21	9	6	6
cost	0	1	1	1	1	2	3	0
interest revenue	152	152	152	150	142	141	135	122
current profit	10	57	61	85	71	38	24	−5

Japan. Therefore, economic efficiency is a very important issue in transportation investment. This is a weak point for less developed areas.

On the other hand, residents earnestly desire transportation improvement. Their social and economic system is behind and stagnant. Thus, they feel that they can do nothing because of a large economic gap between prosperous major metropolitan areas and poor, less developed areas. Then, they hope that transportation improvement on a large scale will revolutionize their old social economic system and present them unexpected benefits.

Residents in Shikoku entrusted their economic prosperity to Honsyuu-Shikoku bridges. The first route was completed in 1988. It brought about a remarkable transportation improvement effect but they still do not have economic prosperity. On the contrary, income per capita for Shikoku residents has rather been slightly decreasing as seen in Table 3 even after the bridges opening. Then, some have begun to insist that Shikoku was behind in expressway improvement and it prevented them from economic prosperity. Certainly there were only 71 km of expressway against 4,405 km national length when the first Honsyuu-Shikoku bridges were opened. But, the expressway length opened is 222 km in 1996 and the rate of length opened to planned in Shikoku is expected to reach almost the same level as the national average in 1998.

However, Shikoku residents cannot find any sign of prosperity though they have believed expressway improvement added to Honsyuu-Shikoku bridges ought to produce it. So they have changed their opinion again. They say that even if all bridges along the three routes are completed Shikoku is not linked to Honsyuu firmly. They continue that these bridges may change Shikoku from an isolated island, but the new position is just a peninsula. They insist that Shikoku needs more transportation investment on a large scale to obtain economic prosperity. It is one of opinions which support the new Pacific Ocean National Axis plan. The plan is going to build one more range of bridges between Honsyuu and Shikoku and bridges or a tunnel between Kyuusyuu and Shikoku.

On the contrary, some others have claimed that those people have too high a degree of expectations for transportation improvement and they always attribute their economic or social problems to a lack of transportation improvement benefits. They say that residents in Shikoku should stop making excuses and reform themselves. They should make an effort by themselves to attain a better quality of life.

(2) Communication and Combination among Less Developed Areas

People in less developed areas are apt to depend on others but becoming independent is the most important step for establishing their own life style. Economic prosperity is only one measure of a better life. People in those areas can enjoy a high quality of natural environment and they can experience a variety of local culture and products.

The National Land Agency has recently encouraged residents in less developed areas to communicate with each together using high level transportation facilities. Expressways have reduced driving time among these areas and even residents in less developed areas can communicate easily with residents in other areas. They may be similar in their economic, social or natural situation or they may find the different flavor of each local culture. It would be fruitful for these people to discuss together. Moreover, it is hoped that all residents will combine their efforts to attain a better quality of life. The

Table 3 Income per capita index of Shikoku

year	'75	'80	'85	'88	'89	'90	'91
index	86.4	86.6	80.3	79.9	79.7	79.5	79.3

Note, national average is 100

agency named regional communication or combination axes along some ranges of expressway routes in which local people communicate or combine. It is a new idea that makes residents in less developed areas become active.

Now Japanese transportation investment on a large scale is going to face a turning point. Transportation facilities with a higher level of service will be considerably widely distributed all over the nation at the early stage of the 21st century. On the other hand, the amount of available fiscal funding is decreasing because we should pay much more money to social welfare problems. It is no longer the era when residents in less developed areas only expect or dream about benefits of transportation improvement on a large scale. They should have their own vision by themselves utilizing the transportation facilities improved.

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