Socialist Republic of Viet Nam

FY2017 Ex-Post Evaluation of Japanese ODA Loan Project

"Red River Bridge Construction Project (I) (II) (III) (IV)"

"Hanoi City Ring Road No.3 Construction Project"

External Evaluator: Masumi Shimamura,
Mitsubishi UFJ Research and Consulting Co., Ltd.

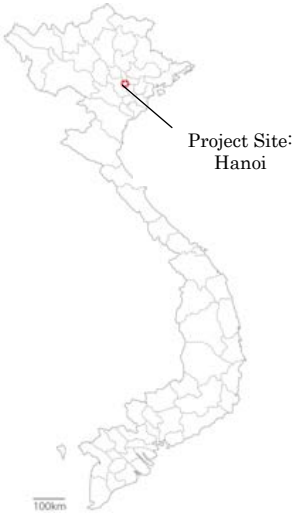
0. Summary

Both projects aimed to respond to the increasing traffic demands in Hanoi City and the surrounding areas through the construction of Red River Bridge, New Phu Dong Bridge and Phap Van Viaduct of the Hanoi City Ring Road No. 3 by "Red River Bridge Construction Project (I) (II) (III) (IV)", and through the construction of a road in the section between its intersection with National Highway No. 32 and the North of Linh Dam Lake by "Hanoi City Ring Road No.3 Construction Project". Both projects aimed at eliminating the bottleneck of road traffic in Hanoi City and improving logistics efficiency are consistent with the country's development policy, development needs as well as with Japan's ODA policy that set out support for economic infrastructure development. Therefore, the relevance of the projects is high. With regards to efficiency, it is judged to be fair when both projects are summed as one project. Regarding project effectiveness, when taking into account the analysis results on quantitative effects of both projects (for Red River Bridge Construction Project, the actual traffic volume was a little lower than 80% of the target value at one point, however, when considering that it is the traffic volume after the traffic was dispersed to other new bridges which were developed after the appraisal of the project, it can be regarded that the target has been sufficiently achieved. The actual result of time saving greatly exceeded the target values for all of the three measurement points. For Hanoi City Ring Road No.3 Construction Project, the actual traffic volume is slightly less than 80% of the target value, however, it is judged that it has achieved sufficiently when taking into consideration the results of hearings to beneficiaries. The actual result of time saving greatly exceeded the target value set at the time of appraisal) as well as results of interviews with beneficiaries, it can be considered that both projects are contributing to alleviating traffic congestion in Hanoi City and improving logistics in the northern part of Vietnam. In addition, impact that both projects contribute to the development of the regional economy by securing smooth road transport is also seen; thus, effectiveness and impact are high. No particular big problem has been reported on the impact on natural environment, and resettlement and land acquisition process has been properly implemented based on the relevant regulations in Vietnam and thus there is no problem. Regarding operation and maintenance, some minor problems have been observed in terms of the institutional aspect and financial aspect. Therefore, sustainability of the

effects generated by both projects is fair.

In light of the above, both projects are evaluated to be satisfactory.

1. Project Description



Project Location

Red River Bridge

1.1. Background

The roads of Hanoi City, the capital of Vietnam, have been pointed out so far problems such as lack of a road network, insufficient road width, and poor pavement, etc. Despite recognizing the importance of strengthening the function as the biggest city in northern Vietnam, the road network in Hanoi could not respond to the rapid increase of road traffic with rapid urbanization and motorization accompanying economic growth, in addition to the population increase. As a result, there were problems such as traffic jam, deterioration of traffic safety, air pollution, etc. At the time of project formulation, there were only three bridges in Red River which split Hanoi in two – Thang Long Bridge, Chuong Duong Bridge and Long Bien Bridge. Part of Long Bien Bridge was destroyed by the north bomb, and was supported by the temporary piers, and corrosion of the parts was progressing, so operation as it was dangerous. It was predicted that the other two bridges would face traffic volume far beyond their capacity in the future. In addition, traffic congestion in the city was getting worse due to increase in traffic volume flowing from the southern area and Hai Phong City to Hanoi City through National Highway No. 1 and National Highway No. 5. Furthermore, there were seven radiation trunk roads spreading around Hanoi City, however, since there was no outer ring road, traffic was concentrated in the center of the city including transit traffic and thus the traffic situation in the city was exacerbating. Through both projects, it was urgently needed to improve logistics efficiency by constructing a new

bridge to Red River and ring road to spread increasing traffic volume in Hanoi City and surrounding areas to both projects, and to alleviate traffic congestion in the City and surrounding areas.

1.2 Project Outline

The objective of the projects is to respond to increasing traffic demand in Hanoi City and surrounding areas, by constructing Red River Bridge, New Phu Dong Bridge and Phap Van Viaduct of Hanoi City Ring Road No.3 by "Red River Bridge Construction Project (I) (II) (III) (IV)", and by constructing a road in the section between its intersection with National Highway No. 32 and the North of Linh Dam Lake by "Hanoi City Ring Road No.3 Construction Project" of Hanoi City Ring Road No.3, which is an urgent issue for the improvement of road transport network of Hanoi City, thereby contributing to the economic development of the area.

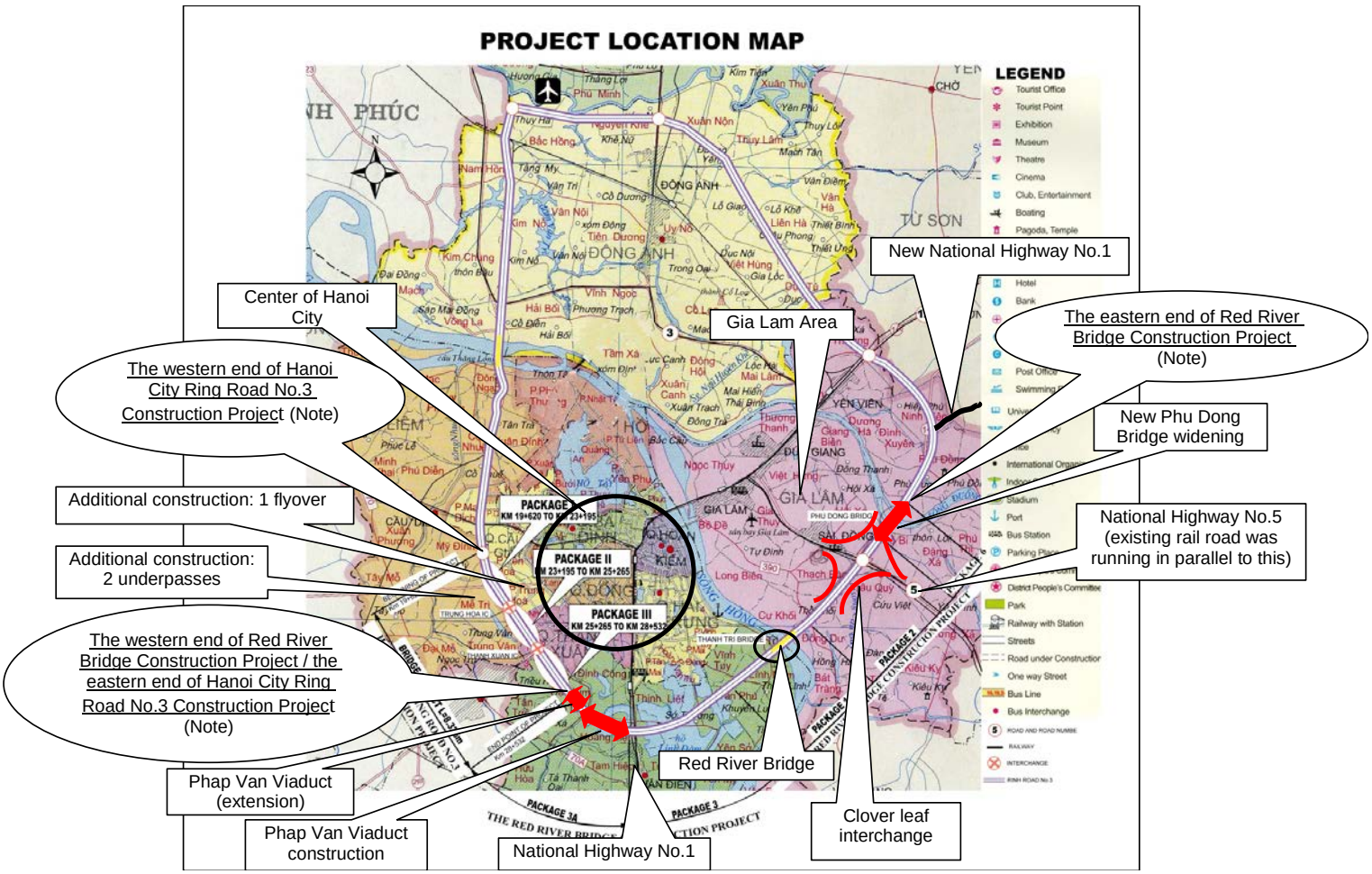


Figure 1: Project Location Map

Source: Prepared by the evaluator based on the information provided by executing agency

Note) The eastern end and the western end of the target section of each project are indicated by elliptical balloons.

Loan Approved Amounts/ Disbursed Amounts	・Red River Bridge Construction Project 10,000 million yen / 9,950 million yen (Phase I) 14,863 million yen / 13,775 million yen (Phase II) 2,415 million yen / 2,254 million yen (Phase III) 13,711 million yen / 13,172 million yen (Phase IV) ・Hanoi City Ring Road No.3 Construction Project 28,069 million yen / 22,741 million yen
Exchange of Notes Dates/ Loan Agreement Signing Dates	・Red River Bridge Construction Project March, 2000 / March, 2000 (Phase I) March, 2002 / March, 2002 (Phase II) March, 2004 / March, 2004 (Phase III) March, 2006 / March, 2006 (Phase IV) ・Hanoi City Ring Road No.3 Construction Project March, 2008 / March, 2008
Terms and Conditions	・Red River Bridge Construction Project Interest Rate: 1.8% (Phase I) 0.75% (Phase I consultant) 1.8% (Phase II) 1.3% (Phase III) 1.3% (Phase IV) Repayment Period: 30 years (40 years for Phase I consultant) (Grace Period: 10 years) Conditions for Procurement: General Untied (Bilateral Tied for Phase I consultant) ・Hanoi City Ring Road No.3 Construction Project Interest Rate: 1.2% 0.01% (consultant) Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General Untied
Borrower / Executing Agencies	・Red River Bridge Construction Project (I) (II) (III) (IV) The Government of the Socialist Republic of Vietnam / Ministry of Transport

	・Hanoi City Ring Road No.3 Construction Project The Government of the Socialist Republic of Vietnam / Directorate for Roads of Vietnam
Project Completion	・Red River Bridge Construction Project (I) (II) (III) (IV) May 2018[1] ・Hanoi City Ring Road No.3 Construction Project July, 2016[2]
Main Contractors (Over 1 billion yen)	・Red River Bridge Construction Project Package I: Obayashi Corporation (Japan) / Sumitomo Construction Co., Ltd. (Japan) (JV), Package II: Obayashi Corporation (Japan), Package III: Sumitomo Mitsui Construction Co., Ltd. (Japan) / Thang Long Construction Corporation (Vietnam) / Civil Engineering Construction Corporation No.8 (Vietnam) (JV), Package III A: Sumitomo Mitsui Construction Co., Ltd. (Japan) / Thang Long Construction Corporation (Vietnam) (JV), Package VI: Thang Long Construction Corporation (Vietnam) / Civil Engineering Construction Corporation No.4 (Vietnam) / Civil Engineering Construction Corporation No. 1 (CIENCO 1) (Vietnam) (JV), Package NH5: Thang Long Construction JSC (TLG) (Vietnam) / Civil Engineering Construction Corporation No.4 (Vietnam) (JV) ・Hanoi City Ring Road No.3 Construction Project Package 1: Samwhan Corporation (Korea) / Civil Engineering Construction Corporation No.4 JSC (Vietnam) (JV), Package 2: Sumitomo Mitsui Construction Co., Ltd. (Japan), Package 3: Civil Engineering Construction Corporation No.4 JSC (Vietnam) / Thang Long Joint Stock Corporation (Vietnam) / Civil Engineering Construction JSC 8 (Vietnam) (JV), Package NH6: Hanshin Engineering & Construction Co., Ltd. (Korea) / Civil Engineering Construction Corporation No.4 (Vietnam) (JV), Package Trung Hoa IC: Hanshin Engineering & Construction Co., Ltd. (Korea) / Civil Engineering Construction Corporation No.4 (Vietnam) (JV)

[1] At the end of warranty period after completion of construction of the additional scope of phase IV.
[2] At the time of construction completion including the additional scope.

Main Consultants (Over 100 million yen)	・Red River Bridge Construction Project (I) (II) (III) (IV) Oriental Consultants Global Co., Ltd. (Japan) ・Hanoi City Ring Road No.3 Construction Project Oriental Consultants Global Co., Ltd. (Japan) / Katahira & Engineers International (Japan) (JV)
Related Studies (Feasibility Studies, etc.)	・Red River Bridge Construction Project (I) (II) (III) (IV) - JICA Master Plan of Urban Transport for Hanoi City in Viet Nam (January, 1997) - JICA Development Study on The Feasibility Study on the Thanh Tri Bridge and The Southern Section of Ring Road No.3 in Hanoi in Socialist Republic of Viet Nam (September, 1998) ・Hanoi City Ring Road No.3 Construction Project - JBIC SAPROF on Hanoi City Ring Road No.3 Construction Project (July, 2007)
Related Projects	・Technical Cooperation - Development Study, The Feasibility Study on the Thanh Tri Bridge and The Southern Section of Ring Road No.3 in Hanoi in Socialist Republic of Viet Nam (1997-1998) - Development Study, The Detailed Design of the Red River Bridge (Thanh Tri Bridge) Construction Project in the Socialist Republic of Viet Nam (1999-2000) - Development Study, The Study on the National Transport Development Strategy in Vietnam (1999-2000) - Development Study, Comprehensive Study on the Sustainable Development of Transport System in Vietnam (2007-2010) ・Japanese ODA Loan - National Highway No.5 Improvement Project (1) (2) (3) (January, 1994, April, 1995, March, 1996) ・Asian Development Bank National Highway No.1 Rehabilitation Project (2002) ・Asian Development Bank - National Highway No.1 Rehabilitation Project (2002)

2. Outline of the Evaluation Study

2.1 External Evaluator

Masumi Shimamura, Mitsubishi UFJ Research and Consulting Co., Ltd.

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: August, 2017 – September, 2018

Duration of the Field Study: October 29 – November 25, 2017, December 3 – December 23, 2017, March 18 – April 16, 2018

2.3 Evaluation Approach

Both Red River Bridge Construction Project (I) (II) (III) (IV) and Hanoi City Ring Road No.3 Construction Project are located on Ring Road No. 3, therefore, ex-post evaluation was conducted for both projects as one in this evaluation study. As an evaluation approach, basically, analysis and judgment was made on each project, and based on these results comprehensive judgment was made, taking both projects as one.

In addition, since Red River Bridge Construction Project (I) (II) (III) (IV) is a time sliced project[3] for which loan was provided in four phases, in the analysis of efficiency, project scope (outputs) was analyzed and evaluation judgment was made as a whole, taking the whole as one project. (As regards outputs, comparison was made between phase I plan and the actual. As regards project period, comparison was made between phase I plan and the actual since the timing of each phase was different. As regards project cost, comparison was made between phase IV plan at the time of final scope change and the actual.)

3. Results of the Evaluation (Overall Rating: B[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Consistency with the Development Plan of Vietnam

In the *Socio-Economic Development 10-year Strategy* (hereinafter referred to as "SEDS") (2001-2010) at the time of appraisal, the Vietnamese Government established the road development policies, emphasized on road development at industrial development districts in each region, maintenance of major bridges, renovation and new construction of roads considering access to the Greater Mekong Sub-region (GMS) countries. Also, in the *Eighth Social Economic Development Five-Year Plan* (hereinafter referred to as "SEDP") (2006-2010) and *Road Development Master Plan to 2010 and*

[3] For large-scale projects, projects are divided into phases by period and are implemented in accordance with their progress.

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[5] ③:High, ②:Fair, ①:Low

Orientation Up to 2020, the importance of main road development in urban areas such as Hanoi and Ho Chi Minh was pointed out. Furthermore, the *National Vehicle Transport Development Master Plan (～2010)* which was formulated through the *National Transport Strategy Study for the Socialist Republic of Vietnam (VITRANSS)* (created by JICA in 2000, target year 2020) pointed out the construction of an effective transportation network by 2010 as well as development of public transportation networks in urban areas such as Hanoi and Ho Chi Minh.

At the time of ex-post evaluation, the Vietnam Government focused on the construction and investment of urban infrastructure, especially in Hanoi City in the SEDP (2011-2020). In SEDP (2011-2015), the government indicates that one of the important aspects of socioeconomic infrastructure development in metropolitan areas is the establishment of an urban transportation network that uses advanced and environmentally friendly technologies. Thus, the infrastructure investment for easing traffic congestion in Hanoi City particularly is considered as the most important development priority. In addition, the importance of the Ring Road No.3 continues to be recognized as the center of traffic access to and from Hanoi City in the *Hanoi Transportation System Master Plan (-2030)* formulated in March 2016 by Hanoi People's Committee. In order to respond to the further increase in traffic demand in the future, it is indicated that improvement of the Ring Road No.3 and construction of Ring Road No.4 and No.5 in the outline are necessary. Even at the time of ex-post evaluation, it is considered as important to implement of urban road infrastructure improvement.

3.1.2 Consistency with the Development Needs of Vietnam

Upon appraisal, urban traffic was not improved in response to the population increase in the capital city of Hanoi and fierce road traffic demand due to the rapid urbanization accompanied by high economic growth and motorization, and thus there was an urgent need to improve road traffic in Hanoi City and surrounding areas. Both projects aim to respond to increasing traffic demand in Hanoi City and surrounding areas by constructing a new bridge and ring road, thereby contributing to securing efficient logistical transportation and meeting the development needs of Vietnam.

At the time of ex-post evaluation, although there is improvement in transportation infrastructure especially in trunk transportation network in Vietnam, traffic volume has been greatly exceeding capacity in both physical distribution and human flow with high economic growth rate exceeding 7% per year on average, so investment in transportation infrastructure development is an urgent issue. As shown in Table 1, the volume of passenger traffic and freight traffic in Hanoi City and Red River Delta are increasing every year, especially after the merge of the former Ha Tay Province, located

adjacent to the west of Hanoi's old area, into the Hanoi City in August 2008, which has become one of the causes of further increase of population and traffic volume in Hanoi City.

Table 1: Trend in Passenger and Freight Traffic by Road in Hanoi and Red River Delta

	2008	2009	2010	2011	2012	2013	2014	2015
Hanoi								
Passengers (mil. persons)	495.8	547.8	646.6	651.0	719.3	776.8	855.9	917.5
Freight (thous. tons)	55,203	58,491	71,450	75,109	82,522	75,920	84,006	90,306
Red River Delta								
Passengers (mil. persons)	579.5	638.4	748.6	767.9	842.5	906.7	997.6	1,071.0
Freight (thous. tons)	148,108	163,433	191,371	215,947	238,811	245,226	265,067	288,159

Source: General Statistics Office of Vietnam

Under these circumstances, the importance of the Hanoi City Ring Road No.3 continues to be pointed out for the improvement of logistics through easing traffic congestion in Hanoi City and improving efficiency of road network. For this reason, the importance of both projects remains unchanged at the time of ex-post evaluation.

3.1.3 Consistency with Japan's ODA Policy

The *Country Assistance Program for Vietnam* and *Country-Specific Business Implementation Policy* indicated to provide assistance especially focusing on "international and domestic trunk line transportation (northern and southern economic growth priority areas, north-south trunk line), urban transportation (Hanoi City, Ho Chi Minh City). In addition, the *Overseas Economic Cooperation Operations (FY2005)* regarded "infrastructure development for sustainable growth" as a priority area and stated the improvement of economic infrastructure such as transportation etc. as the foundation of economic and social activities. Both projects aim to eliminate traffic congestion in the city and improve commodity distribution in the northern part of Vietnam by constructing bridges and ring road in Hanoi City, thereby contributing to economic growth in the region and being consistent with the Japanese government's support policy at the time.

From the above, this project has been highly relevant to the country's development plan

and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

3.2.1.1 Red River Bridge Construction Project (I) (II) (III) (IV)

As regards outputs, comparison was made between phase I plan and the actual as described above. Table 2 summarizes the comparison of planned and actual outputs.

Table 2: Comparison of Planned and Actual Outputs

Phase I Plan	Actual	Change Time・Contents
Civil Works		
(a) Bridge Construction		
① Red River Bridge (new construction) Bridge Length: 3.1km Number of Lanes: out-bound/in-bound 6 lanes	As planned	―
―	② -1 Phap Van Viaduct construction (new construction)	Added at the time of phase III appraisal
―	② -2 Phap Van Viaduct construction (new construction) partial extension	Added at the time of phase III implementation
―	③New Phu Dong Bridge widening	Added at the time of phase III appraisal
(b) Approach Road (New Construction)		
①Thanh Tri Section (section between National Highway No.1 and Red River Bridge) Bridge Length: 6.6km, Number of Lanes: out-bound/in-bound 4 lanes, Number of Interchanges: 3, Toll plaza: 1 ② Gia Lam Section (section	①Thanh Tri Section: toll plaza in 1 place was cancelled, other than that, as planned ② Gia Lam Section: as planned ・7 bridges were changed to	Modified during phase III implementation

between National Highway No.5 and Red River Bridge) Bridge Length: 3.6km, Number of Lanes: round-trip 4 lanes, Number of Interchanges: 2 Total number of bridges for ① Thanh Tri Section and ②Gia Lam Section: 7	"4 bridges, 2 flyovers and 1 viaduct"	
(c) Social Infrastructure Development for Resettlement Areas		
Infrastructure development in resettlement areas (6 places) (road, drainage, distribution line, water supply etc.)	Infrastructure development in resettlement areas (10 places) (road, drainage, distribution line, water supply etc.)	Number of resettlement sites increased at the time of phase II appraisal
(d) Others		
—	Construction of ramps (4 places) (= clover leaf interchange), realignment of rail road (section of 2km) and widening of existing National Highway No. 5 (section of 0.5km) in Gia Lam Section	Added during Phase IV implementation
Consulting Services		
・Assistance in tendering and construction supervision etc. ・Provision of training to maintenance engineers, preparation of maintenance manual, assistance in environmental measures	As planned	—

Source: Results from questionnaire survey of executing agency

Major changes and reasons for change in outputs of civil works are as follows.

(a) Regarding bridge construction, Red River Bridge was constructed as planned. Construction of Phap Van Viaduct (new construction) and widening of New Phu Dong Bridge were added at the time of phase III appraisal. In addition, partial

extension of Phap Van Viaduct was added during phase III implementation. Construction section of Phap Van Viaduct including the partial extension is a heavy traffic section, located in the western end of the project and is connecting to Phap Van – Cau Gie Inter Change leading to National Highway No. 1 and to Phap Van – Cau Gie Road. In order for Rind Road No. 3 to fully demonstrate its function as a ring road, it was necessary to newly construct and extend Phap Van Viaduct. In addition, the widened section of New Phu Dong Bridge is located in the eastern end of the project and is necessary to go through this section in order to pass New National Highway No. 1 north and south, after the construction of Red River Bridge. After the development of Red River Bridge, traffic increase was anticipated in this section, and industrial zones (such as Sai Dong Industrial Zone) were developed in the surrounding areas. Thus, it was necessary to widen the bridge so as to respond to increasing traffic and to exercise full function as a ring road. The executing agency recognized the importance and urgency of their development at the time of phase I planning of the project and had planned to develop the scope with their own funds. However, since project cost was saved due to the effect of exchange rate fluctuation during the project period (depreciation of Vietnamese Dong against yen), the executing agency added them to this project scope[6]. The additional scope is deemed appropriate, commensurate with inputs, in light of its high importance and urgency.

(b) Regarding approach road (new construction), deletion or change of scope was decided during phase III implementation. Toll plaza was cancelled because new regulation regarding setting intervals of toll plazas were introduced and enforced, and installation of the toll plaza, which had been originally planned was no longer necessary. Construction of seven bridges was changed to four bridges, two flyovers and one viaduct because land use plan around the planned construction site of bridge was changed. Scope change is deemed appropriate, commensurate with inputs, in order to respond to the enforcement of new provisions regarding the establishment of toll plazas as well as change of land use plan.

(c) Regarding social infrastructure development for resettlement areas, the number of resettlement sites increased from six to ten during phase II appraisal. This was because a survey on the number of resettled households was conducted during phase I implementation and it became clear that there were more target households than initially anticipated. The increase in the number of resettlement sites is deemed appropriate, based on the actual number of target households.

(d) In addition, construction of ramps (four places), realignment of rail road, and

[6] The executing agency explained that it was going to utilize its own fund to develop them even if they were not added to the project scope, given their high importance and urgency.

widening of existing National Highway No. 5 in Gia Lam Section were added during phase IV implementation. Gia Lam Section is located at the connection point of Ring Road No. 3 and National Highway No. 5, and exit/entrance points from Ring Road 3 to National Highway No. 5/National Highway No. 5 to Ring Road 3 have been encountering chronic traffic congestion. After the development of Red River Bridge, further traffic increase was anticipated, and development of clover leaf interchange was necessary so as to cope with the situation and Hanoi Ring Road No. 3 could function sufficiently as a ring road. (Realignment of existing rail road was necessary to develop the interchange.)

Vietnamese government originally planned to develop them with its own funds, but they were added to the project scope during phase IV as highly urgent project. They are judged to be appropriate, commensurate with inputs.

The work content of consulting services was carried out as planned. Comparison of planned and actual inputs of consulting services is as shown in Table 3.

Table 3: Comparison of Planned and Actual Inputs of Consulting Services

	Plan	Actual	Comparison
International Consultants	1,032.55MM	1,020.84MM	-11.71MM
Local Consultants	6,982.33MM	7,369.65MM	387.32MM
Total	8,014.88MM	8,390.49MM	375.61MM

Source: Results from questionnaire survey of executing agency

New Phu Dong Bridge (Bridge is shown behind)

A Part of Clover Leaf Interchange and Rail Road after Realignment

3.2.1.2 Hanoi City Ring Road No.3 Construction Project

Table 4 shows the comparison of planned and actual outputs.

Table 4: Comparison of Planned and Actual Outputs

Plan	Actual
Civil Works	
(a) Road	
Ring Road No.3 major road: Total Length: 8.9km (of which length of viaduct: about 8.5km) Number of Lanes: round-trip 4 lanes	As planned
—	Underpasses: 2 places
—	Flyover: 1 place
(b) Interchange	
Interchange construction: 3 places	As planned
Consulting Services	
・Detailed design and assistance in tendering (review of preliminary design, implementation of detailed design etc., assistance in implementation of environmental and social consideration, assistance in tendering, provision of training) ・Construction supervision (construction supervision, assistance in implementation of environmental and social consideration, provision of training)	As planned

Source: Results from questionnaire survey of executing agency

Regarding civil works, underpasses in two places and a flyover in one place were added to the project scope. These additional outputs are not located on the Ring Road No. 3 itself but on the existing road. They were added to meet the traffic demand of the connection point with the section between Trung Hoa Inter Change and Thanh Xuan Inter Change section of Hanoi Ring Road No. 3 and the existing road where the traffic congestion occurred chronically. At the time of appraisal, due to the high importance and urgency, priority was given to the development of the Ring Road No. 3 itself given the budget constraint, however, the above mentioned additional outputs were added to the project scope based on the fact that total project cost of the construction of Ring Road itself was reduced due to the effect of exchange rate fluctuation during the project period.

The work content of consulting services was carried out as planned. Coverage of detailed design, assistance in tendering etc. increased with the addition of the scope of construction work, however, input amount was saved due to the shortened construction period. Specifically, it is as shown in Table 5.

Table 5: Comparison of Planned and Actual Inputs of Consulting Services

	Plan	Actual	Comparison
International Consultants	392.99MM	385.78MM	-7.21MM
Local Consultants	3,026.44MM	2,821.39MM	-205.05MM
Total	3,419.43MM	3,207.17MM	-212.26MM

Source: Results from questionnaire survey of executing agency

Ring Road No. 3 (taken from the ordinary road)

Underpass Constructed on the Existing Road

3.2.2 Project Inputs

3.2.2.1 Project Cost

1) Red River Bridge Construction Project (I) (II) (III) (IV)

As regards total project cost, as mentioned above, comparison was made between phase IV plan at the time of final scope change and the actual. The total project cost in phase IV was planned to be 58,931 million yen (out of which 40,989 million yen was to be covered by Japanese ODA loan). In actuality, the total project cost was 54,368 million yen (out of which 39,153 million yen was covered by Japanese ODA loan), which is lower than planned (92% of the planned amount). The reason why the total project cost was lower than planned was due to the effect of depreciation of local currency, Vietnamese Dong (VND) against yen during the project

implementation period[7]. As mentioned above, although project scope was added during phase IV implementation, as a result of reduction of total project cost due to the effect of exchange rate fluctuation (yen appreciation, VND depreciation), the actual total project cost was still below the planned cost even after considering this scope increase.

2) Hanoi City Ring Road No.3 Construction Project

The total project cost was initially planned to be 33,333 million yen (out of which 28,069 million yen was to be covered by Japanese ODA loan). In actuality, the total project cost was 24,787 million yen (out of which 22,741 million yen was covered by Japanese ODA loan), which is lower than planned (74% of the planned amount). The reason why the total project cost was lower than planned was due to the effect of depreciation of local currency, Vietnamese Dong (VND) against yen during the project period[8]. As mentioned above, underpasses in two places and a flyover in one place were added to the project scope utilizing the fact that overall project cost was reduced. Due to the effect of exchange rate fluctuation (yen appreciation, VND depreciation), the actual total project cost was still below the planned cost even after taking this scope increase into consideration.

3.2.2.2 Project Period

1) Red River Bridge Construction Project (I) (II) (III) (IV)

As regards project period, comparison was made between phase I plan and the actual as mentioned above. At the time of Phase I appraisal, the overall project period was planned as 66 months, from March, 2000 (signing of Loan Agreement) to August, 2005 (completion of construction[9]). The planned project period was 123 months, after adding the planned period of additional scope at the time of phase III appraisal and implementation (from October, 2005 to December, 2007 (27 months)) and planned period of additional scope during phase IV implementation (from July, 2013[10] to December, 2015 (30 months)) (the end of warranty period[11]). Whereas, the actual project period was 219 months, from March, 2000 (signing of Loan

[7] At the time of phase IV appraisal, it was estimated as 1 VND = 0.00703 JPY. However, the actual rate was a weak VND trend as 1 VND = 0.005897 JPY (average rate by IMF between 2000 and 2017)
[8] At the time of appraisal, it was estimated as 1 VND = 0.00759 JPY. However, the actual rate was a weak VND trend as 1 VND = 0.004926 JPY (average rate by IMF between 2008 and 2017)
[9] Excluding warranty period.
[10] Implementation of additional scope was decided in November, 2011. Although the start time is unknown, there is a remark stating "detailed design has already been started" in the JICA provided document of July, 2013 concerning the decision on procurement method of the additional scope. Thus, it is certain that the additional scope started before that time. Therefore, the starting time is set as such since it has started at lease by this time.
[11] According to information provided by JICA, completion of construction was planned in December 2014.

Agreement) to May, 2018 (the end of warranty period[12]) (including implementation period of the additional scope), which is significantly longer than planned (178% of the initial plan)[13]. Loan periods were extended in phase II and IV projects due to project delay. The reason for the extension of phase II is that it took time to select contractors and the start of construction work was delayed. The reason for the extension of phase IV is due to the additional scope of construction of ramps etc. in Gia Lam section. All the project scope other than this additional scope has been completed within the loan disbursement period (August, 2012) before loan extension. Table 6 compares the planned and actual project period. In addition, Table 7 summarizes the original plan and actual construction period for each output.

Table 6: Comparison of Planned Project Period at the Time of Phase I Appraisal and Actual

Item	Plan (At Phase I Appraisal)	Actual (At Ex-post Evaluation)
Detailed design (JICA Technical Cooperation in collaboration with Yen loan cooperation)	–May 2000	–Sept. 2000
Selection of consultants (review of detail design, construction supervision etc.)	Dec. 1999–May 2000 (6 months)	May 2000–Nov. 2000 (7 months)
Consulting services (review of detail design, construction supervision etc.)	Jun. 2000–Aug. 2005 (63 months)	Jan. 2001–Aug. 2016 (188 months)
Land acquisition, resettlement	Jan. 2000–Feb. 2002 (26 months)	Mar. 2000–Mar. 2010 (121 months)
Construction (Red River Bridge)	Jun. 2001–May 2005(48 months)	Nov. 2002–Feb. 2007 (52 months)
Construction (Ring Road No.3)	Mar. 2002–Aug. 2005 (42 months)	Mar. 2005–May 2012 (87 months)
Construction (Ramps etc. in Gia Lam Section)	—	Dec. 2014–May 2018 (42 months)
Infrastructure Development for Resettlement Sites	Dec. 1999–Jul. 2002 (32 months)	Nov. 2002–Jul. 2005 (33 months)

Source: Information provided by JICA, and results from questionnaire survey of executing agency

Note 1) Selection of consultants, land acquisition and resettlement, and infrastructure development of resettlement sites have started before the signing of the loan agreement of the project

[12] Source: Information provided by JICA.
[13] The period up to the start of each additional scope is considered as the preparation period and included in the actual project period.

Table 7: Comparison of Planned and Actual Project Period for Each Output for Red River Bridge Construction Project (I) (II) (III) (IV)

Item	Plan	Actual (At Ex-post Evaluation)
Original Scope (Plan at the time of Phase I Appraisal)		
Red River Bridge	Jun. 2001–May 2005 (48 months)	Nov. 2002–Feb. 2007 (52 months)
Ring Road No. 3 (Gia Lam Section)	Mar. 2002–Aug. 2005 (42 months)	Mar. 2005–Aug. 2009 (54 months)
Ring Road No. 3 (Thanh Tri Section)	Mar. 2002–Aug. 2005 (42 months)	Mar. 2005–Oct. 2010 (68 months)
Additional Scope (Plan at the Time of Phase III Appraisal. As regards Phap Van Viaduct, scope was added during Phase III Implementation (partial extension))		
New Phu Dong Bridge	Jan. 2006–Dec. 2007 (24 months)	Oct. 2008–Jun.2012 (45 months)
Phap Van Viaduct	Oct. 2005–Sept. 2007 (24 months)	Oct. 2008–Oct. 2010 (25 months) (Bridge Section) Oct. 2008–Mar. 2011 (30 months) (Road Section)
Additional Scope (Plan during Phase IV Implementation)		
Ramp etc. in Gia Lam Section	Jul. 2013 (estimation)–Dec. 2014 (18 months)	Dec. 2014–May 2018 (42 months)

Source: All the actual periods are the results from questionnaire survey of executing agency

When comparing planned and actual period of construction work for each output in Table 7, construction periods for Red River Bridge, Gia Lam section, Thanh Tri section, New Phu Duong Bridge widening, Phap Van Viaduct, and ramp etc. in Gia Lam Section have all delayed. Major reason for this was the delay of land acquisition. In fact, looking at Table 6, land acquisition and resettlement has been delayed by 95 months (7 years 11 months), from the initial plan of 26 months prolonged to 121 months, and consulting services (construction supervision) have also delayed significantly.

The background of land acquisition delay were ① change in the administrative division of Hanoi City, and ② delay in land acquisition process. Regarding ①, (1) in 2004, Gia Lam District of Hanoi City where the project site was located was divided into Gia Lam District and Long Bien District, and due to the change of administrative division, delays in administrative procedures such as coordination and approval procedures occurred, (2) due to the merger of Ha Tay Province to Hanoi City in 2008, the administrative management system was reorganized and the Compensation Committee of Hanoi City People's Committee had to be established again. According to the executing agency, the above (1) was announced by the

government in November 2003[14] and it was not foreseeable at the time of the phase I and II appraisal (1999 and 2001, respectively). The above (2) was announced by the government in August 2008[15], and the executing agency explained that it was not foreseeable at the time of the phase III and IV appraisal (2003 and 2005, respectively). Regarding ②, there were cases that it took time to confirm ownership and to adjust among residents because land ownership was unclear. In addition, although it was not for resettlement, there were cases in which it took time for consensus process on compensation amount to the residents who provided part of their farmland. As described later, land acquisition process was properly implemented based on Vietnamese regulations, and unreasonable land acquisition was not carried out.

2) Hanoi City Ring Road No.3 Construction Project

Project period planned at the time of appraisal was 91 months, which is the period totalling the planned period of the original scope from March, 2008 (signing of Loan Agreement) to December, 2011 (completion of construction[16]) (46 months) and the planned period for the additional scope (from May, 2012 to January, 2016) (45 months)[17]. In actuality, the project period was 101 months when totalling the actual period of the original scope from March, 2008 (signing of Loan Agreement) to November, 2012 (completion of construction[18]) and the actual period for the additional scope (from November, 2011[19] to July, 2016), which is longer than planned (111% of the initial plan)[20]. Loan period was extended due to project delay. Table 8 summarizes the comparison of planned and actual project period.

Table 8: Comparison of Planned and Actual Project Period

Item	Plan (At Project Appraisal)	Actual (At Ex-post Evaluation)
Detailed design	Jan. 2008–Jun. 2008 (6 months)	Mar. 2008–Dec. 2009 (22 months)
Consulting services (construction supervision)	Jun. 2009–Jan. 2012 (32 months)	Apr. 2010–Jul. 2016 (76 months)
Bidding, contract	Apr. 2008–Jun. 2009 (15 months)	Sept. 2008–Jun. 2011 (34 months)
Construction (originally planned)	Jul. 2009–Dec. 2011 (30 months)	Jun. 2010–Nov. 2012 (30 months)
Land acquisition	–Dec. 2008	Apr. 2001–Jun. 2010 (111 months)
Underpasses, Flyover (additional)	—	Jul. 2014–Jul. 2016 (25 months)

[14] Legal basis is Decree 132/2003/ND-CP November 6, 2003.
[15] Legal basis is Decision 15/2008/QH12 dated May 29, 2008.
[16] Excluding warranty period.
[17] Information provided by JICA.
[18] Excluding warranty period.
[19] Implementation of additional scope was decided in November, 2011.
[20] The period until the start of the additional scope is considered as the preparation period and included in the actual project period.

Source: Information provided by JICA, and all the actual periods are the results from questionnaire survey of executing agency

Note 1) Detailed design was carried out as part of Red River Bridge Construction Project. Construction supervision was conducted as part of this project.

Note 2) Land acquisition and resettlement was not implemented in this project, but implemented in the side road construction project (phase 1 project) carried out by the Vietnamese government using its own fund prior to this project. This project to construct motor vehicle exclusive road in viaduct is regarded as phase 2 project from the Vietnamese side.

Table 9：Comparison of Planned and Actual Period of Additional Scope

Item	Plan	Actual
Underpasses, Flyover	May 2012–Jan. 2016 (45 months)	Jul. 2014–Jul. 2016 (25 months)

Source: Information provided by JICA, and results from questionnaire survey of executing agency

The main reason for project delay is due to the delay of selection of contractors as a consequence of unsuccessful bidding. As a result of project facilitation of construction work to restore the delay of contractor selection, package 1 construction work was shortened by 15 months and package 2 construction was shortened by 8 months. However, due to the difference in implementation period of both packages, total construction period was 34 months, exceeding the plan (30 months) by 4 months.

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

Regarding Red River Bridge Construction Project, at the time of appraisal, the economic internal rate of return (hereinafter referred to as “EIRR”) calculated at the time of phase IV project appraisal was 16.73%, on the assumption that vehicle operation cost saving and time saving from the project (Red River Bridge construction portion) to be considered as benefit, project cost (excluding tax) and operation and maintenance cost to be regarded as cost, and project life assumed to be 30 years. The EIRR recalculated at the time of ex-post evaluation[21] turned out to be 8.6%, which is lower

[21] In light of the fact that construction work (ramp etc. in Gia Lam Section, the last construction section) was completed in August 2016 and there was one year of warranty period after completion, benefits of the project as a whole are recalculated from 2017. Traffic volume is expected to increase during project life, applying the increase rate of traffic volume of this project from the completion to 2017 based on the target values for road related indicators etc. in Hanoi City until 2030 shown in the *Hanoi Transportation System Master Plan (-2030)*, and actual passenger and freight traffic by road in Hanoi City. Passenger Car Unit (PCU) used at the time of recalculation is the value obtained by converting the traffic volume including passenger cars, buses, trucks, motorcycles and the like into passenger car traffic volume. PCU conversion coefficients are based on the standards commonly used in Vietnam (National Standard of TCVN 4054-98 of Viet Nam: passenger car = 1.0, bus (less than 25 seats) = 2.0, bus (25 seats or more) = 2.5, truck (biaxial) = 2.0, truck (three-axis) = 2.5, large truck = 4.0, and 40feet container = 4.0). In addition to increase of traffic volume itself, the rate of traffic increase is predicted assuming shifts of vehicle type (shift from passenger cars or the like having smaller PCU

than the figure at the time of phase IV appraisal. The main reason can be attributed to the traffic volume of Red River Bridge, which was lower than the target. When reviewing the EIRR calculation sheet at the time of phase IV appraisal, it can be inferred that calculation did not cover the entire project, but only the Red River Bridge construction portion. On the other hand, the EIRR recalculation at the time of ex-post evaluation covered the entire project.

Regarding Hanoi City Ring Road No.3 Construction Project, the EIRR calculated at the time of appraisal was 12.0%, on the assumption that reduction of vehicle operation cost, reduction of economic loss by time saving, and benefit due to reduction of traffic accidents from the project to be considered as benefit, project cost (construction cost, operation and maintenance cost, excluding tax) to be regarded as cost, and project life assumed to be 30 years. The EIRR recalculated at the time of ex-post evaluation[22] turned out to be 9.9%, which is lower than the figure at the time of appraisal. The main reason can be attributed to the lower traffic volume compared to the target.

In light of the above, as regards Red River Bridge Construction Project (I) (II) (III) (IV), although the project cost was within the plan, the project period significantly exceeded the plan. As regards Hanoi City Ring Road No.3 Construction Project, although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair when considering both projects as one project.

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conversion coefficient to trucks or containers having larger conversion coefficient). Vehicle operation cost is calculated based on the value derived using the model in the executing agency (Highway Development & Management Software). The basis used for calculation at the time of appraisal was not used since it is unknown.

[22] In light of the fact that construction work was completed in January 2013 and there was one year of warranty period after completion, benefits of the project are recalculated from 2014. Traffic volume is expected to increase during project life, applying the increase rate of traffic volume of this project from the completion to 2017 based on the target values for road related indicators etc. in Hanoi City until 2030 shown in the *Hanoi Transportation System Master Plan (-2030*), and actual passenger and freight traffic by road in Hanoi City. In addition to increase of traffic volume itself, the rate of traffic increase is predicted assuming shifts of vehicle type (shift from passenger cars or the like having smaller PCU conversion coefficient to trucks or containers having larger conversion coefficient). Furthermore, it is taken into account that after completion of "Hanoi City Ring Road No.3 Construction Project (Mai Dich - South Thang Long Section)", currently implemented with Japanese ODA loan, convenience of Ring Road No. 3 will be improved and traffic volume is also expected to increase for this project section. According to ex-ante evaluation of this project, service of the road is assumed to start in May 2018. The basis for calculating the PCU conversion coefficients and vehicle operation cost is the same as that of the Red River Bridge Construction Project. The basis used for calculation at the time of appraisal was not used since it is unknown.

3.3 Effectiveness and Impacts[23] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

1) Red River Bridge Construction Project (I) (II) (III) (IV)

Regarding operation and effect indicators, data of the existing surveys carried out by the executing agency was utilized. However, the measurement sections are not the three locations of Red River Bridge, Phap Van Viaduct, and New Phu Dong Bridge which were set at the time of appraisal, but the data of the entire section including them (New Phu Dong Bridge－Red River Bridge－Phap Van Viaduct, which is the scope of this project). (Table 10)

Table 10: Operation and Effect Indicators

	Target			Actual	
	2010			2016	2017
	1 Year After Completion			The Year of Completion[24]	1 Year After Completion
	Red River Bridge	Phap Van Viaduct	New Phu Dong Bridge	Section between New Phu Dong Bridge－Red River Bridge－Phap Van Viaduct	
Annual Average Daily Traffic (PCU/day)	73,130	55,848	20,254	53,134	54,278
Time Saving (Bil.VND/year)	81.49	54.36	31.14	350.69	357.84

Source: Prepared based on the data provided by the executing agency

Note 1) PCU stands for Passenger Car Unit. The value obtained by converting the traffic volume including passenger cars, buses, trucks, motorcycles and the like into passenger car traffic volume.

Note 2) Time saving is calculated by multiplying the shortened time by the time value.

Since completion of construction[25], when the project effects occur, was in August 2016, the target year is 2017 – one year after completion. Annual Average Daily Traffic of the project target section is regarded as an indicator because the project

[23] Sub-rating for Effectiveness is to be put with consideration of Impact.

[24] The year of completion indicated here is the year of project completion when the project effects occur, defined at the time of Phase I appraisal when the target values were established.

[25] Excluding warranty period.

aimed to mitigate congestion in Hanoi City and the surrounding areas by converting traffic volume to this project. The actual traffic volume is nearly the same level as the target figure of Phap Van Viaduct, about 74% of the target figure of Red River Bridge, and about 2.7 times the target figure of New Phu Dong Bridge. It is thought that the reason why the actual figure was about 74% of the target figure of Red River Bridge is that, in addition to this project, at the time of ex-post evaluation, there are bridges crossing the Red River which had been constructed after the appraisal of this project, such as Vinh Tuy Bridge and Nhat Tan Bridge (developed by Japanese ODA loan), and thus the traffic was dispersed to these other bridges. It is inferred that the actual figure was about 2.7 times the target value of New Phu Dong Bridge because there are no alternative bridges developed in the neighboring area. As for time saving, the actual figure is much higher than the target at the time of appraisal, which is about 4.3 times the Red River Bridge target and about 11.5 times the New Phu Dong Bridge target.

Based on the above, it can be considered that the effects as planned are largely achieved.

2) Hanoi City Ring Road No.3 Construction Project

As regards this project, data of the existing surveys carried out by the executing agency was also utilized. The measurement section is the same as the section set at the time of appraisal for time saving. However, for Annual Average Daily Traffic, data on the section from Mai Dich Interchange to North Linh Dam Lake (Phap Van Viaduct section), which is the scope of this project, is used, and not the data between Trung Hoa Inter Chance and Thanh Xuan Inter Change (where traffic volume was expected the most in the project section). (Table 11)

Table 11: Operation and Effect Indicators

	Target	Actual		
	2014	2015	2016	2017
	2 Years After Completion	2 Years After Completion	3 Years After Completion	4 Years After Completion
Annual Average Daily Traffic (PCU/day)	95,000	75,736	78,103	80,575
Time Saving (Hour/PCU)	0.31	0.48	0.48	0.48

Source: Prepared based on the data provided by the executing agency of survey

Note 1) PCU stands for Passenger Car Unit. The value obtained by converting the traffic volume including

passenger cars, buses, trucks, motorcycles and the like into passenger car traffic volume.

Note 2) Target figure of Annual Average Daily Traffic was between Trung Hoa Inter Chance and Thanh Xuan Inter Change where traffic volume was expected the most in the project section when dividing the project section into three.

Note 3) Target section of actual Annual Average Daily Traffic is the section from Mai Dich Interchange to North Linh Dam Lake (Phap Van Viaduct section) which is the scope of this project.

Note 4) Time saving is calculated by multiplying the shortened time by the time value. The unit is time/PCU, which is the same set at the time of appraisal.

Note 5) Target section for time saving for target figure and the actual is the section from Mai Dich Interchange to North Linh Dam Lake, which is the scope of this project.

Since completion of construction[26], which is the definition of project completion, was in January 2013, the target year is 2015 – two years after completion. The actual figure of Annual Average Daily Traffic is 79.72% of 95,000 PCU/day between Trung Hoa Inter Chance and Thanh Xuan Inter Change where traffic volume was expected the most in the project section. Regarding time saving, the measurement section is the same as the section set at the time of appraisal, which is about 1.5 times the target figure.

Based on the above, it can be considered that the effects as planned are largely achieved.

3.3.1.2 Qualitative Effects (Other Effects)

As qualitative effects of both projects, alleviation of traffic congestion in Hanoi City and improvement of logistics in the northern part of Vietnam were expected. In order to verify this assumption, interview survey was conducted to beneficiaries surrounding both projects (staff members of local enterprises (Japanese companies and local companies), drivers, relevant staff members of executing agencies of "Power Transmission and Distribution Network Development Project" for which ex-post evaluation is conducted at the same time (staff members of Northern Power Corporation, Hanoi Power Corporation, Hai Duong Power Corporation and Hai Phong Power Corporation), totaling 25 people (female: 4, male: 21[27]). As a result, all the interviewees responded that after project implementation, traffic volume of heavy vehicles such as trucks was dispersed to Ring Road No. 3 and Red River Bridge, and thus, traffic congestion in Hanoi City center was alleviated. In addition, although

[26] Excluding warranty period.

[27] Considering gender balance, request was made to interview women when making appointments, however, those who could respond at the time of visit and could respond appropriately to questions were biased to men.

there were variations in the usage situation of Ring Road No. 3 and Red River Bridge due to positional relationship with the location of companies/factories, suppliers, customers, etc., beneficiaries who frequently use both projects pointed out that both projects are contributing to the improvement of logistics in northern part of Vietnam, including improved access to Hanoi Airport and Hai Phong Port. For example, it was pointed out that prior to the project, it took four hours one way to travel from Hanoi City center to Hai Phong Port, crossing the Red River with Chuong Duong Bridge through Hanoi City and using National Highway No. 5. However, after the project, travel time is reduced to two hours one way, by crossing the Red River with Red River Bridge on Ring Road No. 3 and using newly developed Hanoi-Hai Phong Expressway, making it much easier to move on a day trip. It was pointed out that although time saving was greatly affected by the development of an expressway, travel time from Hanoi City until crossing Red River Bridge was shortened at least by 30 minutes, utilizing both projects. Furthermore, multiple beneficiaries indicated that due to the development of clover leaf interchange in Gia Lam section, chronic congestions in the section have been solved and smooth travel has realized.

Therefore, based on the analysis results of quantitative effect and results of interview to beneficiaries, it can be considered that both projects contribute to alleviating traffic congestion in Hanoi City and improving logistics in the northern part of Vietnam.

BOX 1: Results of Satisfaction Survey Targeting Japanese Companies

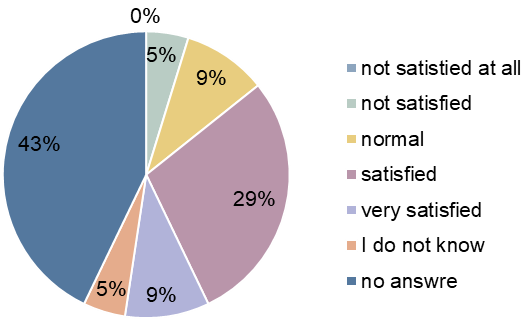
With particular attention to “the development of regional economies by securing smooth road transportation” which is set as an impact in the objectives of both projects, this satisfaction survey targeted Japanese companies to analyze the effects of both projects on their business environment. Questionnaires were distributed to 686 member companies via the Japanese Business Association in Vietnam. In this survey, among 120 sample companies randomly selected in order to obtain responses representing the characteristics of 686 companies that are the population, analysis was made for 50 companies, for which valid responses were finally obtained.

◆Result of the Survey

As a result of analyzing the valid 50 responses, 38% (16 companies) out of the 42 companies that use Red River Bridge and Ring Road No. 3 responded “very satisfied” or “satisfied”, and the reasons for this satisfaction were “avoiding traffic jams in Hanoi City”, “improving access between Hanoi City and neighboring provinces / cities”, “suppressing exhaust gas in Hanoi City”. There was no answer for “not satisfied at all”. On the other hand, 20 out of 42 companies (48%) answered “I do not

know" and "no answer", which exceeds the number of companies that answered "very satisfied" or "satisfied".

The main reason was that the frequency of using both bridge and road for business is low. Companies using either "road / bridge" or "one or the other" even if the frequency of use is low, and not responding "satisfied", mentioned that the reason for the answer was "because the traffic is always congested", "the surface of bridge and road is rough". In addition, 44% (11 companies) out of 25 companies which were founded before 2010 and use Red River Bridge and Ring Road No. 3, which are expected to be able to compare before and after implementation of both projects, answered "very satisfied" or "satisfied", which is the higher percentage than the above (16 out of 42 companies). There were many qualitative responses from 8 companies that realized the face-to-face interview to evaluate the effects of both projects positively. Specifically, except for 1 out of the 8 companies, there were responses that they realized the mitigation of traffic congestion and the time saving effect. On the other hand, one company that responded "not realized the improvement" in the face-to-face interview answered that "frequency of use is low, so we do not realize much about time saving effect" and it can be considered that low use frequency of both projects is less likely to lead to realization of improvement effect. It should be noted that these companies are interested in both projects and are cooperative in the survey, but it can be considered that these responses support the judgment of effectiveness and impact in this ex-post evaluation. Also, in order to confirm the synergistic effect of both projects, as a result of inquiries as to whether the time is shorted to travel from Gia Lam District in eastern Hanoi City (the district near the eastern end of Red River Bridge Construction Project) to Mai Dich District in the west (the district in the vicinity of the west end of Hanoi Ring Road No.3 Construction Project) by avoiding moving in the central part of Hanoi City, 77% (27 companies) of the 35 companies using both Red River Bridge and Ring Road No.3 answered "shortened".



Source: Prepared based on the results of satisfaction survey

3.3.2 Impacts

3.3.2.1 Intended Impacts

As impacts of both projects, development of regional economy through securing smooth road transport was anticipated. Since these macro changes are also affected by factors other than both projects, it is difficult to verify direct correlation, however, in order to confirm the assumption at the time of appraisal, transition of Gross Domestic Regional Product (hereinafter referred to as "GDRP"), industrial production, and foreign direct investment (hereinafter referred to as "FDI") in Hanoi City over the previous year was analyzed. (Table 12)

Table 12: Year-on-Year Growth Rate of GDRP, Industrial Production and FDI in Hanoi City

	2012	2013	2014	2015	2016	2017
GRDP Increase (%)	8.1	8.3	8.8	9.2	8.2	8.5
Industrial Production Increase (%)	5.1	4.5	4.6	8.3	7.1	6.7
FDI Increase (%)	10.9	11.3	18.4	1.9	2.4	6.1

Source: Results from questionnaire survey of executing agency (original data is from the General Statistics Office of Vietnam and the Center Statistics Office of Hanoi)

Note) Data in 2017 is from January to September.

GDRP, industrial production and FDI have all increased year-on-year – GRDP has been in the range of 8 to 9% increase, and industrial production is in the range of 4 to 8% increase. With respect to FDI, figures have changed by two digits between 2012 and 2014. Although the increase rate has greatly dropped in 2015, the increase rate has expanded since 2016, showing V-shape recovery. In addition, according to interviews with local companies, surrounding areas were farmlands before the implementation of both projects, but commercial areas and residential areas were developed after the project, and development of industrial zones has also progressed and urban development has been promoted.

In light of the above, it can be considered that both projects are contributing to the development of regional economy.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Natural Environment

Both project falls under A category of JBIC Guidelines for Confirmation of Environmental and Social Considerations (October 1999 and April, 2002, respectively) because they are development project of large-scale bridges and roads.

For both projects, executing agencies have prepared environmental management plans in accordance with *the Environmental Impact Assessment (EIA) reports*, and have periodically conducted environmental monitoring during project implementation based on the plans. Specifically, Scientific and Technological Center for Environmental Protection in Transportation (CEPT) which belongs to the Institute of Transport Science and Technology (ITST) under the Ministry of Transport has conducted the Environmental Monitoring. According to the executing agency, the monitoring items are soil (including excavated soil treatment), water quality, air, noise, vibration, etc., and observation points are more than 20 for Red River Bridge Construction Project, and about 10 for Hanoi City Ring Road No.3 Construction Project. According to the executing agency, there was no big problem overall on the monitoring results, but there were cases where noise and air (dust) exceeded the standards, and mitigation measures such as watering the project site, washing tires of construction vehicles, regulating noise of construction equipment during construction in the middle of the night, etc. were carried out. No environmental monitoring has been conducted at the time of ex-post evaluation. Based on interviews with local residents[28], there is no particular problem with regard to soil, water quality, air, noise, vibration, etc. during project implementation and after project completion (there are dust and noise with increasing traffic volume, but within the acceptable level, not to be worried).

In light of the above, no particular problem has been reported on the impact on the natural environment.

2) Resettlement and Land Acquisition

① Red River Bridge Construction Project (I) (II) (III) (IV)

Results of resettlement and land acquisition are summarized in Table 13. Actual number of resettled households was 1,244, slightly more than 1,200 households initially expected at the time of appraisal.

[28] Interviews were conducted to 11 resettled residents who were affected by the project (11 residents of 10 districts living in the resettlement sites, four women and seven men).

Table 13: Results of Resettlement and Land Acquisition

Resettlement Sites (District Name)	Land (m^2)	Resettlement (Household)
X1	38,395	166
X2a	115,305	362
X2b	45,446	271
X3	51,641	274
X4	13,338	44
X5	10,813	14
X6	17,412	38
X6a	4,974	10
X7	8,794	28
X8	10,875	37
Total	316,993m^2 = 31.7ha	1,244

Source: Results from questionnaire survey of executing agency

According to the executing agency, all relocated residents had opted to move to the resettlement sites. Resettlement sites (Figure 2) are located as close as possible to the original place of residence, and consideration is given as much as to minimize negative effects, such as enabling the entire community to relocate to the same site. According to the executing agency, resettlement and land acquisition were carried out based on the rules of Vietnam[29]. Specifically, Hanoi People's Committee has established a Compensation Committee (the executing agency is also a member of this Committee) and prepared land acquisition/resettlement plan. Public hearings and consultation, and negotiation on the compensation amount to the affected residents were carried out repeatedly.

[29] Decree No. 22/1998/ND-CP (April 24, 1998) of Vietnamese government and Decision No.20/1998/QD-UB (April 24, 1998) of Hanoi City People's Committee.
Decree No. 197/2004-ND-CP (December 3, 2004) of Vietnamese government and Decision QD18/2008/QD-UNBD (September 29, 2008) of Hanoi City People's Committee.

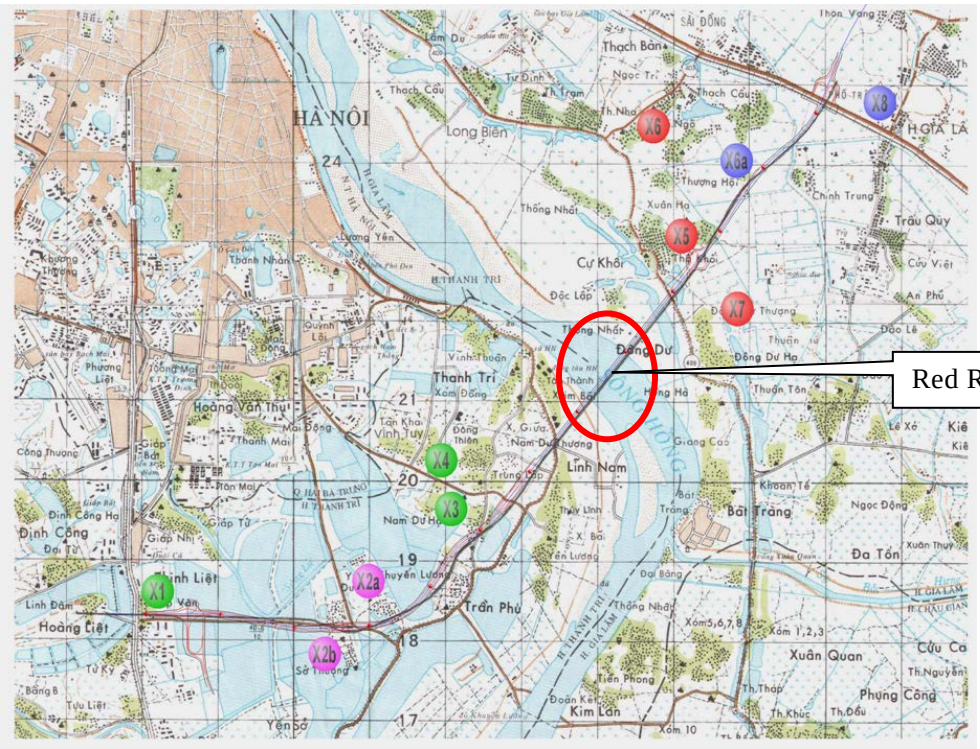


Figure 2: Resettlement sites of Relocated Residents

Source: Prepared from the information provided by executing agency

According to the interview with the executing agency and affected residents[30], there were cases in which it took time to confirm the ownership and make adjustment between residents because land ownership was unclear with respect to land acquisition process. In addition, although it was not for resettlement, but there were cases in which it took time for consensus process on compensation amount for residents who provided part of their farmland. According to the executing agency, final agreement was reached after carefully explaining the project purpose and the importance of the project. Rresidents who have relocated to the resettlement sites presented their opinion that they did not have any particular objection to the compensation amount, infrastructure etc. of resettlement sites are developed by this project, and thus they are entirely satisfied with their current life.

[30] The same 11 residents described in footnote 28.

Resettlement Site (X2a District)

Resettlement Site (X6 District)

② Hanoi City Ring Road No.3 Construction Project

As described above (Table 8, Note 2 of "Project Period" under Efficiency), land acquisition and resettlement were carried out by the construction project of side road which Vietnamese government has implemented with their own fund (phase 1 project), prior to this project. This project, constructing an exclusive road for motor vehicles as viaduct, is regarded as phase 2, and land acquisition and resettlement were not carried out in this project. Under phase 1 project, 2,186 households were relocated and 98ha of land was acquired, which was almost as planned.

According to the executing agency, resettlement and land acquisition were carried out based on the rules of Vietnam just like Red River Bridge Construction Project. In phase 1 project, securing resettlement sites and social infrastructure development were not carried out, and those who wished have moved to municipal apartments developed by Hanoi City. Relocated residents are said to have purchased apartments utilizing compensation they received. As with Red River Bridge Construction Project, it was said that there were cases in which it took time to confirm land ownership and to coordinate among residents, as well as cases where it took time for consensus process on compensation amount.

3) Measures Against HIV/AIDS Infections for Construction Workers and Others

Contractors of both projects commissioned contracts with local NGO, Center for Development of Community and Children (CDECC), and carried out activities to cope with HIV/AIDS infections for construction workers and others. Main contents of the program were; (1) provision and dissemination of information on HIV/AIDS infection control measures to construction workers and residents around construction

sites, (2) peer education[31] for construction workers, (3) holding events to promote understanding on the importance of measures against HIV/AIDS infection, (4) promoting distribution and use of condoms, and (5) developing a system for counseling, examination and treatment of sexually transmitted diseases for construction workers. According to the executing agency, knowledge and understanding of HIV/AIDS infection control measures have deepened for construction workers and residents around construction sites etc., and all construction workers took medical examinations.

As mentioned above, regarding Red River Bridge Construction Project, although the actual figure of traffic volume was less than 80%, about 74% of the target figure of Red River Bridge, among the target figures of three points set at the time of phase IV appraisal, when taking into account that it is the figure after the traffic has been dispersed to other new bridges (Vinh Tuy Bridge and Nhat Tan Bridge) which have been constructed after the appraisal of this project, it can be regarded that the target has been sufficiently achieved[32]. The actual figure for time saving has greatly exceeded the target values for all three points. For Hanoi City Ring Road No.3 Construction Project, the actual traffic volume is 79.72% of the target, slightly less than 80%, however, it is judged that the project has achieved the target when considering the results of hearings to beneficiaries. The actual figure for time saving greatly exceeded the target set at the time of appraisal. As for the impact, it is considered that sufficient effects have come out based on the trend of statistical data related to the regional economy and the results of interviews with local companies and others. In light of the above, both projects have largely achieved their objectives as planned. Therefore effectiveness and impacts of the projects are high.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

The operation and maintenance after project completion is undertaken by Hanoi Department of Transport (hereinafter referred to as “Hanoi DOT”) under Hanoi People’s Committee. At the time of appraisal, operation and maintenance was to be handled by

[31] Peer education is an educational method to train a few people as peer educators from groups with common occupation, generation, educational level, socio-economic situation, cultural background etc., and peer educators think and learn together while sympathizing and sharing with their colleagues.

[32] It is relevant to consider dispersion of traffic to new bridges when setting target at the time of phase IV appraisal, however, it seems to have been difficult at that stage to concretely predict their construction (or to simulate their concrete effects). Although it is confirmed from the executing agency and local hearing results that traffic volume of Red River Bridge is dispersed to new bridges, traffic volume thought to be dispersed cannot be grasped. (Reference information) The target figure of Annual Average Daily Traffic of Nhat Tan Bridge, developed by Japanese ODA loan, after two years of completion is 65,821 PCU/day. (Nhat Tan Bridge opened in 2015)

Regional Road Management Unit 2 (hereinafter referred to as "RRMU 2") under Vietnam Road Administrative Bureau (hereinafter referred to as "VRA"), which is the subordinate organization of the Ministry of Transport. However, as a part of government's decentralization policy, jurisdiction was changed in Hanoi City. The major reason was that since both projects are located in Hanoi City, and the Ring Road is connecting to many other transport infrastructures operated and managed by Hanoi DOT, it was necessary to secure coordination and collaboration with operation and maintenance of other transportation infrastructure.

Operation and Maintenance work of both projects are handled by Transport Infrastructure Maintenance Board under Hanoi DOT, and the Board outsources actual operation and maintenance activities on site. Specifically, Hanoi Traffic Engineering 2 Joint Stock Company (hereinafter referred to as "Company 2") is in charge of operation and maintenance of Hanoi City Ring Road No.3 Construction Project on site, and Hanoi Traffic Engineering Joint Stock Company (hereinafter referred to as "Company 3") is in charge of operation and maintenance work of Red River Bridge Construction Project on site, and Transport Infrastructure Maintenance Board is supervising Company 2 and 3[33].

According to Hanoi DOT, coordination with other transportation infrastructure that form Hanoi City urban transport network became easier with more efficient decision making and collaboration with other related organizations as a result of transferring operation and maintenance of both projects to Hanoi DOT. However, specific cost norm for operation and maintenance work for both projects has not been established at the time of ex-post evaluation, and Transport Infrastructure Maintenance Board is outsourcing the work to Company 2 and 3 referring to similar road and bridge cost norms[34]. According to Hanoi DOT, the first large-scale inspection of both projects is scheduled for around 2019, and establishment of cost norm is necessary in order to carry out comprehensive repair, however, its prospect is unknown. In addition, it is pointed out that outsourcing to Company 2 and 3 has been carried out with direct contract until 2017, but competitive bidding will be introduced from 2018 onward and preparation of bid documents and selection process will take place referring to cost norms of similar roads and bridges until concrete cost norm is established. At the time of ex-post evaluation, number of staff in charge of operation and maintenance work of transportation infrastructure in Hanoi DOT is 88 (including one director and three deputy directors). According to Company 2, among 281 total staff, 21 staff are engaged

[33] Company 2 and 3 were originally under the umbrella of Hanoi DOT, but were reorganized as Joint Stock Company as part of state-owned enterprise reform by the Vietnamese government (equitization with a view to future privatization of state-owned enterprises) and thus, the works are outsourced to these companies through Transport Infrastructure Maintenance Board under Hanoi DOT.

[34] According to Hanoi DOT, cost norm of Vinh Tuy Bridge in Hanoi City is referred to for Red River Bridge.

in operation and maintenance work of Ring Road No. 3, of which 13 are technical staff. According to Company 3, among 45 total staff, 33 staff are engaged in operation and maintenance work of Red River Bridge Construction Project, of which 7 are technical staff. According to Company 2 and 3, technical staff engaged in the operation and maintenance of each project are also concurrently in charge of other tasks, and they are deployed according to the work volume.

In light of the above, it is judged that there are some problems in the institutional aspect of operation and maintenance for both projects.

3.4.2 Technical Aspect of Operation and Maintenance

Staff who have acquired sufficient technology and experiences on operation and maintenance of roads and bridges are deployed for both projects. According to Hanoi DOT, the average number of years of staff engaged in operation and maintenance of transportation infrastructure is about 15 years, and the average years of engagement of staff in operation and maintenance in Company 2 and 3 is about 17 years. According to Company 2 and 3, training is carried out every year for staff in charge of operation and maintenance by inviting experts from outside such as vocational training schools. Contents of training relate to new laws and regulations (e.g., new regulations on road signs etc.) and new technologies (e.g., ICT communication system between stakeholders, etc.) in addition to training on operation and maintenance itself. In addition, on the job training (OTJ) by senior staff to young staff is undertaken, and technology and skills of operation and maintenance are being shared. Therefore, no particular problem has been identified regarding regular repair.

On the other hand, the first large-scale inspection has not come yet (planned around 2019) for both projects, and it is unknown whether Hanoi DOT will be able to cope with the planning of comprehensive repair and technical issues in the future.

In light of above, although no particular problem has been identified concerning regular repair, there is unknown part regarding comprehensive repair which is expected to be carried out in the future. Also, since organizations responsible for operation and maintenance on site will be decided through competitive bidding after 2018, attention should be paid that Company 2 and 3 may not necessarily receive orders.

3.4.3 Financial Aspect of Operation and Maintenance

Operation and maintenance cost of roads and bridges in Hanoi City is decided based on the necessary amount of each project based on the Decision of Hanoi People’s

Committee[35]. Fund source is from the Hanoi Road Maintenance and Management Fund[36] established by Hanoi People's Committee. It is also partly sourced from the budget allocated to People's Committee from the national finance every year.

Tables 14 and 15 show the budget, actual allocation and actual expenditure of operation and maintenance costs for both projects. Although upward trend has seen for both projects, these costs cover only a part of work such as regular operation and maintenance work and repair that should be handled preferentially from the viewpoint of traffic safety etc. (For example, repair of dents and cracks on road pavement and replacement of joints of Red River Bridge. See below.) As described below (3.4.4 Status of Operation and Maintenance), heavy-duty trucks are partly obstructed, such as dropping speed at some part, and regular operation and maintenance costs are not necessarily sufficient. This is because even if budget requests for necessary amount is made regardless of the Decision No. 1531/QD-UBND, the actual situation is that sufficient allocation is not realized by Hanoi People's Committee. In addition, as mentioned above, the first large-scale inspection for both projects is planned around 2019, and it is assumed that comprehensive repair will be carried out every five years, however, necessary cost norm has not been established and there is no concrete prospect of budgeting and securing budget.

Table 14: Operation and Maintenance Cost of Red River Bridge Construction Project

(Unit: million VDR)

	2015	2016	2017
Budget (Requested Amount)	10,000	10,500	11,000
Actual Allocation	10,000	10,500	11,000
Actual Expenditure	10,000	10,500	11,000

Source: Results from questionnaire survey of Hanoi DOT

Note 1) For budget, actual allocation and actual expenditure of each year, 3,000 million VND is sourced from the national account, and the remaining is allocated from Hanoi Road Maintenance and Management Fund.

[35] Decision No. 1531/QD-UBND, March 3, 2017.
[36] Hanoi Road Maintenance and Management Fund is a non-profit national fund, sourcing from the Central Road Maintenance Fund, Road Usage Charge, and Road Usage Fee. Based on Decision No.1174/QD-UBND (February 27, 2014)

Table 15: Operation and Maintenance Cost of Hanoi City Ring Road No.3 Construction Project

(Unit: million VDR)

	2015	2016	2017
Budget (Requested Amount)	9,000	10,000	11,500
Actual Allocation	9,000	10,000	11,500
Actual Expenditure	9,000	10,000	11,500

Source: Results from questionnaire survey of Hanoi DOT

Note 1) For budget, actual allocation and actual expenditure of each year, 3,000 million VND is sourced from the national account, and the remaining is allocated from Hanoi Road Maintenance and Management Fund.

In anticipation of increase in traffic volume in the future, current budget is not sufficient for appropriate operation and maintenance, and further budget needs to be secured.

Therefore, it is judged that there are some problems with respect to financial aspect of operation and maintenance.

3.4.4 Status of Operation and Maintenance

According to interviews with Company 2 and 3 and project site survey during the field study, pavement dents and cracks are seen due to increased traffic volume and passage of overloaded vehicles, and repair with plastic cement is carried out. In addition, according to hearing to Company 3 and project site survey, deterioration of rubbers[37], expansion device, at the joint of Red River Bridge is progressing, and it is necessary to replace them with steel one after another. Although 15 places have already been replaced, it is pointed out that it takes time to replace all the remaining 13 rubbers due to budget constraint. According to interviews with companies, it is pointed out that heavy-duty trucks are dropping speed at the deteriorated parts.

As mentioned above, operation and maintenance work mainly focuses on regular work and repairs that should be handled preferentially from the viewpoint of traffic safety. Specifically, inspections of pavement road surfaces, traffic signs, fences, bridges and roads in general are carried out, and inspections of bridge end vertical girders (stringers) etc. are conducted on a monthly basis.

Major spare parts are concrete, asphalt, plastic cement and they are stored in the warehouse of Company 2 and 3. In addition, steel material of expansion device at the joint of Red River Bridge can be obtained in 12 to 15 days after placing order. All the

[37] Lifespan of rubber expansion device is said to be about 5 years.

spare parts can be procured in Vietnam, and they have been available in a timely manner so far.

In light of the above, there are some issues that have not been able to cope with regarding operation and maintenance, due to budget constraints.

Some minor problems have been observed in terms of the institutional aspect and financial aspect. Therefore sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

Both projects aimed to respond to the increasing traffic demands in Hanoi City and the surrounding areas through the construction of Red River Bridge, New Phu Dong Bridge and Phap Van Viaduct of the Hanoi City Ring Road No. 3 by "Red River Bridge Construction Project (I) (II) (III) (IV)", and through the construction of a road in the section between its intersection with National Highway No. 32 and the North of Linh Dam Lake by "Hanoi City Ring Road No.3 Construction Project". Both projects aimed at eliminating the bottleneck of road traffic in Hanoi City and improving logistics efficiency are consistent with the country's development policy, development needs as well as with Japan's ODA policy that set out support for economic infrastructure development. Therefore, the relevance of the projects is high. With regards to efficiency, it is judged to be fair when both projects are summed as one project. Regarding project effectiveness, when taking into account the analysis results on quantitative effects of both projects (for Red River Bridge Construction Project, the actual traffic volume was a little lower than 80% of the target value at one point, however, when considering that it is the traffic volume after the traffic was dispersed to other new bridges which were developed after the appraisal of the project, it can be regarded that the target has been sufficiently achieved. The actual result of time saving greatly exceeded the target values for all of the three measurement points. For Hanoi City Ring Road No.3 Construction Project, the actual traffic volume is slightly less than 80% of the target value, however, it is judged that it has achieved sufficiently when taking into consideration the results of hearings to beneficiaries. The actual result of time saving greatly exceeded the target value set at the time of appraisal) as well as results of interviews with beneficiaries, it can be considered that both projects are contributing to alleviating traffic congestion in Hanoi City and improving logistics in the northern part of Vietnam. In addition, impact that both projects contribute to the development of the regional economy by securing smooth road transport is also seen; thus, effectiveness and impact are high. No particular big problem has been reported on the impact on natural environment, and resettlement and land acquisition process has been

properly implemented based on the relevant regulations in Vietnam and thus there is no problem. Regarding operation and maintenance, some minor problems have been observed in terms of the institutional aspect and financial aspect. Therefore sustainability of the effects generated by both projects is fair.

In light of the above, both projects are 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

Points to be noted when setting operation and effect indicators at the time of appraisal for new projects

Regarding operation indicator of Red River Bridge Construction Project, the actual traffic volume was a little lower than 80% of the target value at one point (Red River Bridge). This is because traffic volume was dispersed to other new bridges which were developed after phase IV appraisal of the project. However, it can be inferred that it was difficult at the time of phase IV appraisal to specifically predict such new construction (or to simulate concrete influence) when setting the target values. Normally, road and bridge construction projects are to develop a part of the entire road transport network. Therefore, it is relevant to take into consideration other road and bridge development plans that may affect the effectiveness of the project in the future when setting target values of operation and effect indicators. Therefore, it is important that JICA confirms the target values of operation and effect indicators to the executing agency and formulate common recognition with them with sufficient consideration of future road transport network development plans etc., at the time of appraisal of new road and bridge construction projects.

Necessity of sufficient institution development prior to business transfer

In Vietnam, decentralization policy is progressing, and delegation of authority has been carried out to subordinate government organizations and local authorities. For both projects, operation and maintenance work after project completion has been transferred to Hanoi DOT under Hanoi People's Committee, not RRMU 2 under VRA within the Ministry of Transport, that had been assumed at the time of appraisal. As a result, coordination with other transportation infrastructure that form Hanoi City urban transport network became

easier with more efficient decision making and collaboration with other related organizations. However, problems also occurred on the other hand. Cost norm for operation and maintenance work specifically for both projects has not been established by Hanoi People's Committee at the time of ex-post evaluation. For this reason, if this goes on, there is a fear that large-scale inspection and comprehensive repairs cannot be carried out, and Hanoi DOT will be able to implement only a part of work such as regular operation and maintenance work and repair that should be handled preferentially from the viewpoint of traffic safety etc. Therefore, not only for the case of decentralization, but also when transferring authority of operation and maintenance work of projects that were developed and completed by JICA support or transferring responsible work to local authorities etc., (i.e., when project execution agency and operation and maintenance agency are different), it is important that government establishes sufficient system for implementing necessary work (development of institutional aspects such as personnel, decision making, coordination with related organizations, cost norms etc.) and sufficient mechanism for securing and executing budget before project completion so that transferred operation and maintenance work will be carried out without problems.

End

Comparison of the Original and Actual Scope of the Projects

Item	Plan	Actual
1. Project Outputs	Red River Bridge Construction Project (I) (II) (III) (IV) 1) Civil Work a) Bridge Construction ・ Red River Bridge (New Construction) Bridge Length: 3.1km, Number of Lanes: out-bound/in-bound 6 lanes b) Approach Road (New Construction) ・ Thanh Tri Section (section between National Highway No.1 and Red River Bridge) Bridge Length: 6.6km, Number of Lanes: round-trip 4 lanes, Number of Interchanges: 3, Toll plaza: 1 ・ Gia Lam Section (section between National Highway No.5 and Red River Bridge) Bridge Length: 3.6km, Number of Lanes: round-trip 4 lanes, Number of Interchanges: 2 ・ Total number of bridges for Thanh Tri Section and Gia Lam Section: 7 c) Development of Infrastructure in Resettlement Area ・ Infrastructure development in resettlement areas (6 places) (road, drainage, distribution line, water supply etc.) 2) Consulting Services ・ Assistance in tendering and construction supervision etc. ・ Provision of training to maintenance engineers,	Red River Bridge Construction Project (I) (II) (III) (IV) 1) Civil Work a) Bridge Construction ・ As planned <Additional scope> ・ Phap Van Viaduct construction (new construction) and partial extension ・ New Phu Dong Bridge widening b) Approach Road (New construction) ・ Thanh Tri Section (Cancellation of toll plaza in 1 place. Others are as planned) ・ Gia Lam Section (as planned) ・ Bridges for Thanh Tri Section and Gia Lam Section were changed to 4 bridges, 2 flyovers and 1 viaduct c) Development of Infrastructure in Resettlement Area ・ Infrastructure development in resettlement areas (10 places) (road, drainage, distribution line, water supply etc.) 2) Consulting Services ・ As planned ・ As planned

	preparation of maintenance manual, assistance in environmental measures Hanoi City Ring Road No.3 Construction Project 1) Civil Work ・ Ring Road No.3 major road: Total Length: 8.9km (of which length of viaduct: about 8.5km) Number of Lanes: 4 lanes ・ Interchange construction: 3 places 2) Consulting Services ・ Detailed design and assistance in tendering ・ Construction supervision	 Hanoi City Ring Road No.3 Construction Project 1) Civil Work ・As planned ・As planned <Additional scope> ・ Underpasses: 2 places ・ Flyover: 1 place 2) Consulting Services ・As planned ・As planned
2. Project Period	Red River Bridge Construction Project (I) March, 2000 – August, 2005 (66 months) Hanoi City Ring Road No.3 Construction Project March, 2008 – December, 2011 (46 months)	Red River Bridge Construction Project March, 2000 – May, 2018 (219 months) Hanoi City Ring Road No.3 Construction Project March, 2008 – July, 2016 (101 months)
3. Project Cost Amount Paid in Foreign Currency Amount Paid in Local Currency Total ODA Loan Portion Exchange Rate	Red River Bridge Construction Project (IV) 19,969 million yen 38,962 million yen (5,542,248 million VND) 58,931 million yen 40,989 million yen 1VND=0.00703 yen (As of October, 2005)	Red River Bridge Construction Project — — — 54,368 million yen 39,153 million yen 1VND=0.005897 yen (Average between 2000 and 2017)

	Hanoi City Ring Road No.3 Construction Project	Hanoi City Ring Road No.3 Construction Project
Amount Paid in Foreign Currency	11,334 million yen	－
Amount Paid in Local Currency	21,999 million yen （2,898,419 million VND）	－ －
Total	33,333 million yen	24,787 million yen
ODA Loan Portion	28,069 million yen	22,741 million yen
Exchange Rate	1VND=0.00759 yen (As of October, 2007)	1VND=0.004926 yen (Average between 2008 and 2017)
4. Final Disbursement	Red River Bridge Construction Project (I): July, 2007 Red River Bridge Construction Project (II): July, 2011 Red River Bridge Construction Project (III): August, 2010 Red River Bridge Construction Project (IV): August, 2017 Hanoi City Ring Road No.3 Construction Project: January, 2017	

End