Socialist Republic of Viet Nam

FY2015 Ex-Post Evaluation of Japanese ODA Loan Project
"Third National Highway No. 1 Bridge Rehabilitation Project (I) (II)"

External Evaluator: Mitsunori Numaguchi, IC Net Limited

0. Summary

National Highway No. 1 had not functioned well in the section between Can Tho and Ca Mau, owing to damages from the Viet Nam War and subsequent inadequate maintenance. People had been forced to depend on inland water transportation for the greater part of logistics in the Mekong Delta Region. This project aimed to enhance the efficiency of road transportation by repairing and replacing bridges along the highway and thereby contributing to the economic growth of this region and help strengthen international competitiveness. Road development has been given higher priority in the development policy of the Vietnamese government from the time of the appraisal up to the time of the ex-post evaluation. Development needs have remained high even at the time of the ex-post evaluation. The relevance of this project, which was confirmed to be in conformity with Japan's ODA policy at the time of the appraisal, is high. However, the efficiency of this project is low because the project cost was higher than planned and the project period was significantly longer than planned. The scope of work was changed from 17 bridges to 16 bridges because Tra Kha Bridge, one of the bridges covered by this project, was transferred to the World Bank project. This change in scope was proper in both substance and process. The operation and effect indicators set at the time of the appraisal have mostly achieved the targets and other positive impacts have also appeared to a certain extent. Therefore, the effectiveness and impact of this project are high. Road maintenance agencies, including the Directorate for Roads of Viet Nam, are well established and have sufficient experience and skills. The budget for road maintenance is secured at the level required at the time of the appraisal and an additional budget can be appropriated whenever required. Accordingly, there is no financial problem and the sustainability of this project is high at the time of the ex-post evaluation.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description

The Project Area
(from Can Tho City to Ca Mau Province)

A View of Cai RangBridge

1.1 Background

The transportation system of Viet Nam consists of roads with the total length of over 210,000km, railways extending about 2,650km, inland water transportation mainly via the Red River and Mekong River, coastal and ocean transportation via seven large ports, including the ports of Saigon and Hai Phong, and aviation. Looking at the prospect of each transport mode in 2001 at the time of planning, in the case of cargo transportation (in terms of weight), road transportation accounted for 63.9% of the total, inland water transportation accounted for 21.9%, coastal marine transportation 9.8% and railway transportation 4.4%, respectively. In the case of passenger transportation, roads accounted for 89.8%, railways accounted for 0.6%, waterways 8.9% and aviation 0.5%, respectively. In both cases, the rate of dependence on roads was the highest.

Thus, domestic transportation in Viet Nam is mostly served by road transportation in volume in the cases of both cargo and passenger transportation. Although the importance of roads in the transportation sector is clear, they did not sufficiently perform their functions owing to damages from the Viet Nam War to major highways, including National Highway No. 1 connecting the north to the south. Moreover, subsequent maintenance was inadequate, which caused the scraping of concrete and the cracking and warping of the bridge body for lack of enough strength to support the weight of passing vehicles.

The means of logistics in the Mekong Delta Region can be largely divided into two categories: (1) Inland water transportation via rivers and waterways, and (2) Road transportation via national and provincial roads. This region largely depends on inland water transportation established in the period of French reign for logistics, which accounts for about 70% of the total

transportation in this region. It was the only region that had the share of inland water transportation higher than road transportation in the whole of Viet Nam.

The establishment of a road network was left behind, whereas inland water transportation was established relatively well. This situation was an obstacle not only to the movement of people but also to large cargo transportation. In addition, bridge construction and improvement were also remarkably delayed, especially southward from Can Tho City, where people were forced to cross the river by ferry.

1.2 Project Outline

The objective of the project is to improve the efficiency of road transportation in the Mekong Delta region by repairing and rebuilding bridges along the National Highway No. 1 (Can Tho to Ca Mau) (176km) in southern Viet Nam, thereby contributing to the economic growth of this region and help strengthen international competitiveness.

Loan Approved Amount/ Disbursed Amount	5,013 million yen/4,937 million yen(Phase I) 1,038 million yen/553 million yen (Phase II)	
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2003/March, 2003(Phase I) March, 2010/March, 2010 (Phase II)	
Terms and Conditions	Interest Rate	1.8%(Phase I) 1.2%(Phase II)
	Repayment Period	30 years
	(Grace Period)	(10 years)
	Conditions for Procurement	General untied
Borrower/ Executing Agencies	The Government of the Socialist Republic of Viet Nam/ Ministry of Transport	
Final Disbursement Date	September, 2012(Phase I) (Extended from July, 2009 as the initially planned date) July, 2013 (Phase II)	
Main Contactors	China State Construction Engineering Corporation (People's Republic of China)/ DatPhunong Joint-Stock Company(Viet Nam)/ Transportation Import Export and Construction Joint-Stock Co(Viet Nam)/ ChauThoi Concrete Joint-Stock Company No.620 (Viet Nam)	
Main Consultants	Japan Bridge & Structure Institutes, Inc. (Japan) /Chodai Co., Ltd. (Japan)/Oriental Consultants Co., Ltd. (Japan)	

Feasibility Studies, etc.	Feasibility Study ・APECO(Asia Pacific Engineering Consultants)(Executing Body: Vietnamese Government) (roads portion), 1997 ・Ministry of Transport Viet Nam (bridges portion), 2002
Related Projects	[ODA Loan] (Project Name, LA month/year) • National Highway No. 1 Bridge Rehabilitation Project (January 1994/March 1996) • Second National Highway No. 1 Bridge Rehabilitation Project (March 1996/March 2000) • Binh Bridge Construction Project (March 2000) • Red River Bridge Construction Project (March 2000/March 2002/March 2004) • Cuu Long (Can Tho) Bridge Construction Project (March 2001) • Bai Chay Bridge Construction Project (July 2001) • Transport Sector Loan for National Road Network Improvement Project(March 2004/March 2009) • Nhat Tan Bridge Construction Project (March 2006) [World Bank] (Project Name, Implementation Period) • National Highway No. 1 Improvement Project (from December 2000 to June 2011) [Asian Development Bank] (Project Name, Implementation Period) • Kunming to Hai Phong Logistics Promotion Project (from April 2003 to April 2008) • Noi Bai to Lao Cai Road Improvement Project (from October 2006 to December 2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Mitsunori Numaguchi (IC Net Limited)

2.2 Duration of Evaluation Study

Prior to this ex-post evaluation, the study has been carried out as follows:

Duration of the Study Period: December, 2015 – January, 2017

Duration of the Field Study: March 14, 2016 – March 29, 2016 and July 3, 2016- July 15, 2016

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance (Rating:③[2])

3.1.1 Relevance to the Development Plan of Viet Nam

The road development policy in the *Ten-year Socio-Economic Development Strategy (2001–2010)* formulated by the Vietnamese government at the time of the appraisal attached importance to the improvement of National Highway No. 1, the construction of Ho Chi Minh Highway, the provision of roads to the industrial development district of each region, the improvement of major bridges, and road rehabilitation and new road construction for better access to countries in the Greater Mekong Sub-region. In the *National Transport Development Master Plan (for 2010 as a target year)* included in the *Strategic Study on Transportation and Traffic Development in Viet Nam* as a mid-term development plan in the transportation sector (prepared by JICA in July 2000 for 2020 as a target year), a ten-year plan was formulated for the purpose of developing the transportation sector, conserving the environment and promoting integration with its neighboring countries and globalization. In the master plan, the required amount of investment was estimated at about $10.5 billion for the Vietnamese government to implement the ten-year plan. In terms of amount, investment in roads accounted for 65% of the total, followed by railways (13.2%), port and marine transportation (11.5%), aviation (6.6%) and inland water transportation (3.6%). In the ten-year plan as part of the master plan, this project was on the list of promising projects in the Mekong Delta Region and regarded as one of the projects to which the highest priority should be given and which should be launched by 2005.

After the formulation of the above-mentioned transportation and traffic development strategy, the transportation and traffic infrastructure of Viet Nam had been steadily constructed and improved with the focus on the highway network. Nevertheless, the pace of economic growth exceeded that of infrastructure improvement and the volume of cargo transportation increased more than initially expected. Therefore, more provision and improvement of transportation infrastructure became an urgent challenge. Under these circumstances, the Vietnamese government formulated the *Five-year Socio-Economic Development Plan (2006-2010)* with emphasis on road rehabilitation and new road construction.

As the development policy of the Vietnamese government in the transportation sector at the time of the ex-post evaluation, the *Road Development Strategy (for 2020 as a target year)* formulated in 2013 stipulates that National Highway No. 1 in the southern region covered by this project should be widened to four lanes. Moreover, it stipulates the construction of an expressway which can lead to Ho Chi Minh City as an entrance to this region. In the *National Transport Development Master Plan (for 2020 as a target year)* formulated in 2010 under the

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[2] ③: High, ②: Fair, ①: Low

strategy, it is planned to advance improvement work on the whole stretch of National Highway No. 1 in the southwestern part of Viet Nam so that it will have two lanes on each side. Accordingly, this project is relevant to the development policy of the Vietnamese government from the time of the appraisal to the ex-post evaluation.

3.1.2 Relevance to the Development Needs of Viet Nam

As of the time of the appraisal, there were about 7,200 bridges throughout Viet Nam. About 40% of them were temporary ones and had some problems, including weight limitation due to obsolescence. There were also places where no bridges were available even on major national roads and people crossed the river by ferry in some cases.

Reflecting economic growth, traffic continued to increase rapidly on highways connecting urban areas such as Hanoi and Ho Chi Minh to local cities, such as Hai Phong and Can Tho. Traffic was expected to keep increasing as urban population and the number of vehicles increased as a result of income increases along with economic growth. The government had no choice but to cope with the increasing traffic by repairing and improving the existing roads and bridges because the improvement of railway, inland water and coastal marine transportation suitable for inter-city mass transportation (passenger and cargo) was delayed and the improvement of metropolitan public transportation was also left behind.

The Mekong Delta Region plays a role as a major production area of agriculture, forestry and fishery for the whole of Viet Nam. Promoting both agricultural development and rural industry was indispensable to sustainable economic development making good use of its regional characteristics. In turn, this required the expansion of the market, keeping products fresh, and the promotion of smooth logistics by improving the infrastructure of transportation.

Can Tho City plays a role as a central city of the Mekong Delta Region. The construction of Can Tho Bridge enabled the direct connection of Can Tho to Ho Chi Minh City, Viet Nam's largest economic city, via National Highway No. 1. Accordingly, it became a requirement for economic growth whether each area in the Mekong Delta could build an efficient transportation network with Can Tho. To do so, it was an urgent challenge to overcome dependence on the conventional type of small-scale logistics by small ship on the waterway and to make transportation cost efficient by establishing a road network and securing a means of smooth mass transportation by truck, etc.

At the time of the ex-post evaluation, pre- and post-project economic growth (GDP) in this region (from 2003 to 2013) is 15% to 25% per year. The share of the Mekong Delta Region including the project area in the whole Vietnamese economy is as significant as 16.5% (2007)[3].

As shown in Table 1, rice and cultivation of prawns are still major products in the Mekong Delta Region and showed a great increase in output after the start of this project. Looking at

[3]Source: JETRO Ho Chi Minh Office (Business Information 2013: The Suburbs of Ho Chi Minh, Viet Nam)

changes in the exports of all goods from the region in recent years, there was a substantial increase in value of goods and necessity for efficient mass transportation remained unchanged. There are hopes for a road network to facilitate more economic development in the future. For development, regional industry should be promoted by exporting major products. After the completion of this project, the export of all goods, including the major products, namely rice and prawns, achieved increases by value of goods. That is why people still expect more and quicker transportation in the section of National Highway No. 1 in the project area, including the bridges involved. As evidence for their expectation, the road-widening work is under way in accordance with the scheme "Build, Operate and Transfer" (BOT[4]) by own responsibility of Viet Nam side in Public Private Partnership on the roads covered by this project. Thus, there remain high development needs for improving National Highway No. 1 in this region.

Table 1: Changes in Rice and Prawn Output

Unit: thousand tons

	Rice			Cultivation of Prawn		
	2003 Start of Project	2013 One Year after Completion	Increase/ Decrease Rate (%)	2003 Start of Project	2013 One Year after Completion	Increase/ Decrease (%)
Total of Coverage Area	3,742	6,363	Increase of 70%	139	339	Increase of 143%

Source: Statistical Yearbook of General Statistics Office, 2014

3.1.3 Relevance to Japan's ODA Policy

At the time of the appraisal in 2003, support was provided mainly for improving infrastructure as the JICA's ODA policy. Transportation was one of the most important sectors of support, along with power sector under Country Assistance Strategy for Viet Nam. Japan offered ODA loan of about 202.5 billion yen (about 30% of the approved total) in total from 1993 to 2001 for roads and bridges in the transportation sector.

At the time of the appraisal of Phase II, *Japan's Country Assistance Policy for Socialist Republic of Viet Nam (July 2009)* and *JICA Country Assistance Strategy for Socialist Republic of Viet Nam (April 2009)* regarded the establishment of a highway network as one of the main features of their support in the "establishment of networks of urban development, transportation and communications" stated as critical issues in both the plan and the policy. This project to construct a specific section of National Highway No. 1 running through the country was positioned as a program for upgrading the highway network.

As mentioned above, at the time of the appraisal, it was recognized that the project was relevant to Japan's ODA policy.

[4]A sort of public-private joint venture. It means that roads and bridges will be constructed on private funds and operated by private companies for a period of time. Their ownership will be transferred to the government when the contract with the government expires.

3.1.4 Relevance to Appropriateness of Project Planning and Approach

At the time of the appraisal, this project was planned to cover 17 bridges, including Tra Kha Bridge, which was, however, a project targeted simultaneously by two organizations, namely JICA and the World Bank (WB). As a target of the WB, the project had already received a budget and had been started. That is why the WB came to support the project in consideration of the urgency and efficiency of the needs for rehabilitating Tra Kha Bridge. As a result, a budget which had already been secured by JICA for Tra Kha Bridgewas re-allocated to the rehabilitation of the remaining 16 bridges in this project. With regard to this transfer of project target, an agreement was made between the Vietnamese government and JICA on the exclusion of the transfer from this project in August 2004 after the consultation between the Ministry of Transport of Viet Nam and JICA by way of an official letter (document) in July 2004.

The transfer of Tra Kha Bridge to the WB project is appropriate because the support of JICA overlapped with that of the WB and necessary procedures were properly followed, including the consultation between the executing agencies of both projects within the Ministry of Transport of Viet Nam, the final request from the Vietnamese government, and the agreement with JICA on the transfer of Tra Kha Bridge to the WB project.

At the time of the ex-post evaluation, it was confirmed that a new national road was provided close to the project road and road-widening work was performed on the project road in accordance with the BOT scheme. In the coverage area of this project, a national road for direct connection between Quan Lo and Phung Hiep was provided in 2008 in order to facilitate logistics from Ca Mau Province to Ho Chi Minh City. A total of three BOT projects were planned and carried out in the coverage area of this project. Road-widening work is under way to make a total of four lanes with two lanes on each side on the whole stretch from Can Tho City to Ca Mau Province. Construction on all three BOT projects was launched from 2014 to 2015 and operation partially started in February 2016. With regard to these new national road construction and BOT projects, their planning and the necessity for them could be neither confirmed nor predicted at the beginning of this project. The plans for Phase I and II were appropriate because they took into consideration the circumstances of this project at the time of the appraisal.

In light of the above, the importance of National Highway No. 1 is still high in the Mekong Delta Region as this project area from the standpoint of the Vietnamese government policy. Development needs remain high because a parallel road was developed in a part of the section covered by this project and road-widening work in the BOT project is performed on the whole line in the section. Besides, as it is confirmed that this project is consistent with Japan's ODA policy, this project has been highly relevant to Viet Nam's development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating:①)

3.2.1 Project Outputs

Bridge Rehabilitation Work

This project was initiated to secure smooth road transportation in the Mekong Delta Region and carry out the rehabilitation and replacement of 17 bridges in the section between Can Tho and Ca Mau (176km). Subsequently, Tra Kha Bridge was transferred to the WB because of overlapping with the WB project. The reason and process for the transfer of Tra Kha Bridge to the WB are described in 3.1.4 above. Finally, it was determined that this project would cover the rehabilitation and replacement of 16 bridges in the section between Can Tho and Ca Mau. At the time of the appraisal of Phase I, it was assumed that 17 bridges would be rehabilitated on the Japanese ODA loan. In fact, however, nine of those bridges which ranked high in priority were covered by the ODA loan, while seven bridges were constructed with Viet Nam's own funds. Table 2 shows the actual outputs of this project.

Table 2: Planned and Actual Outputs (Bridges)

	Plan (at the time of the appraisal of Phase I)	Actual	
	ODA loan (17 bridges)	ODA loan (9 bridges)	Viet Nam's Own Funds (7 bridges)
Can Tho City*	Dau Sou Bridge, Cai Rang Bridge, Nang Mao Bridge, Phung Hiep Bridge	Dau Sou Bridge, Cai Rang Bridge	—
Hau Giang Province*		Nang Mao Bridge	Phung Hiep Bridge
Soc Trang Province	Kinh Xang Bridge, Nhu Gia Bridge, Phu Loc Bridge, Khanh Hung Bridge	Kinh Xang Bridge, Nhu Gia Bridge, Phu Loc Bridge	Khanh Hung Bridge
Bac Lieu Province	Gia Rai Bridge, Noc Nang Bridge, Ho Phong Bridge, Xa Bao Bridge, Cai Day Bridge, Dan Xay Bridge, Xom Lung Bridge, Lan Tron Bridge, Tra Kha Bridge (**)	Gia Rai Bridge, Noc Nang Bridge Ho Phong Bridge	Xa Bao Bridge, Cai Day Bridge, Dan Xay Bridge, Xom Lung Bridge, Lan Tron Bridge

Source: Data from JICA

*Can Tho Province was divided into Can Tho City and Hau Giang Province in 2004.

**Tra Kha Bridge was excluded from the coverage of this project during the project period.

With regard to bridges, the scope of work was changed from the initially planned 17 bridges to 16 bridges. The reason for that change was confirmed by the field survey and interviews with the executing agency. It was done in order to avoid overlapping with the WB project, and procedures for the change were properly followed. Accordingly, the rehabilitation and replacement of 16 bridges were carried out according to plan.

Consulting Service

For consulting service on 16 bridges in this project, it was planned to hire International Consultant (85MM). Without any change to the plan made at the time of the appraisal of Phase I, the International Consultant performed its duties, including detail design review, tender assistance, construction supervision, training of engineers from the executing agency, training of managers, review of the resettlement plan, assistance in carrying out the plan, monitoring,

follow-up of the post-resettlement situation, support for environmental measures and formulation of traffic safety activities.

Approach Roads and Related Equipment

It was confirmed by the field survey and interviews with the executing agency that related equipment, including approach roads and traffic signs, were implemented as planned at the time of the appraisal of Phase II in 2010. Sites for replacing the bridges of Ho Phong and Nhu Gia have been changed from the time of the feasibility study (F/S) conducted by the Vietnamese government in 2002. At the time of the detail design, the specifications needed to be reconsidered. The executing agency changed the specifications by downgrading the specifications of approach road pavement without extreme decline of their performance. This change to the specifications of approach roads, being made under limited conditions, was proper because the problems of pavement scraping and warping are not found even at the time of the ex-post evaluation.

Thus, despite the change to the source of funding, outputs themselves were produced almost as planned with such minor changes as the exclusion of Tra Kha Bridge from the scope of work. Changing the specifications of approach roads was an appropriate measure for efficiency.

3.2.2 Project Inputs

3.2.2.1 Project Cost

In comparison of project cost between planned and actual values, the budget of 79 million yen for Tra Kha Bridge transferred to the WB was deducted from the amount in Phase I in order to determine the planned value. Although the total cost of this project was initially 6,652 million yen, the total after deducting the cost of Tra Kha Bridge was 6,573 million yen. The actual project cost became 10,701 million yen (excluding the portion of Tra Kha Bridge). Of the cost, the ODA loan covered a total of 5,490 million yen, while the Vietnamese government bore 5,217 million yen.

Table 3: Planned and Actual Project Cost

Unit: Million yen

Item	Plan At the time of the appraisal of (Phase I) 2002			Actual (as against plan) At the time of Ex-post Evaluation2016		
	Total	ODA Loan	Viet Nam's Own Funds	Total	ODA Loan	Viet Nam's Own Funds
Construction Works	3,706	3,706	0	7,143 (192%)	4,665 (125%)	2,483 (all increase)
Auditing Services for Procurement Procedure	0	0	0	0	0	0
Consulting Service	494	494	0	596 (120%)	596 (120%)	0
Price Escalation	141	141	0	0	0	0
Contingency	393	393	0	3(0%)	0	3 (all increase)
Interest During Construction	200	200	0	226 (113%)	226 (113%)	0
Commitment Charge	0	0	0	2 (all increase)	2 (all increase)	0
Land Acquisition Cost	795	0	795	2,653 (333%)	0	2,653 (333%)
Administration Cost	633	0	633	76(12%)	0	76(12%)
Tax (Value Added Tax &Tariff)	211	0	211	0	0	0
Total	6,573	4,934	1,639	10,701 (162%)	5,490 (111%)	5,217 (318%)

Source: The executing agency

Note: The exchange rate at planning was 1VND =0.00788 yen. Actual rates are the average rates (1VND =0.0057 yen) from 2003 to 2013 according to International Financial Statistics; Yearbook (IMF).

The total amount may not match because of the rounding down of numbers.

For this project, additional funds were required after the start of the project. That is due to an excessive rise in construction costs[5] (192%) caused by price escalation of materials during the project period and an increase (333%) in land acquisition costs following an increase in the number of affected households (for details, see Table 12). The extension of the project period also caused a slight increase in the cost for consulting service.

In response to the above-mentioned situation, the Vietnamese government decided to construct seven out of the 16 bridges covered by this project on its own funds. The investment by its own funds was a measure that the Vietnamese government took in order to prevent a delay that might be caused by financial difficulty.

The actual total cost of this project is significantly higher than planned (162%) and the portion covered by the ODA Loan is higher than planned (111%).

[5]On the assumption that the value at the time of signing the construction contract is 100, the indicators of rise factors of construction work as of August 2009 are as follows: 320.98 for labor costs, 168.52 for fuel costs, 173.80 for steel costs, 186.93 for cement, 271.56 for stone materials, 218.70 for sand, 175.31 for asphalt, and 168.23 for soil.

3.2.2.2 Project Period

At the time of the appraisal, the project period was planned to be from March 2003 (signing of Loan Agreement) to June 2007 (four years and four months, i.e., 52 months). Subsequently additional funds were extended, and it was planned at the time of the appraisal of Phase II that this project would be considered completed when the use of 16 bridges started (February 2011; 96 months). The starting year/month of using the bridges in this project is shown in Table 4. The actual completion of this project, which was in July 2011 (eight years and five months; 101 months), took 94% longer than the plan made at the time of the appraisal of Phase I.

Table 4: Starting Year/Month of Using Bridges

Construction Work	Starting Year/Month of Use
Package 2a (3 bridges on ODA Loan)	April 2011
Package 2b (7 bridges on Vietnamese funds)	April 2011
Package 2c (6 bridges on ODA Loan)	April 2011 (4 bridges) July 2011 (2 bridges)

Source: The executing agency

This project took 101 months in total and 49 months longer than the plan for the following reasons:

- It took eight months longer than planned to evaluate the bidder because three companies that applied for consulting service and passed the pre-qualification set up a joint venture by forming themselves into one consortium after the start of this project.
- The detail design of approach roads to the bridges of Ho Phong and Nhu Gia was changed and it took more time to redesign.
- Upon the selection of a contractor, the bid price exceeded the planned price and the tender failed. It took much time to coordinate with the company that bade the lowest price on determining which bridge should be covered by the ODA Loan and which bridge should be covered by Vietnamese government funds. As a result, the detail design was delayed seven months and the selection of a contractor was delayed 13 months owing to the splitting of the work package.
- The land acquisition required for this project was expanded in scale. In the F/S conducted by the Vietnamese government in 2002, information was not sufficiently collected on the assumption that the detail design should be made after the start of this project and a report was prepared on the basis of limited and less reliable information. The extension of the project period is attributable to the less reliable F/S report. Regarding the expanded land acquisition and the subsequent delay, there was the distinction of mandate between the executing agency as a provider of funds for land acquisition and the Compensation Committee as a negotiator with the households subject to resettlement. The executing agency could take only a limited measure to avoid a delay although it made an internal adjustment for smooth land acquisition.

- The contractor had financial difficulty because the parent company was unable to give adequate financial assistance for escalation in the prices for materials and machines. It also took much time to negotiate the price of contract and resulted in a delay of up to 15 months in construction work.

To cope with the delayed work, the remaining work of a contractor that made less progress in construction due to their worsened financing was partially entrusted to another contractor. In addition, Project Management Unit No. 2 (PMU2) and the JICA Viet Nam Office reinforced monitoring in order to make up for the delay. JICA identified problems and considered countermeasures in the interim supervision survey (conducted in September 2009). As for the six bridges with delayed construction work, JICA and the executing agency adopted the domestic competitive tender system according to the JICA procurement guidelines. They also strived to make construction work more efficient by shortening the time for selecting contractors. Nevertheless, the actual project period was significantly longer than planned (194%).

3.2.3 Results of Calculations of Internal Rates of Return (Reference only)

Table 5 shows the economic internal rate of return (EIRR).

Table 5: Comparison of Economic Internal Rate of Return
(at the Time of the Appraisal and the time of Ex-Post Evaluation)

At the time of the appraisal		At the time of Ex-Post Evaluation	
EIRR:	12.8% (Data from JICA)	EIRR:	15.7%
Benefit:	Driving-cost-reducing effect	Benefit:	Driving-cost-reducing effect
	Driving-time-reducing effect		Driving-time-reducing effect
Cost:	Operating costs (tax exclusive)	Cost:	Operating costs (tax exclusive)
	Management & maintenance costs		Management & maintenance costs
Project life:	25 years	Project life:	25 years

EIRR became 15.7% as a result of recalculation at the time of the ex-post evaluation (2016), which is higher than 12.8% calculated at the time of the appraisal. This is because an increase in traffic at the time of the ex-post evaluation over the level expected at the time of planning enhanced the driving-cost-reducing effect. When the above-mentioned calculation was made, the WB project (for one bridge) was included in operating costs at the time of the appraisal but excluded from the costs at the time of the ex-post evaluation. This has no significant effect on the increase of EIRR.

In light of the above, both the project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is low.

3.3 Effectiveness (Rating:③)

3.3.1Quantitative Effects (Operation and Effect Indicators)

The Annual Average Daily Traffic (AADT) (Passenger Car Unit, PCU) and reduction in the required time were used as indicators to measure quantitatively the operation and effect of this project. Setting 2002 as a base year of the time of the appraisal, the results of comparison between target at the time of appraisal one year after the completion of this project (2008) and actual values in 2013 one year after the completion of this project are shown in Table 6.

Target figures of AADT as of 2008 were calculated by taking the growth rate estimated through a similar survey in Viet Nam at the time of F/S into consideration. According to the result of the F/S, the growth rate of AADT for Viet Nam nationwide was estimated 1.2 to 1.8 times above GDP growth rate, and the growth rate of AADT of this project section was set as 1.5 times above GDP growth rate. As the GDP growth rate in Viet Nam in 1997 was 8.8%, the GDP growth rate in 2008 was set as 9%. The target figures of this project were set by considering the estimated growth rate, which was 13.5% (source: F/S report). With regard to AADT after the completion of this project, Can Tho showed a rapid increase above estimated growth rate (annual average growth rate from 2002 until 2013 was 19.09%) and other spots also achieved the targets. According to data from JICA, increases in traffic during the project period (from 2002 to 2009) were as gradual as 93% in Can Tho, 81% in Soc Trang, 109% in Bac Lieu and 82% in Ca Mau. Reductions in the travel time are 30 minutes, 45 minutes and 40 minutes in the sections between Can Tho and Soc Trang, Soc Trang and Bac Lieu, and Bac Lieu and Ca Mau, respectively as shown in Table 7. The traffic in Can Tho and Soc Trang one year after the completion of this project showed significant increases of 560% and 180% respectively, exceeding the targets, while the travel time in the section involved was reduced by only 66%. In Soc Trang and Bac Lieu, the traffic showed substantial increases of 180% and 140%, respectively exceeding the targets, while the travel time in the section involved was reduced by 81%.In Ca Mau, the traffic showed increases of 140% and over 100%, respectively, while the travel time in the section involved was significantly reduced by 160%. It was assumed that actual AADT in Can Tho exceeded much more than the target figure because GDP growth rate of Can Tho used as basis for the estimation increased far more than that of the national level or that of the project area as shown in Table 10.

Table 6: Planned and Actual Annual Average Daily Traffic

Annual Average Daily Traffic Unit (PCU/day)	Baseline	Target	Actual (Annual Average Growth Rate)	Actual
	2002	2008	2013	2014
	Year of Appraisal	1 Year after Completion	1 Year after Completion	2 Years after Completion
Can Tho	9,319	11,265	63,683（19.09%）	-
Soc Trang	6,250	11,321	20,596（11.45%）	22,903
Bac Lieu	6,238	13,053	18,575（10.43%）	21,112
Ca Mau	9,370	17,084	18,605（6.43%）	21,113

Source: PMU2

Table 7: Planned and Actual Reductions in the Travel Time

Reduction in Required Time (time) (Note 1)	Baseline	Target	Actual	Actual
	2002	2008	2013	2014
	Year of Appraisal	1 Year after Completion	1 Year after Completion	2 Years after Completion
Can Tho–Soc Trang	1h & 45min	1h (45min reduced)	1h & 15min (30min reduced)	1h & 15min (30min reduced)
Soc Trang – Bac Lieu	1h & 45min	50min (55min reduced)	1h (45min reduced)	1h (45min reduced)
Bac Lieu – Ca Mau	1h & 55min	1h &30min (25min reduced)	1h & 15m (40min reduced)	1h & 15min (40min reduced)

Source: Survey by interview (Note 2).
(Note 1) Despite the expression "reduction in the travel time," the actual baseline value is the travel time itself.
(Note 2) Relevant agencies, including the executing agency, did not conduct a survey on the required time and there are no official statistical data. Therefore, data were obtained from interviews with long-distance bus companies that have rendered service in the section covered by this project since before the start of this project.

3.3.2 Qualitative Effects (Other Effects)

It is fair to say that the qualitative effect of this project is the improvement of safety and convenience of National Highway No. 1. As a result of interviewing beneficiaries at the time of the ex-post evaluation in order to confirm the qualitative effect, the improvement of safety and convenience of the bridges involved to a certain extent was confirmed.

3.3.2.1 Outline of the Beneficiary Survey

A survey was carried out by interviewing beneficiaries in this project with a questionnaire[6].

(1) Bridge Users: The profile of respondents is as follows:

- Average Age: 42.61 years old

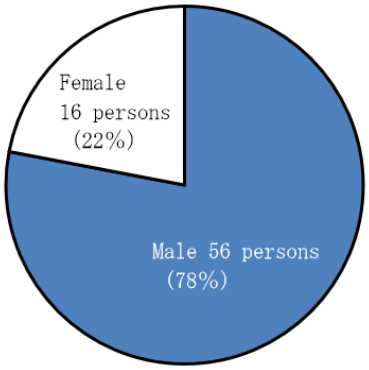


Figure 1 Gender of respondents

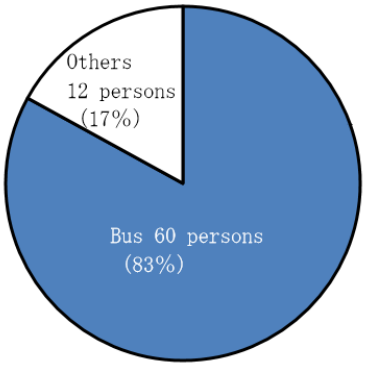


Figure 2 Means of transportation in use

Note: Total number of percentage may not be 100% due to rounding off.

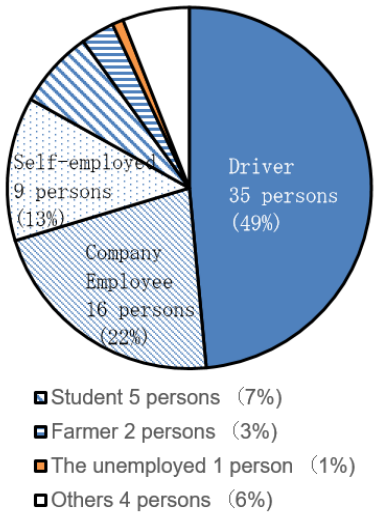


Figure 3 Occupation of respondents

(2) Residents along the Highway: The profile of respondents is as follows:

- Average Age: 48.25 years old

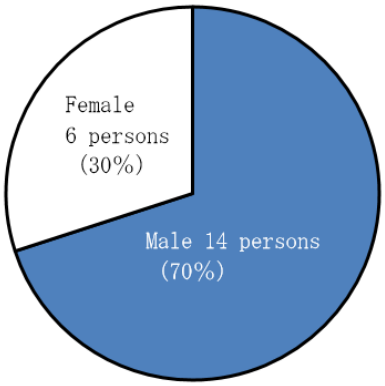
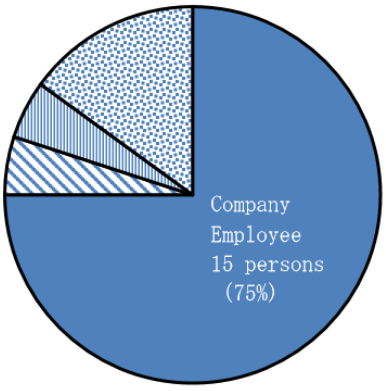


Figure 4 Gender of respondents



Government officer 1 person (5%)
Driver 1 person (5%)
Others 3 persons (15%)

Figure 5 Occupation of respondents

[6]As a complementary means to grasp the project effects, a survey was conducted by interviewing (1) bridge users (72 people), (2) residents along the highway (20 people) and (3) companies along the highway (11 companies) using a questionnaire. When users were sampled, passengers getting on the long-distance buses from the long-distance bus terminals in Can Tho City and Ca Mau Province were interviewed by the interviewer getting on the bus together with them. Of all the bridges covered by this project, residents living near the seven bridges which are large-scale and in the neighborhoods with commercial facilities and tourist spots (the bridges of DauSou, CaiRang, Phung Hiep, PhuLoc, DanXay, Xom Lung andNoc Nang) were chosen for this survey. Companies along the highway introduced by the Vietnamese Ministry of Transport were chosen for this survey, including four companies that run transportation businesses (one each from the city and three provinces involved) and seven other business types (three from Can Tho City, two from Soc Trang Province and two from Bac Lieu Province).

(3) Companies along the highway: The profile of respondents is as follows:

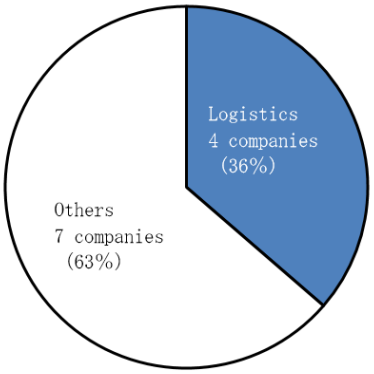


Figure 6 Business industry of responded companies

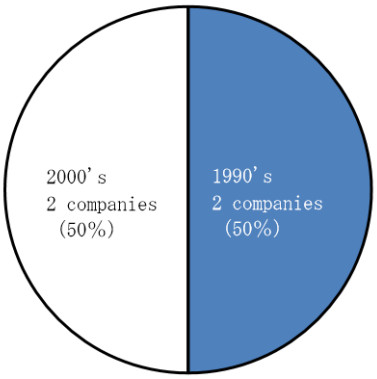


Figure 7 Year of establishment (Logistics company)

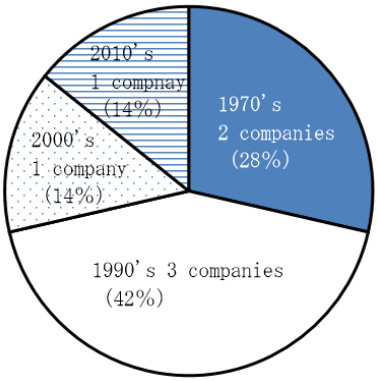


Figure 8 Year of establishment (Others)

Note: Total number of percentage may not be 100% due to rounding off.

3.3.2.2 Improvement of Safety

Table 8 shows the number of recent traffic accidents on National Highway No. 1. Since bridges were rehabilitated and the pavement of the road was improved thanks to this project, no car accident has occurred on the bridges involved in the period from 2014 up to now, as of the ex-post evaluation. According to the survey on project beneficiaries, 61% of bridge users (including long-distance bus users and the employees of companies along the highway who drive their cars on the road with the bridges involved) replied that traffic accidents decreased because the renewed bridges had better driving conditions.

Table 8: Number of Traffic Accidents in the Section Involved of National Highway No. 1

		2014	2015	January–June 2016
Can Tho–Soc Trang	Accidents	56	58	70
	Tolls	13	23	10
	Injuries	76	85	97
Soc Trang – Bac Lieu	Accidents	108	80	50
	Tolls	25	9	8
	Injuries	171	140	93
Bac Lieu – Ca Mau	Accidents	45	81	34
	Tolls	7	7	4
	Injuries	105	186	60

Source: Directorate for Roads of Viet Nam

However, pedestrians who forcibly tried to cross near the bridge got involved in car accidents because there was no pedestrian safety fence on the bridge at the time of project completion. In fact, residents along the highway (mainly pedestrians) who reported a decrease in traffic accidents on the survey accounted for no more than 20% (Table 9). Subsequently, however, it was confirmed by interviewing residents along the highway that the installation of a pedestrian safety fence by the provincial government led to a reduction in accidents.

Table 9: Results of the Beneficiary Survey on Changes in the Number of Traffic Accidents

Reply	Bridge Users		Residents	
	Respondents	%	Respondents	%
Accidents increased	21	29	10	50
Accidents decreased	44	61	4	20
I don't know	7	10	6	30
Total	72	100	20	100

3.3.2.3 Improvement of Convenience

All eleven companies along the highway that were interviewed in the beneficiary survey replied that they benefitted from this project, and six of them replied that the driving costs decreased. Moreover, two companies replied that they were able to use larger vehicles than before, transport a large volume of cargo at once and reduce the cost of transportation to final destinations such as Ho Chi Minh. Thus, it can be judged that this project has improved convenience.

At the time of the appraisal, this project, regarding logistics, aimed to shift the means of transportation from small inland water transportation to large land transportation. Thus, the beneficiary survey tried to grasp the actual situation. As a result of the survey, it was confirmed that progress was made in the shift of means from inland water to land transportation because the vast majority of respondents (82% of bridge users and 90% of companies along the highway) replied that the shift from small inland water transportation to large land transportation (changes in the cases of transportation and the volume of logistics) showed "a large increase" after the completion of this project.

Thus, actual traffic exceeded the target to a remarkable extent in this project. The required travel time might have been reduced to a greater extent if traffic had been as planned for the section involved. In this respect, it seems reasonable that reductions in the travel time in the sections where actual traffic remarkably increased were limited to 66% and 81%, respectively. In addition, it can be judged that this project had brought sufficient effects when taking into consideration of its positive effects on the improvement of safety and convenience.

3.4 Impacts

3.4.1 Intended Impacts

The expected impact of this project is “promotion of economic growth and reinforcement of international competitiveness.” The realization of the impact on “promotion of economic growth” and “reinforcement of international competitiveness” is as follows:

3.4.1.1 Promotion of Economic Growth

The GDP of the project area showed a high increase of 14% to 23% on annual average for ten years from 2003 to 2013 as shown in Table 10. The project area exceeds the average of Viet Nam as a whole. Eleven companies along the highway which were interviewed in the beneficiary survey replied that the infrastructure of logistics, including warehouses and gas stations, improved after the start of this project. Also, shops opened along the highway, which enabled them to secure sites for selling the specialties of the project area to those who use National Highway No. 1. Thus, the implementation of this project seems to have had a certain effect on the economy of the project area.

Table 10: Changes in Pre- and Post-Project Economic Growth in the Project Area

Unit: billion VND

	2003	2013	CAGR (%)
Can Tho	9,408	77,811	23.52%
Hau Giang	NA (before separation)	21,233	NA
Soc Trang	7,419	40,162	18.40%
Bac Lieu	5,667	30,417	18.30%
Ca Mau	8,871	34,595	14.58%
Whole Project Area	31,365	204,218	20.60%
Whole Viet Nam	613,442	3,584,261	19.31%

Source: Statistical Yearbook of General Statistics Office, 2014

3.4.1.2 Reinforcement of International Competitiveness

In case rice and prawn productions are compared before and after this project in the project area on a provincial basis, they are generally increasing (See Table 1). Because of lack of information, it cannot be judged how much of the increased production was exported. According to Table 11, however, it is presumable that international competitiveness was reinforced by two factors: improvement in trade conditions following mass production and the decrease in driving costs. This is based on a substantial increase in the amount of all exported goods in the project area in 2014 compared with the previous year, although a temporary decrease is seen in 2015. It seems that this decrease is temporary because some sections of the project road were under construction under BOT projects in 2015. The operation of these sections started in February 2016 and the amount of exports in the project area is expected to increase.

Table 11: Changes in the Amount of Exports in the Project Area

Unit: million dollars

	2013	2014 (as against previous year)	2015 (as against previous year)
Can Tho	1,252	1,239 (-1.0%)	1,175 (-5.1%)
Hau Giang	181	336 (+85.6%)	379 (+12.7%)
Soc Trang	519	656 (+26.3%)	533 (-18.7%)
Bac Lieu	497	692 (+39.2%)	477 (-31.0%)
Ca Mau	1,103	1,370 (+24.2%)	968 (-29.3%)

Source: General Department of Viet Nam Customs

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

At the time of the appraisal of Phase I, this project was classified into Category B. This is because an adverse effect of this project on the environment was judged not to be serious because this project aimed to rehabilitate bridges and the project area of this project was an area where a remarkable environmental impact was not characteristically foreseeable in light of the *JBIC Guidelines for Environmental Consideration in Japan's ODA Loan* (formulated in October 1999). According to the *International Cooperation Bank Guidelines for Confirming Environmental and Social Consideration* (formulated in April 2002) as guidelines adopted to appraise Phase II, this project can be classified into the road sector and into Category A because it is characteristically influential. However, it was determined that the 1999 guidelines adopted to appraise Phase I should also be applied to Phase II because there was no significant change to the scope of work.

When Phase I was appraised, there was a concern about air pollution, noise and water contamination. Necessary countermeasures were required (F/S report) during the implementation of this project. When Phase II was appraised, consideration was given to meeting the environmental standards of Viet Nam by taking the required measures to dispose of waste and to prevent water contamination under the supervision of consultants during the construction and at the time of handing over of the bridges from the contractor to the implementing agency.

It was confirmed by interviewing the executing agency and checking the progress report that environmental monitoring was performed by the consultant in charge of supervision during the implementation of this project. The monitoring system was operated as follows: PMU that should supervise the implementation of this project on the whole gave guidance to the contractor through the person from the executing agency in charge of the project site, and the contractor carried out monitoring at the site and reported to PMU every month. Environmental mitigation measures were carried out by the contractor according to plan, including the prevention of water contamination by using the filtration system and the adjustment of working time and construction equipment as described below. Waste disposal and the prevention of water contamination and noise during the construction were properly monitored. Waste was hardly

emitted thanks to efforts to reuse it as far as possible. Water deterioration by drainage was confined by filtration to a tolerable extent, while efforts were made to minimize drainage. Noise and vibration were also confined to a tolerable extent because they were mitigated by suspending construction work after four o'clock in the evening until six o'clock in the early morning and by using centrifugal reinforced concrete posts.

Regarding impacts on the natural environment, proper monitoring was carried out during the implementation of this project, and no negative impact in particular was found.

3.4.2.2 Land Acquisition and Resettlement

When this project was appraised, land acquisition was required for 1,646 households and 175 households were required to be resettled as shown in Table 12. In the end, 1,989 households were subject to land acquisition and 277 households were resettled. According to the executing agency, the reason for the number of resettled households increased from 175 to 277 is that the number of households to be resettled at the time of planning was just a reference, and it increased when the detailed plan was formulated after the start of this project. As a result, the whole process was significantly delayed. At the time of the appraisal, it was planned that land acquisition and resettlement should have been completed by May 2005. In fact, the payment of compensation to residents affected by land acquisition was completed in December 2009 and the resettlement was completed in April 2011 after an adjustment was made for residents who lodged an objection against the resettlement.

Procedures for land acquisition and resettlement were followed in accordance with JICA's environmental and social consideration guidelines along with the master plan for resettlement of residents that was prepared by the executing agency under the domestic laws of Viet Nam. Residents subject to resettlement were entitled to file a complaint to the county compensation committee about the decision on resettlement by the Compensation Committee, such as the assessed price of land. Moreover, if they had objected to the response of the county compensation committee, they could have requested the provincial compensation committee to solve the dispute. According to interviews with the resettled residents, they actually lodged an objection, which was treated properly under the domestic laws and resolved finally in such a way as to satisfy them.

Table 12: Households Subject to Land Acquisition and Resettlement

Unit: household

	Land Acquisition Households (Plan)	Land Acquisition Households (Actual)	Resettled Households (Plan)	Resettled Households (Actual)
Can Tho	138	391	175	187
Hau Giang	233	323	0	90
Soc Trang	359	359	—	—
Bac Lieu	916	916	—	—
Total	1,646	1,989	175	277

Source: PMU2

As a result of the interviews with the resettled residents, negative effects of this project were not found because they were resettled to places near their former houses and the Compensation Committee carefully dealt with their complaints about compensation (e.g. a complaint about the certification of compensation coverage). Twenty residents who lived along the highway became subjects of the survey. Sixteen of them were subject to land acquisition and eight out of those 16 were resettled. Of residents along the highway, five people (25%) got new jobs after the start of this project and 15 people (75%) did not change their jobs.

As a result of comparison with the target of traffic (PCU/day) set at the time of the appraisal of Phase I, PCU/day as a quantitative indicator achieved the target. The saving of the travel time was also generally good. The target was achieved judging from the travel time almost being kept despite the increasing traffic.

With regard to the qualitative effect, the results of the beneficiary survey show that convenience has improved. In the period from 2014 to the ex-post evaluation, there were no traffic accidents (vehicles or pedestrians) on the bridges involved. On the other hand, a few accidents occurred involving pedestrians near the bridges. As a countermeasure for such accidents, a pedestrian safety fence that this project could not cover was installed on the budget of the provincial government. Therefore, the situation was indirectly improved by the effort of relevant agencies although it was not the direct effect of this project.

As for impacts on economic growth and international competitiveness, this project had a certain impact as exemplified by a substantial increase in GDP despite some fluctuations in the amount of exports. There is no negative effect on the natural environment. Resettlement and land acquisition were carried out in compliance with domestic laws.

In light of the above, this project has largely achieved its objectives. Therefore effectiveness and impact of the project are high.

3.5 Sustainability (Rating:③)

3.5.1 Institutional Aspects of Operation and Maintenance

At the time of the appraisal, it was assumed that Viet Nam Road Administration (VRA) and Regional Road Management Unit No. 7 (RRMU7) would take charge of maintenance of this project. After that, the Directorate for Roads of Viet Nam (DRVN) reorganized from VRA, and Regional Management Bureau No. 4 (RMB4) reorganized from RRMU7 assumed the operation and maintenance of this project.

DRVN under the Ministry of Transport analyzes the managerial situation based on the annual report from RMB with the whole country divided into four regions and makes a maintenance plan for the approval of the authorities (the inspection of road administration and proposals on the mechanism and policy for road administration work). DRVN supervises the activities of RMB by directly making contact with the road maintenance site and promotes proper maintenance.

RMB is an agency that is directly responsible for road inspection, operation and maintenance. This bureau rearranges and renews data on the situation of roads and files related documents on a regular basis.

The practice of road operation and maintenance is assumed by the branch of RMB (Sub-RMB), which actually entrusts the work to contractors. The bridges covered by this project are operated and maintained by RMB4 under the supervision of DRVN. Sub-RMB5 and Sub-RMB6, as branches of RMB4, administer the work. Moreover, contractors to which Sub-RMB5 and Sub-RMB6 entrust the work take charge of the operation and maintenance of each bridge.

The organization of RMB4 in charge of the maintenance of this project has 52 staff members in total, along with three vice-directors under the director. It is composed of five divisions (general affairs, safety, maintenance, planning and accounting) and one office (inspection). Nearly 30 staff members are positioned in both Sub-RMB5 and Sub-RMB6 under the direct control of this bureau.

Maintenance work is carried out by DRVN, RMB4, Sub-RMB5, Sub-RMB6 and contractors, each of which makes regular reports and contact and has consultations daily, weekly and monthly at each level. In addition, 17 members or one third of the staff of RMB4 are engaged in maintenance and inspection; and almost all the members of Sub-RMB5 and Sub-RMB6 are engaged in road inspection. Thus, there is no institutional problem.

3.5.2 Technical Aspects of Operation and Maintenance

The skills of the maintenance personnel of DRVN, RMB and Sub-RMB are kept at a proper level by positioning those who learned engineering in colleges as staff members. In RMB4, Sub-RMB5, Sub-RMB6 and the contractor, staff members do not receive training in

maintaining and improving their technical level but human resources are developed by OJT through the daily work. As there are manuals on operation and maintenance which DRVN prepared, the staff members of RMB, Sub-RMB and the contractor perform operation and maintenance according to the manuals.

The skills of operation and maintenance are generally adequate because the staff members of RMB, its branches and the contractor have skills required for their jobs; in addition, manuals are available.

3.5.3 Financial Aspects of Operation and Maintenance

In Viet Nam, the maintenance costs of roads (including bridges) are covered by the budget for road maintenance that the Ministry of Finance allocates to the Ministry of Transport after approval by the Ministry of Planning and Investment. Specifically, DRVN reports a plan for road maintenance throughout the country to the Ministry of Transport. In response to the report, the Ministry of Transport presents a draft budget for planning maintenance to the Ministry of Planning and Investment. After the budget is finally approved by the Ministry of Planning and Investment, the Ministry of Finance will appropriate it.

The budget is allocated through the Ministry of Finance to DRVN under the Ministry of Transport and RMB and Sub-RMB under DRVN, all of which take charge of operation and maintenance. According to the interview with RMB4 in charge of this project, a necessary and minimum budget is secured at the time of the ex-post evaluation. The F/S report made a recommendation that "0.25% of the total construction cost should be applied to the maintenance costs". The cost of maintenance calculated from actual values (a total construction cost of 7,143 million yen for a total length of 2,540 m) is 7,030 yen per meter. The budgets for maintenance in 2013 and 2014 are 1,480,000 VDN (7,408 yen) and 1,430,000 VDN (7,119 yen), respectively, which are adequate for maintenance by RMB4. These budgets include extraordinary ones allocated in case of an emergency which requires maintenance and construction work.

Although information has not been obtained with reference to a mid- and long-term situation of budgeting, there is no problem for the time being because the maintenance budget has been so far secured and allocated at the level required at the time of the appraisal.

3.5.4 Current Status of Operation and Maintenance

When the maintenance of all 17 bridges including Tra Kha Bridge was checked at the time of the field survey, minor damages were detected, including broken parts of the drain, slight cracks in the outside walls, and cracks in the paved edges of the approach roads. However, these are not so serious as to hinder the operation. Maintenance required for operating the bridges (regular inspection and urgent or serious defect repairs) has been carried out.

Those minor damages were found on a total of seven bridges (Dau Sou, Cai Rang, Khanh

Hung, Dan Xay, Lan Tron, Gia Rai and Noc Nang). Three bridges (Kinh Xang, Xa Bao and Cai Day) were under widening work as a BOT project.

With regard to operation and maintenance, although lack of maintenance on minor damages which were unlikely to hinder bridge operation was found, damage which might seriously hinder bridge operation was repaired according to the interview with RMB4 and the field survey by the external evaluator. In this respect, the maintenance required for bridge operation is being carried out adequately.

In light of the above, no major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

National Highway No. 1 had not functioned well in the section between Can Tho and Ca Mau, owing to damage s from the Viet Nam War and subsequent inadequate maintenance. People had been forced to depend on inland water transportation for the greater part of logistics in the Mekong Delta Region. This project aimed to enhance the efficiency of road transportation by repairing and replacing bridges along the highway and thereby contributing to the economic growth of this region and help strengthen international competitiveness. Road development has been given higher priority in the development policy of the Vietnamese government from the time of appraisal up to the time of the ex-post evaluation. Development needs have remained high even at the time of the ex-post evaluation. The relevance of this project, which was confirmed to be in conformity with Japan's ODA policy at the time of the appraisal, is high. However, the efficiency of this project is low because the project cost was higher than planed and the project period was significantly longer than planned. The scope of work was changed from 17 bridges to 16 bridges because Tra Kha Bridge, one of the bridges covered by this project, was transferred to the WB project. This change in scope was proper in both substance and process. The operation and effect indicators set at the time of the appraisal have mostly achieved the targets and other positive impacts have also appeared to a certain extent. Therefore, the effectiveness and impact of this project are high. Road maintenance agencies, including DRVN, are well established and have sufficient experience and skills. The budget for road maintenance is secured at the level required at the time of the appraisal and an additional budget can be appropriated whenever required. Accordingly, there is no financial problem and the sustainability of this project is high at the time of the ex-post evaluation.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Design Emphasizing Safety Management

When this project was designed, a certain consideration was given to safety management, but a pedestrian safety fence was not included in the initial design. Near the bridge under specific conditions (the existence of commercial facilities and schools and a wide road for large traffic), many pedestrians got involved in traffic accidents on the approach road shortly after the completion of this project. If the installation of a pedestrian safety fence had been included in the initial design, unnecessary accidents could have been avoided. Therefore, as for bridges under such specific conditions as proximity to schools, houses and commercial facilities and a wide road (two lanes on each side), if a rapid increase in traffic is predicted or if residents in the neighborhood are likely to cross the bridges daily in a similar project in the future, safety measures, including the installation of a pedestrian safety fence, should be taken in the project.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	17 bridges (16 bridges *1)	16 bridges *1 As planned
2. Project Period	March 2003 - June 2007 (52 months)	March 2003 - July 2011 (101 months)
3. Project Cost Amount Paid in Foreign Currency	3,220 million yen	1,077 million yen
Amount Paid in Local Currency	3,432 million yen (435 billion VDN)	9,622 million yen (1,688 billion VDN)
Total	6,652 million yen (6,573 million yen *2)	10,701 million yen
Japanese ODA Loan Portion	5,013 million yen (4,934 million yen *2)	5,490 million yen
Exchange Rate	1 VDN = 0.00788 yen (As of March 2003)	1 VDN = 0.0057 yen (Average between March 2003 to July 2013)

*1 Tra Kha Bridge was properly transferred to the WB.

*2 The budget of 79 million yen for Tra Kha Bridge at the time of appraisal in 2002 was deducted upon evaluation.