

JBIC ODA Loan Project Mid-Term Review 2006

Evaluator: Yasuhisa Kuroda (OPMAC)
Time of Mid-Term Review Field Survey: March 2007

Project Title: Vietnam “Bai Chay Bridge Construction Project” (L/A No. VNIX-1)

[Loan Outline]

Loan Amount / Contract Approved Amount / Disbursed Amount: 6,804 million yen / 6,508 million yen / 6,012 million yen (as of March 2007)

Loan Agreement: July 2001 (5 years after L/A signing)

Project Completion Date: December 2006

Loan Expiry Date: May 2008

Executing Agency: Ministry of Transport, Project Management Unit No. 18

Operation and Maintenance Agency: Bai Chay Bridge and Ferry Management Company, Government of Quang Ninh Province

Selection Criteria for Mid-Term Review: Special Yen loan

[Project Objective]

The objective of this project is to build a 25.3 meter wide, 903 meter long 4-lane PC cable stayed bridge over Cua Luc Strait and an approach road in the city of Ha Long, Quang Ninh Province, 160 km east of Hanoi, the capital of Vietnam. The bridge and the approach road will make freight and passenger transport on the National Highway No. 18 smoother and more efficient, thereby contributing to the social and economic development of the region.

Consultant: J/V comprised of Japan Bridge & Structure Institute, Inc.; Pacific Consultant International; Hyder Consulting-CDC, Ltd. (Britain) – Transport Engineering Design Incorporation (Belgium); (employment is based on L/A No. VNV-6: National Highway No. 18 Improvement Project I)

Contractor: J/V comprised of SHIMIZU CORPORATION and SUMITOMO MITSUI CONSTRUCTION CO., LTD.

[Mid-Term Review Result]

Item	Ex-ante Evaluation (at the time of appraisal) (January,2001)	Result of mid-term review and ex-post evaluation results as estimated at the time of mid-term review
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Relevance		
(1) National policy level	<p>(1) National policy level</p> <p>In Vietnam, the road sector plays an important role in domestic freight and passenger transport. Road transport accounts for 65% of total freight and 81% of total passenger transport (as of 1999). The road sector is given a high priority in the “National Traffic Development Master Plan (which was adopted in the “Strategic Survey of the Development of Vietnamese National Transport and Traffic” conducted by JICA in July 2000). Additionally, in the Public Investment Plan (1996–2000), the estimated amount earmarked for the transport sector accounts for one fourth of the total. The largest portion of the transport sector investment was allotted to the road sector.</p>	<p>(1) National policy level</p> <p>On the national policy level, the transport sector has continued to be regarded as an important sector. It was confirmed that 27% of the state budget was invested in the transport and communication sector during the five years from 2000–2005. Continuing to cite infrastructure investment as a priority item on the national policy level, the “Five-Year Social and Economic Development Plan (2006–2010), points out specifically that efforts will be focused on the development of transport infrastructure. In the area of roads, the Plan cites as priority items (i) the provision and expansion of a national highway network, and (ii) the provision of a transport system in the priority region for economic development. In the long-term development plan, important national projects are cited in the appendix table as “important projects,” and this project is listed in the section for ODA target projects. Thus, their importance as national projects is confirmed.</p>
(2) Policy level	<p>(2) Policy level</p> <p>The road system in Vietnam covers a wide range of areas and its road density compares favorably with that found in other ASEAN member nations. However, the aging of the road system, due to inadequate maintenance, is becoming very serious. However, traffic volume centering on the main roads is increasing sharply. Also, the bridges are deteriorating so fast that many are forced to set limits on the volume of traffic that is allowed to cross them. Moreover, there are many points along the main national highways where vehicles have to be ferried across rivers. Consequently, bridge construction has become an urgent task.</p>	<p>(2) Policy level</p> <p>In the transport sector, in response to the Five-Year Social and Economic Development Plan (2006–2010), in August 2005, the Ministry of Transport formulated the “Five-Year Transport Sector Development Plan (2006–2010)” and began implementing the Plan. The Plan specifically calls for the provision of National Highway No. 18 and the completion of the Bai Chay Bridge.</p> <p>From the viewpoint of regional development, the Five-Year Social and Economic Development Plan (2006–2010) designated the Red River delta region that includes Quang Ninh Province as a priority target for development and adopted the policy of focusing on industrial and tourism development. On the industrial development front, the Plan cited the development and promotion of the area along National Highway Nos. 18, 5, 1 and 10 as well as the development</p>

<p>(3) Planning level</p>	<p>(3) Planning level</p> <p>The triangle zone encompassing Hanoi, Hai Phong and Ha Long (Quang Ninh Providence) is regarded by the Government of Vietnam as a priority area for development, and the National Highway No. 18, a major artery in northeastern Vietnam, is an important traffic artery in the triangle zone. Since there is no bridge over Cua Luc Strait (an inlet to the Bai Chay Bay), freight and passenger traffic resort to the ferryboat service. Ever expanding traffic volume in recent years, however, is pushing the transportation capacity of ferry traffic to its limit, thus causing impediments to efficient transport on National Highway No. 18. In addition, expansion of Cai Lan Port inside Cua Luc Bay is expected to increase the number of large-size ships passing through the Strait. The large-size ship route cuts across that of ferryboats, so there is a need to eliminate the threat to maritime safety such crossing poses. This danger must be eliminated. The Government of Vietnam therefore regards the present project as a top priority project.</p>	<p>and promotion of the industrial area on Van Don Island. On the tourism development front, the Plan called for the development and promotion of tourist sites including those in Ha Long and Cat Ba. The importance of the project continued to be confirmed for both sector and regional developments.</p> <p>(3) Planning level</p> <p>Accompanying the regional economic development, traffic volume on National Highway No. 18 has increased, and so has the ferry service across the Cua Luc Strait. In 2006, ferryboats crossed the strait 719 times per day, thus pushing the transportation capacity of the ferries to its limit. Since there is so much traffic congestion at ferry terminals and the number of trucks – the linchpin of freight distribution – that each ferryboat can carry is limited, the length of time spent waiting for the next ferryboat has become extremely long, thus causing impediments to efficient transport on the National Highway No. 18. The need to construct a bridge over Cua Luc Strait for regional economic development was therefore recognized. Since Cua Luc Strait is situated in the buffer zone of Ha Long Bay, a World Natural Heritage site, the government of Quang Ninh Province implemented a basic policy of balancing industrial development with the preservation of natural resources. In Cua Luc Strait, there are many marine disasters caused by congested ferry traffic. Thus improving the safety of vessels passing through the strait was confirmed as another important task of the present project</p> <p>Under this project, JBIC provided Special Yen Loans. In a bid to help the early recovery of Asian economies hit hard by the economic crisis, the Special Yen Loan was established in December 1998, and its primary purposes included promoting projects that are highly</p>
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		<p>effective in boosting the economy and increasing employment, creating an attractive business environment for private investment, and implementing economic structural reforms by improving productivity. Special Yen Loans are extended under more concessional conditions than ordinary loans to support the interested states.</p> <p>Under the Bai Chay Bridge Construction Project, a bridge will be constructed over Cua Luc Strait (an inlet to the Bai Chay Bay) that now forms a traffic bottleneck on the National Highway No. 18, a major artery in northern Vietnam. The project is expected to contribute to more efficient freight distribution in this region by replacing the existing ferryboat transportation, thereby upgrading the investment environment in the northern part of the country. Because of its high level of necessity and urgency and high degree of maturation, the provision of the Special Yen Loan deserves the earliest possible implementation.</p>																																
<p>Effectiveness (Impact) (1) Operation and effect indicators</p>	<p>(1) Operation and effect indicators (a) Quantitative effects 1) Traffic volume on Bai Chay Bridge</p> <table border="1" data-bbox="434 951 1232 1353"> <thead> <tr> <th></th> <th>2000 Actual (At the time of ex-ante evaluation)</th> <th>2005 Estimate</th> <th>2020 Target</th> </tr> </thead> <tbody> <tr> <td>Traffic volume (vehicle/day)</td> <td></td> <td>11,195</td> <td>77,079</td> </tr> <tr> <td>Transport time saving (¥1000 /year*1)</td> <td></td> <td>64,422</td> <td>693,067</td> </tr> <tr> <td>Cost in terms of AASHO benchmark cost-benefit ratio (%) *2</td> <td></td> <td>16.1</td> <td>173.3</td> </tr> </tbody> </table> <p>Note: *1. It is estimated that the transit time will be reduced by 25</p>		2000 Actual (At the time of ex-ante evaluation)	2005 Estimate	2020 Target	Traffic volume (vehicle/day)		11,195	77,079	Transport time saving (¥1000 /year*1)		64,422	693,067	Cost in terms of AASHO benchmark cost-benefit ratio (%) *2		16.1	173.3	<p>(1) Operation and effect indicators (a) Quantitative effects 1) Traffic volume on Bai Chay Bridge</p> <table border="1" data-bbox="1299 960 2096 1362"> <thead> <tr> <th></th> <th>Estimate for 2007 (at the time of mid-term review)</th> <th>2010 Target</th> <th>2020 Target</th> </tr> </thead> <tbody> <tr> <td>Traffic volume (vehicle/day) *1</td> <td>10,373 *2</td> <td>14,696 *3</td> <td>36,485 *4</td> </tr> <tr> <td>Transport time saving (1000 yen /year)</td> <td>*5</td> <td></td> <td></td> </tr> <tr> <td>Cost in terms of AASHO benchmark cost-benefit ratio (%)</td> <td>*5</td> <td></td> <td></td> </tr> </tbody> </table> <p>Notes *1 Two-wheel vehicles, excluding bicycle</p>		Estimate for 2007 (at the time of mid-term review)	2010 Target	2020 Target	Traffic volume (vehicle/day) *1	10,373 *2	14,696 *3	36,485 *4	Transport time saving (1000 yen /year)	*5			Cost in terms of AASHO benchmark cost-benefit ratio (%)	*5		
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	<p>minutes due to the project implementation.</p> <p>*2. AASHO: American Association of State Highway Officials Source: JBIC domestic record</p>	<p>*2 The traffic volume over a 3-month period from January to March 2007 has been multiplied by four and then converted to per day traffic volume.</p> <p>*3 The average annual rate of increase for 2007-2010 calculating back from the traffic volume was 12.3%.</p> <p>*4 Calculating back from the traffic volume, the average annual rate of increase from 2010–2020 was 9.5%.</p> <p>*5 There are no performance data available.</p> <p>Source: Department of Transport, Quang Ninh Province</p> <p>In the mid-term review, it was already confirmed right after the Bai Chay Bridge was open to traffic that the actual volume of vehicular traffic would be double the available ferry transportation service. In Quang Ninh Province, although the average actual volume of traffic recorded from January to March was adopted as the traffic volume for 2007, generally speaking, after a road or a bridge is open to traffic, accompanying the spread of traffic information, for a while there will be a spike in traffic volume. Consequently, it can be assumed that the actual annual traffic volume will exceed the Quang Ninh provincial government's projection. As a matter of fact, a look at the actual monthly traffic volume after the road and the bridge were open to traffic reveals that while, in February 2007, it increased by 5% over the previous month, in March, it jumped by 11% over the previous month, thus corroborating the impression of rapid increase in traffic volume (8% on average).</p> <p>The average annual rates of increase in traffic projected by Quang Ninh Providence for 2007–2010 and 2010–2020 were 12.3% and 9.5%, respectively, which are more conservative than the growth rate of the regional economy. Since the size of traffic volume affects the scale of the fare receipt and the scale of the state coffer payment, it is essential that projections of traffic volume be appropriate. In Vietnam, in keeping</p>
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with the rise in the level of income, motorization is expected to progress, and during a period of economic growth, it is generally assumed that the rise in the amount of traffic will be about the same as the growth rate of the regional economy in question. Thus it is determined that the aforementioned traffic volume projected by Quang Ninh Province needs to be revised.

A review of the traffic volume projection by the evaluator of the mid-term review was attempted (during the period from April 2007 to June 2007, that is, six months after the Bai Chay Bridge was open to traffic, traffic volume was hypothesized to have increased every month over the previous month by 8%, and by taking into consideration the regional GDP growth rate (from 2006 to 2010) that will be discussed in 3), the subsequent rate of increase was hypothesized to have increased annually by 13%). Based on that projection, it was concluded that the traffic volume would be 13,414 vehicles/day in 2007, 20,829 vehicles/day in 2010, and 70,708 vehicles/day in 2020. It was confirmed that the projection for 2020 would reach a level near that of the original plan.

2) Ferry service and traffic volume across Cua Luc Strait

	2002	2003	2004	2005	2006 *1	2007 (Estimate)
Actual ferry service (per day)	464	521	592	648	719	0
Total number of vehicles transported (per day)	2,342	3,070	3,968	4,540	4,870	0
Number of ferry accidents (per year)	0	0	1	1	2	0
Number of ferry accident victims (per year)	0	0	0	0	3	0

Note *1 Actual performance from January to November

Source: Department of Transport, Quang Ninh Province

Just prior to the opening of the Bai Chay Bridge to traffic on December 2, 2006, ferry service was provided around the clock with, on average, 30 crossings per hour, with the total number of vehicles transported increasing to double the scale of 2002. Although ferry service continues to be provided on a small scale even after the Bai Chay Bridge was open to traffic in December 2006, the service was terminated for good on March 15, 2007. As a result, accidents associated with the ferry service were completely eliminated.

3) Long-term Social and Economic Development Plan Set up by Quang Ninh Province

	2005 (Actual)	2006–2010 Average annual growth rate	2010–2020 Average annual growth rate
Population growth rate (annual average %)	1,070 thousand people	1.00%	0.95%
Average annual regional GDP*1 growth rate (1994 fixed cost)	6,229 Bill. VND	13%	14.2%

Note *1 In Vietnam, each ministry drafts a plan for economic growth rate, compiles statistical data for the plan, and announces it. (Decision No. 305/2005/QĐ-TTg of Prime Minister dated Nov. 24, 2005)

Source: Department of Planning & Investment, Quang Ninh Province, “Master Plan for Socio-Economic Development of Quang Ninh Province up to 2010 and orientation to 2020”

Quang Ninh Province, which forms one part of an economic triangle encompassing Hanoi, Hai Phong and Quang Ninh, is one of the priority development regions of Vietnam. In the Quang Ninh Long-Term Social and Economic Development Plan, the average regional GDP growth rate is set at 13% for 2006–2010 and 14.2% for 2010–2020. These high growth rates should be fully taken into consideration when projecting

<p>(2) Factors which may influence the effectiveness and impact</p>	<p>(b) Qualitative effects</p> <p>1) Distribution of goods in the northeastern economic zone encompassing Hanoi, Hai Phong and Ha Long (Quang Ninh Province) will be streamlined.</p> <p>2) Safety of navigation of large vessels through the Cua Luc Strait will be enhanced.</p> <p>(2) Factors which may influence the effectiveness and impact</p> <p>(a) Environmental consideration</p> <p>Since the project is being implemented in the buffer zone of the World Natural Heritage Site in Ha Long Bay, an environmental measures program, which includes landscape protection measures through partial afforestation of the approach section, will be implemented.</p>	<p>traffic volume on the Bai Chay Bridge.</p> <p>(b) Qualitative effects</p> <p>1) Streamlining of the distribution of goods</p> <p>In the northeastern economic zone, the average annual growth rate in production volume in manufacturing from 2000-2005 (1994 fixed price) was 18.3% in Hanoi City, 17.2% in Hai Phong City, and 14.9% in Quang Ninh Province. High growth rates are shown in these areas compared to the national average (16.0%). Streamlining of distribution of goods is indispensable to support such high growth rates. Thus it is recognized that the provision of Japanese ODA Loan for the infrastructure development of National Highways No. 5, No. 10, No. 18 and No. 1 (bridge is the target of support), Binh Bridge, Hai Phong Port, Cai Lan Port, etc. has contributed significantly to these high growth rates (World Bank, "Impact Assessment of Large Scale Transport Infrastructure in North Vietnam," 2004). The location of Bai Chay Bridge allows it to maintain a close link with these infrastructure building projects. It is recognized that these infrastructure building projects are contributing to streamlining of the distribution of goods in an integrated manner.</p> <p>2) Safety of the navigation of large vessels through the Cua Luc Strait</p> <p>As pointed out in (a) – paragraph 2), the ferry service was completely halted on March 15, 2007. The possibility of marine accidents occurring at the intersection of large vessel routes and ferry routes has been effectively eliminated.</p> <p>(2) Factors which may influence the effectiveness and impact</p> <p>(a) Environmental consideration</p> <p>As for the environment, prior to the project implementation, the Environmental Impact Assessment (EIA) was conducted, and in response to UNESCO comments, measures for dealing with</p>
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	<p>(b) Land acquisition and resident relocation Area of land acquisition: 60,080 m² Resident relocation: about 170 households Resident relocation of will be implemented in accordance with Vietnam's domestic law (Decree 22/1998/ND-CP). An agreement has already been reached between JBIC and the executing agency stipulating the completion of land acquisition and resident relocation as a prerequisite for allowing companies to take part in the bidding for this project.</p>	<p>environmental issues were formulated on the basis of the EIA. The executing agency installed environmental monitoring units and implemented measures for conserving the environment based on the results of the EIA. The agency monitored the effects of those measures during the construction period. Thanks to these efforts, no particular problem has arisen. In order to compensate for the area that will be logged under the project, mangroves were planted in an area equivalent to or larger than the area in Cua Luc Bay that was logged, and at the same time, mangroves were also planted in the main bridge pier section. While the planting of the mangroves in the approach road section was delayed, it is recognized that sufficient consideration was taken to implement the environmental measures. It is desirable in the future to ascertain what percentage of the mangrove forest planted actually took root.</p> <p>In addition, since the site of the project is located in the buffer zone of a World Heritage, there was concern that the project might be a blot on the landscape. Consequently, prior to the start of construction, montage photos of the bridge were prepared and made public, and interested parties were asked to voice their views.</p> <p>(b) Land acquisition and resident relocation There were 478 households that were directly impacted by the project, 162 of which were targeted for relocation (Note: total number from BC-1 to BC-3). Resident relocation and land acquisition were completed before the bidding, as planned. No particular problem arose, but it is desirable that the post-relocation livelihood situation of the inhabitants be ascertained. The inhabitants who were targeted for relocation were given land in a zone within the city of Ha Long called Yet Kieu some 1.5 km from the existing residential area. Quang Ninh Province developed this zone and provided on average 67.5 square meters of land per household.</p>
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	<p>(c) Social consideration</p> <p>1) Provision of bus services is being planned to enable local residents, who now use ferry boats, to cross the river.</p> <p>2) As an employment measure, those now working at the ferry service company that will cease to operate when this project is completed will be asked to work in the operation and maintenance of the Bai Chay Bridge.</p>	<p>Note: The Bai Chay Bridge Construction Project was implemented by dividing the project site into three construction zones: BC-1, BC-2, and BC-3. Of the three construction zones, BC-2 was targeted for the Japanese ODA Loan Bai Chay Bridge Construction Project (VNIX-1), the other two zones were being implemented by the Japanese ODA Loan National Highway No. 18 Improvement Project I (VNV-6) and II (VNVII-6).</p> <p>(c) Social consideration</p> <p>1) Accompanying the opening of the Bai Chay Bridge to traffic, two routes operated by a bus company under the umbrella of the provincial government (BC-1 – Cam Pha Section: bus service provided 8 times a day on average; and BC-3-Hoang Bo Section, bus service provided 7 times a day on average) are added. A bus service on the 3rd route (between Ha Long-Uong Bi) is scheduled to be added soon.</p> <p>2) In February 2005, the ferry service company was renamed to the Quang Ninh Bridge & Ferry Management Company. As a measure for hiring employees, JBIC obtained government approval for undertaking the management as well as the operation and maintenance of the Bai Chay Bridge, and of the 373 employees, 226 were assigned as personnel required for the management as well as operation and maintenance of the renamed company.</p> <p>(d) Slope protection of approach road</p> <p>With regard to the approach road and related access roads of the Bai Chay Bridge being built under the National Highway No. 18 Improvement Project (I) (II), the construction schedule was delayed due to various factors, including the increase in earthwork volume. Since April 2007, the executing agency has been implementing engineering works on slope protection of roads for promoting</p>
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		<p>environmental conservation. The said works both in BC-1 and BC-3 zones are slated to be completed by September 2007.</p> <p>(e) Intersection of Loang Thong In the completed zone of the approach bridge on the Hongai side (at the end of the zone driving non-stop after going through the tollgate installed at BC-1), there is a point where Provincial Road Nos. 336 and 337 cross (the Loang Thong intersection); a stoplight is provided at the intersection.. This zone slopes downward, so it is easy for vehicles running in this zone to accelerate, which has prompted people to point out the risk of accidents occurring in this zone. Appropriate measures should be taken to manage the stoplight and methods for paving the slope zone so that it will be more difficult to accelerate should be devised.</p> <p>(f) Road maintenance and improvement up to Moncai, located east of Cua Ong (on the Chinese border) Implementation of the National Highway No.18 Improvement Project is halted at Cua Ong, 38 km east of Hong Hai. The building of the approximately 130 km of road that runs east from Cua Ong to Mong Cai (on the Chinese border) is critically important for economic growth of the region. The construction of this road will further increase the effectiveness of the Bay Chay Bridge. Additionally, it is said that many entrepreneurs in Moncai hail from Hai Phong, and in the past, ferryboats were widely used to venture forth from Moncai. In the future, however, it is assumed that the mode of transport will shift to road transport. From this, it can also be assumed that the Bai Chay Bridge will function effectively for the economic development of this region.</p> <p>(g) Van Don Island district development Van Don Island, located in the eastern part of Quang Ninh Province, has</p>
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<p>(3) Factors which may influence the sustainability</p>	<p>(3) Factors which may influence the sustainability (a) Operation and maintenance system After the project is completed, the Vietnam Road Administration of the Ministry of Transport will execute the operation, maintenance and management of the project. A Regional Road Administration Unit is set up in the VRA for each target area. The 2nd Regional Road Administration Unit, which has jurisdiction over the northern area of Vietnam, is</p>	<p>a lush natural environment, and is designated as an area to be development. The provincial government is promoting a development plan that embraces both manufacturing and tourism. The development of this district will enhance the effectiveness of the Bai Chay Bridge.</p> <p>(h) Promotion of industrial park areas There are a host of industrial park areas in the province of Quang Ninh, including Cai Lan, Cam Pha, Viet Hung, Hai Yen, Dong Mai, Chao Khe, Mong Cai, Kim Sen, Ohuong Nam, Tien Yen, Ninh Duong, and Uong Bi. The provincial government is promoting the development of these industrial park areas. With the promotion of these industrial park areas, the effectiveness of the Bai Chay Bridge will be enhanced that much more.</p> <p>(i) Development of tourism in Ha Long Bay Today, tourism in Ha Long Bay is moving toward the island of Cat Ba on the western side of the bay. The oddly-shaped rock outcroppings, which have been declared a World Natural Heritage Site, have spread not only to the western part of the bay but also to the eastern part as well. Although the eastern part of the bay has not been included among the tourism development targets, in the future, when tourism development is implemented in the eastern part of the bay, the Bai Chay Bridge will play a major role as a passage connecting the eastern part of the bridge to the western part. Consequently, the heightening of its effectiveness can be envisioned.</p> <p>(3) Factors which may influence the sustainability (a) Operation and maintenance system The operation and maintenance system is under the jurisdiction of the Vietnam Road Administration of the Ministry of Transport. In response to the request from the provincial government of Quang Ninh, the</p>
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	scheduled to be put in charge of the present project.	<p>Ministry of Transport commissioned Quang Ninh Bridge & Ferry Management Company, which was created by reorganizing Ferry Service Company, to take charge of the operation and maintenance of the Bai Chay Bridge (Ministry of Transport Decision No. 2366/QD-SGTVT dated November 28, 2006). Under the consignment contract, the contractor of this project will direct the operation and management of the Bai Chay Bridge and the approach road. Quang Ninh Bridge & Ferry Management Company will request the central government (via the Vietnam Road Administration of the Ministry of Transport) through the provincial government of Quang Ninh to provide the budget necessary for the operation and maintenance of the project. After receiving the budget request, the Ministry of Finance will allocate the amount requested from the government budget to the province of Quang Ninh. The operation and maintenance budget is set pursuant to the standard established by the government, and a specific amount is allocated in accordance with the specifications of roads and bridges and the distance involved. It is important that an adequate budget be secured for operation and maintenance. The toll for crossing bridges is set based on the toll system set up by the government in accordance with the specifications of the nation's bridges targeted by the government (Ministry of Finance Notification No.90/2004/TT-BTC dated September 7, 2004). Some (20%) of the toll collected may be reserved to cover the cost of operation and maintenance and to fund technical innovations in operation and maintenance, but most of it is stored in the state coffers.</p>
<p>[[Efficiency] (1) Outputs</p>	<p>(1) Outputs A main bridge (including 1 approach bridge) will be constructed over Cua Luc Strait and an approach road (including 8 approach bridges) will be built linking the bridge to National High No. 18. However, the Japanese ODA Loan targeted by the project “Bai Chay Bridge Construction</p>	<p>(1) Outputs The main bridge section (including 1 approach bridge) was built according to the same specifications and type as in the original plan. As for the approach road section, except for the change in the number of bridges to 4 bridges on the Bai Chay side, the approach road was</p>

<p>(2) Project period</p> <p>[Results of Special Yen</p>	<p>Project” (VNIX-1) applies to only the main bridge section. The approach road section and the consulting service are covered by the Japanese ODA Loan “National Highway No. 18 Improvement Project (I)(II)” (VNV-6, VNVII-6), which is not targeted in this mid-term review.</p> <p>□ Main bridge section (dealt with in the present project)</p> <table border="1" data-bbox="439 359 1240 703"> <thead> <tr> <th></th> <th>Specification item</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Main bridge</td> <td>Total length</td> <td>903 m</td> </tr> <tr> <td>Number of lanes</td> <td>4 lanes (2 lanes on each side)</td> </tr> <tr> <td>Total width</td> <td>25.3 m</td> </tr> <tr> <td>Navigation ceiling</td> <td>50 m</td> </tr> <tr> <td>Type</td> <td>PC cable stayed bridge</td> </tr> <tr> <td rowspan="4">Approach bridge</td> <td>Total length</td> <td>99 m</td> </tr> <tr> <td>Number of lanes</td> <td>4 lanes (2 lanes on each side))</td> </tr> <tr> <td>Total width</td> <td>23 m</td> </tr> <tr> <td>Type</td> <td>PC box girder bridge</td> </tr> </tbody> </table> <p>□ Approach road section (dealt with in VNV-6, VNVII-6)</p> <table border="1" data-bbox="439 767 1240 1038"> <thead> <tr> <th></th> <th>Specification item</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Total length</td> <td>Bai Chay side</td> <td>3,292 m (including 5 bridges))</td> </tr> <tr> <td>Hongai side</td> <td>4,594 m (including 3 bridges)</td> </tr> <tr> <td>Lane</td> <td></td> <td>4 lanes (2 lanes on each side) But there are 2 lanes for the access roads (1 lane on each side)</td> </tr> <tr> <td>Width</td> <td></td> <td>29 m (but access road is 9m)</td> </tr> </tbody> </table> <p>(2) Project period July 2001 – October 2006 (63 months)</p> <p>The significance of the Special Yen Loan at the time it was provided</p>		Specification item	Specification	Main bridge	Total length	903 m	Number of lanes	4 lanes (2 lanes on each side)	Total width	25.3 m	Navigation ceiling	50 m	Type	PC cable stayed bridge	Approach bridge	Total length	99 m	Number of lanes	4 lanes (2 lanes on each side))	Total width	23 m	Type	PC box girder bridge		Specification item	Specification	Total length	Bai Chay side	3,292 m (including 5 bridges))	Hongai side	4,594 m (including 3 bridges)	Lane		4 lanes (2 lanes on each side) But there are 2 lanes for the access roads (1 lane on each side)	Width		29 m (but access road is 9m)	<p>constructed in accordance with the same specifications and type as in the original plan.</p> <p>(2) Project period July 2001 – December 2006 (65 months) (completed) The delay was not caused by the project (the main bridge section). Rather it was in the approach road section, which is not targeted in the present medium review.</p> <p>(1) Objective of the introduction</p>
		Specification item	Specification																																				
Main bridge	Total length	903 m																																					
	Number of lanes	4 lanes (2 lanes on each side)																																					
	Total width	25.3 m																																					
	Navigation ceiling	50 m																																					
	Type	PC cable stayed bridge																																					
Approach bridge	Total length	99 m																																					
	Number of lanes	4 lanes (2 lanes on each side))																																					
	Total width	23 m																																					
	Type	PC box girder bridge																																					
	Specification item	Specification																																					
Total length	Bai Chay side	3,292 m (including 5 bridges))																																					
	Hongai side	4,594 m (including 3 bridges)																																					
Lane		4 lanes (2 lanes on each side) But there are 2 lanes for the access roads (1 lane on each side)																																					
Width		29 m (but access road is 9m)																																					

<p>Loan Satisfaction Survey]</p>	<p>under the present project is as follows:</p> <p>The Vietnamese economy was hit hard by the Asian economic crisis. While it maintained a growth rate of 8–9% over the several years prior to the crisis, the high pace of growth began showing signs of slowing down, with the growth rate dipping to 4.8% in 1999. While the Vietnamese economy is seen to have strong potential, its economic foundation continues to be fragile in comparison with other ASEAN member countries. Considering, among other things, the urgent need for infrastructure building and the fear that the slowdown in economic growth will strengthen the voice of those critical of the government’s Doi Moi (renovation) policy, thereby forcing the government to rollback on its commitment to make the transition to a market economy, it is essential that the Government of Japan continue its support for Vietnam.</p> <p>(a) Degree of maturation The project has already won the approval of F/S and EIA, and D/D is now in the preparation stage.</p> <p>(b) Provision of a project that has pump priming effect and can attract private investments In addition to solving the traffic bottleneck on the National Highway No. 18, by bringing about safe passage for large-scale ships that use Cai Lang Bay, the project will prove extremely effective for improving both land and sea transport. In particular, the project will contribute significantly to the industrial development of the entire northern region of Vietnam for the following reasons: (i) coal and steel related industries have been flourishing in the areas along the National Highway No. 18 for sometime; (ii) cement, steel, flour milling and other factories are being built; and (iii) in addition to remaining the Vietnam’s production center of rice, the region has a tourism development plan centering on Ha Long Bay.</p>	<p>The reasons the Ministry of Finance gives for adopting the project include low interest rates, long payment period, and sophisticated technology. By contrast, the executing agency has cited as reasons high quality, prompt project implementation, and advanced technology.</p> <p>(2) Competition and procurement Five companies participated in P/Q; all passed. Four of the five took part in the bidding. Regarding comments made concerning the qualifications required for subcontracting and countries eligible for procurement, the executing agency said: “The regulations regarding the Special Yen Loan made it difficult to implement the project. Specifically, due to regulations regarding primary subcontractors, we were unable to hire highly capable companies from a third country to serve as our primary subcontractors. Consequently, we had to settle for less competent Vietnamese companies. Due to regulations regarding countries eligible for procurement, we were unable to procure necessary equipment, materials and services because we could not get a wide range of countries participate in the bidding. As a result, we were denied an opportunity to reduce cost.” One of the consultants commented thus: “The definition of “domestic procurement” is ambiguous, and although each piece of equipment and material to be procured has to be examined and its suitability adjudicated, there were many instances where it was difficult to judge the quality and suitability of each item to be procured, and so we had to ask JBIC to adjudicate. It is desirable that appropriate rules and regulations for operating the procurement system be established so we can make certain all persons concerned are fully aware of these rules and regulations.” One of the contractors explained the difficulties he had by citing a concrete example: “At present, contractors make procurements globally, so that even in the case of articles to be procured, there are large numbers of articles that are produced through a process of division of labor</p>
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	<p>(c) Reflection of Japan's knowhow and technological prowess as well procurement from Japan</p> <p>The project involves the building of a one-sided suspension PC cable stayed bridge, the executing of which requires highly sophisticated technology. As such, the project allows Japan to fully capitalize on its proven know-how and technical expertise in the field of bridge building. Also, the entire procurement from Japan of the equipment, materials and services required for the construction of the main bridge is expected to cost more than 50 percent of the total Japanese ODA Loan that will be provided by the project. Consequently, there is plenty of room for private Japanese companies to contribute to this project.</p>	<p>involving a multitude of companies. As a result, it is difficult to identify their countries of origin.”</p> <p>(3) Competence of primary subcontractors</p> <p>Under the Special Yen Loan system, primary sub-contracts are bilateral and untied. Five companies were selected as primary subcontractors to handle the building structures. Vietnamese companies were assigned to build the parts other than the foundation section of the bridge. The primary subcontractors were selected from among Vietnam's leading companies. However, the executing agency, the contractors and the consultants all indicated in their comments that Vietnamese workers were so weak in practical skills that a lot of effort and time had to be spent guiding and supervising them. Consequently, the contractors had to mobilize a lot of Japanese technical experts to manage them at the site (at peak time, about 15, which is equivalent to 1/4 of the staff working in the work office). Comments from both the contractors and the consultants confirm the fact that, by and large, primary subcontractors in Vietnam are cash-strapped, which made it hard to mobilize enough workers for the project.</p> <p>(4) Project cost</p> <ul style="list-style-type: none"> · By adopting a one-sided stay in suspension, the project succeeded in minimizing the foundation work, the infusion of equipment and materials, and the work load. The cost was kept lower than in building a two-sided stay in suspension bridges like the Bing Bridge and the Can Tho Bridge. Since a one-sided stay in suspension bridge demands a higher level of expertise than does a two-sided stay in suspension bridge, it can be concluded that the content of the project was suitable for the Special Yen Loan. · According to the executing agency, the contractors' contract price was well within the budget, as the government approved 93% of the budget.
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<p>Lessons learned and Recommendations</p>	<p>[Lessons learned]</p> <ul style="list-style-type: none"> • The construction work done under the project was completed as scheduled. The fact that land acquisition by the provincial government went smoothly is the biggest reason why the project was completed on schedule. The success of this project confirms the importance of implementing – before the project was executed – a land acquisition plan designed to prevent anything from hindering the construction process. • As an employment strategy for employees of the ferry service, the ferry service company was reorganized into a bridge operation and maintenance company, which then reassigned 60 percent of the workers to take part in the operation and maintenance of this project. This proved effective as an employment strategy, and thus set a positive precedence for similar projects. 	

	<ul style="list-style-type: none"> By adopting the one-sided stay in suspension as its construction method, which requires a high level of technical expertise, the foundation work and the infusion of materials and equipment were both reduced, thus making it possible to implement the project at a cost less than what it would have cost had a two-sided stay in suspension method been used. The project is therefore a good example of an appropriate selection of construction method, and as such, worth referencing. <p>[Recommendations]</p> <ul style="list-style-type: none"> Slope protection work for the approach and access roads was delayed, so there is concern that there will be sediment discharge during the rainy season, etc. It is recommended that the slope protection work be completed as quickly as possible and necessary steps be taken to protect against sediment discharge. The Loang Thong intersection at the end of the approach road on the Hongai side is located at the end of the downward slope of the approach road. It has been pointed out that the downward slope may cause traffic accidents. It is hoped that appropriate measures will be taken to prevent accidents including properly managing the traffic signals, paving the approach road, etc. The implementation of the National Highway No. 18 Project is today stalled in Cua Ong, which is located 38 kilometers east of Hongai. Development of the regional economy requires construction of a road extending east from Cua Ong to Mong Cai (at the Chinese border). By constructing a road extending east from Cua Ong, the effectiveness of the Bai Chay Bridge will be enhanced that much more. As a concrete measure to heighten the objectives of the project, the improvement and maintenance of that part of National Highway No. 18 extending eastward from Cua Ong should be promoted. In monitoring and evaluating the effects of the project, of the contents agreed upon as operation indicators and effect indicators, considering the objective of the project and the actual condition at the site, the contents of the said effect indicators should be thoroughly reviewed as shown in the next item.
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<p>Indicators set for use at the time of ex-post evaluation</p>	<p>In the ex-ante evaluation, it is agreed that the following operation indicators and effectiveness indicators be monitored.</p> <table border="1" data-bbox="436 949 1243 1396"> <thead> <tr> <th></th> <th>Indicator</th> <th>Unit</th> <th>Application</th> </tr> </thead> <tbody> <tr> <td>Operation indicator</td> <td>Average annual traffic volume</td> <td>Veh./day</td> <td>Traffic volume at certain places and times</td> </tr> <tr> <td rowspan="3">Effect indicator</td> <td>Reduction of traveling cost</td> <td>¥1000/year</td> <td>Reduction of traveling cost realized by the project</td> </tr> <tr> <td>Traveling time saving</td> <td>¥1000/year</td> <td>Traveling time saving realized by the project</td> </tr> <tr> <td>Reduction of traffic accidents</td> <td>¥1000/year</td> <td>Reduction of traffic accidents realized by the project</td> </tr> <tr> <td></td> <td>Cost-benefit ratio based on AASHO standards</td> <td>%</td> <td>Cost-benefit ratio</td> </tr> </tbody> </table>		Indicator	Unit	Application	Operation indicator	Average annual traffic volume	Veh./day	Traffic volume at certain places and times	Effect indicator	Reduction of traveling cost	¥1000/year	Reduction of traveling cost realized by the project	Traveling time saving	¥1000/year	Traveling time saving realized by the project	Reduction of traffic accidents	¥1000/year	Reduction of traffic accidents realized by the project		Cost-benefit ratio based on AASHO standards	%	Cost-benefit ratio	<p>(1) Monitoring situation</p> <p>Monitoring of the indicators is to be implemented by the Quang Ninh Bridge and Ferry Management Company – which carries out the operation and maintenance of the project – under the direction of the Vietnam Road Administration. At present, the former follows the directions of the Vietnam Road Administration, and every month measures the traffic volume. The measurement results of the operation indicators (the traffic volume) are reported to the Road Administration every month. However, with regard to the indicators cited in the “effect indicators,” the Road Administration has not issued any clear directions. Consequently, in the mid-term review, there were indicators that were not measured or deemed too difficult to measure.</p>
	Indicator	Unit	Application																					
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Improvement of comfort of passersby	¥1000/ year	Improvement of driver and passenger comfort realized by the project						
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	<p>Source: JBIC domestic record</p>							