STUDY ON PRIVATE-INITIATIVE INFRASTRUCTURE PROJECTS IN DEVELOPMENT COUNTRIES IN FY2012

STUDY ON THE DEVELOPMENT OF BACH DANG BRIDGE ON HALONG-HAIPHONG HIGHWAY IN THE SOCIALIST REPUBLIC OF VIETNAM

FINAL REPORT

【SUMMARY】

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Prepared for:

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(1) Project Background and Necessity

1) Project Background

Quang Ninh Province, located in the economic triangle of Northern Vietnam (Ha Noi - Hai Phong - Quang Ninh), has been seeing tremendous social and economic growth. The greatest concern of the province at the moment is, however, the transportation infrastructure, which cannot keep up with rapid economic development, and thus it hinders the province to have sound economic ties with neighboring major cities.

There is a call for active promotion of development of transportation infrastructure not just in Quang Ninh Province but in the entire country, but now that the shortage of funds for infrastructure development has become obvious and that the public debt to GDP ratio exceeds 50%, the country has in recent years relied on BOT, BT for roadside development and other PPP models: for example, the number of project achievement has become 100 or more. The Ha Noi-Hai Phong Highway Project which commenced ahead of this Project adopts a financial scheme where VIDIFI established with the capital of VDB and other parties acts as the project implementing body, and Japanese financial institutions give loans to VDB: there are great expectations for Japan to continue to invest in Vietnam.

SE Corporation found this Project when it independently conducted in October 2011 a project finding survey on PPP road projects in Vietnam. On April 9, 2012, SE Corporation, as a major investment company in future, signed memorandums of understanding with QNPPC, and discussed and proposed various matters for "Bach Dang Bridge and Approach Road" (hereinafter referred to as "the Project") which is a road of some 5 km on the Hai Phong side of Ha Long-Hai Phong Highway (total length: approximately 25 km).

2) Project Necessity

The current major road network from Quang Ninh Province to the city of Hai Phong and the coastal area of Northern Vietnam chiefly consists of National Routes 18, 5, and 10. It is said that, as demand increases for transportation increases due to social and economic growth, the road network will reach the limit to provide smooth traffic environments by 2015.

"Ha Long-Hai Phong Highway" is a toll road of approx. 25 km in length connecting the economic triangle of Northern Vietnam. If Ha Noi-Hai Phong Highway is connected to Ha Long-Hai Phong Highway, it becomes possible to travel between Ha Noi and Ha Long, the central part of Quang Ninh Province, in some 90 minutes, and produce various social and economic effects for not just the area concerned but the entire country. Thus, Quang Ninh Province puts Ha Noi-Hai Phong Highway on the top of the priority list of infrastructure development, and the Government of Vietnam also pays attention to the Project.

The target of this Project is approximately 5 km of the length of Ha Long-Hai Phong Highway, approximately 25 km. However, the Project scale of the bridge construction accounts for more than 50% of the entire project because it is the largest bridge in the highway, which is built across the point at a width of about 800 m of the Bach Dang River where large vessels navigate.

(2) Basic Policy concerning Determination of Contents of the Project

1) Background and Implementation Policies of the Country and Quang Ninh Province

Highway construction projects in Vietnam are normally under control of the government, however, the implementation of the Ha Long-Hai Phong Highway Project was commissioned to Quang Ninh Province. Thus, the province commissioned out an F/S and EIA on its own budget to TEDI, which implemented the commissioned tasks, and was permitted to implement this Project by QNPPC in accordance with No.166/QD-UBND on January 19, 2012. In accordance with document No.1621/TTg-KTN issued on October 9, 2012, by the prime minister, the province was approved the separation of Ha Long-Hai Phong Highway to the target section of approx. 5 km in the Project and the remaining section of approx. 20 km.

2) Project Scheme

For implementing the Project with the generation of a minimum amount of public debts, it has been decided by the Government of Vietnam and Quang Ninh Province that the target section (approx. 5 km) is to be constructed in the financially independent BOT scheme in accordance with the government Decree 108/2009/ND-CP (BOT law) that was issued on November 27, 2009, and the remaining 20-kilometer-section is to be implemented in the BT scheme. To summarize it, the SPC procures fund and conducts project design and construction on its own responsibility and owns, operates and maintains the road and road facilities and then transfers the ownership to the provincial government upon the completion of the Project term.

The Project term is stipulated to be 30 years by applying the BOT law in a flexible matter. The toll from vehicles that use the Ha Long-Hai Phong Highway (25 km in total length) is the source to recover the investment fund for the Project, in principle.

It should be noted that the land development project in the Dam Nha Mac Area, which, at the time of signing the MOU with QNPPC, was part of this Project to help the recovery of its investment costs, has now become an independent and separate project. Subsequently, the principal financial resource for recovering the investment costs of this Project was changed to the remaining 20-km section of the Ha Long-Hai Phong Highway.

3) Planning policy for Bach Dang Bridge

Because the Project is a long-term financially independent project based on the BOT law, it is important to reduce the project cost as much as possible while ensuring convenience, travelling performance and safety as a road. In promoting overseas activities of Japanese companies, it is also necessary to create a system that enables them to participate without difficulties, transfer the bridge technologies and operation and maintenance knowhow and other technologies that were developed in Japan to Vietnam, and guarantee the project continuity.

The Ha Long-Hai Phong Highway is a key road that connects the economic triangle zone in northern Vietnam and it is a road that brings tourists to Ha Long Bay from Ha Noi, Hai Phong and other major cities. Consideration needs to be given to the scenery of the Bach Dang Bridge that will be one of the biggest in the country. Because it is situated in the coastal zone of the Red River Delta, climate, soft ground and other natural environment unique to the region also need to be considered. Based on the conditions above, road and bridge plans are examined.

4) Policy for consideration concerning land development in Dam Nha Mac Area

On the assumption that the Bach Dang Bridge, the development concept of the Dam Nha Mac Area was formulated by confirming the development zones and policies under the existing Master Plan while taking into consideration the local characteristics of the area. In addition, a land utilization plan (draft) was formulated and the approximate cost was estimated.

(3) Overview of the Project

1) Route Plan

There are following possible routes of Ha Long-Hai Phong Highway: inland, central (2 routes) and seaward routes. As a result of examination, the presently planned route selected in the existing F/S is considered to be a reasonable route.

2) Traffic Demand Forecast

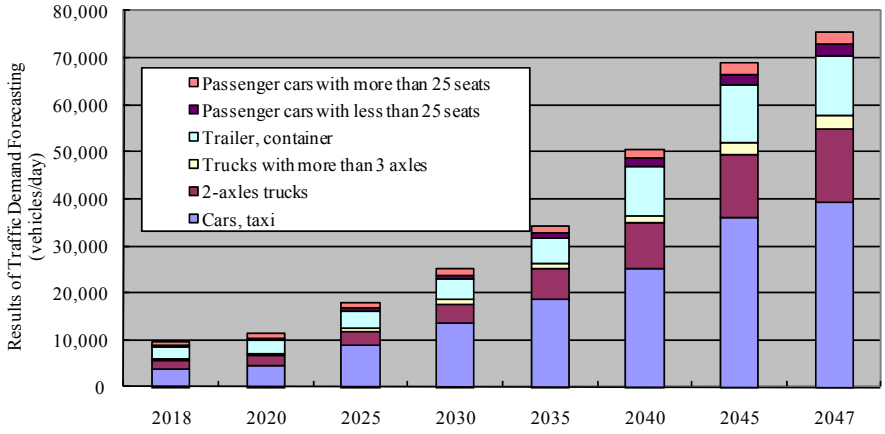
Prior to the traffic demand forecast, traffic volume survey and interview were conducted to understand the current traffic conditions in the target area and use the results as basic data for the forecast. The traffic demand was forecast for a period of 2018 to 2047 based on the current road network and future road development plans to which the government is committed as its policy. Socioeconomic growth factors (population, GDP and auto fleet) that were estimated in advance were used as input data. The toll fare used for the forecast was decided as toll opposition based on the current standard in Vietnam and the fare to be used for the Ha Noi-Hai Phong Highway. The toll fare are shown in Table 1, and Figure 1 shows estimated traffic demand during the project period from 2018 to 2047.

Table 1 Tolls for Ha Long-Hai Phong Highway

Type of vehicle	Price	2015 – 2019	2020 – 2024	2025 – 2029	2030 – 2034	2035 – 2039	2040 – 2044	2045 – 2049	2050
Cars, Taxi	VND	30,000	36,000	43,200	51,840	62,208	74,650	89,580	107,495
2-axis Trucks	VND	45,000	54,000	64,800	77,760	93,312	111,974	134,369	161,243
Trucks with more than 3-axis	VND	66,000	79,200	95,040	114,048	136,858	164,229	197,075	236,490
Remook, Container	VND	240,000	288,000	345,600	414,720	497,664	597,197	716,636	859,963
Passenger cars with less than 25 seats	VND	45,000	54,000	64,800	77,760	93,312	111,974	134,369	161,243
Passenger cars with more than 25 seats	VND	66,000	79,200	95,040	114,048	136,858	164,229	197,075	236,490

(Source: created by the Study Team)

Figure 1 Results of Traffic Demand Forecasting



(Source: created by the Study Team)

3) Road Plan

The road height that is decided based on the relation of the limit of navigation of the Bach Dang River and the bottom edge of the girder is lowered by four meters at the navigation point of the river because the type of the main bridge is changed from PC box girder bridge that was chosen in the existing F/S to the low-girder steel cable-stayed bridge. Accordingly, the interchange connecting with the Ha Noi-Hai Phong Highway that was originally planned to be an elevated bridge structure is also changed to underpass structure. As a measure to cope with future increase in lanes in accordance with the increase in traffic volume, the width of a lane will be changed instead of widening of the road.

4) Bridge plan

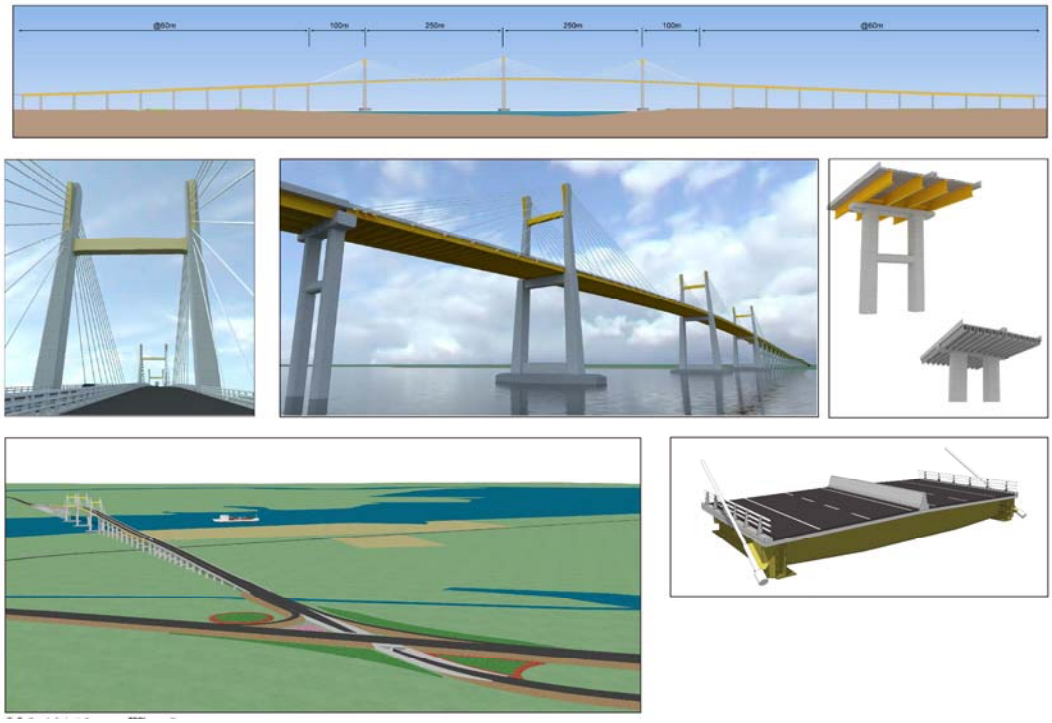
A. Main bridge

The main bridge crosses over the point of the width of about 800 m of the Bach Dang River where large vessels are navigated and there are constraints: limit of navigation determined by navigating vessels and a midair limitation related to the takeoff and landing of aircrafts at the Cat Bi Airport approx. five kilometers away southwest of the bridge. A steel four-span continuous cable stayed bridge is selected as the superstructure in consideration of the limit of navigation, midair limitation, soft soil, shortening of construction period, and participation of Japanese companies. The substructure is decided based on the collision load of vessels that travel the river. Thus, it has the structure with resistance against the collision load (thickness of members and number of piles). At the same time, the length of the main span is revised to 250 m from 220 m, originally planned length, to reduce the collision risk, thereby securing the space for installing the fender between the navigation route and pile cap.

B. Approach bridge

The approach bridge is a bridge consisting of a land section on the Hai Phong side connecting to the Ha Noi-Hai Phong Highway and the land section on the Ha Long side that accesses Dam Nha Mac. The basic bridge structure is a steel-plate girder bridge and the optimal span length is 60 meters based on the consideration of soft ground and reduction of construction processes during the uncertain underground work. However, super T-shaped girder (span length of 40 meters) is chosen for the section where the bridge pier is lower for cost reduction.

Figure 2 Conceptional CG of Bach Dang Bridge



(Source: created by the Study Team)

5) Maintenance plan

Because the Bach Dang Bridge is constructed in a severe environment with salt flying from the ocean and hot and humid climate unique to Vietnam, it needs to be maintained properly to stay in good conditions. The policy of the maintenance plan is to carry out careful inspections to understand the damage and make repair in an early stage of the damage to prevent its progress to a level that require major work for the five-kilometer project section. Long-term anti-corrosion paint (C-5) is chosen based on the possibility that weather-resistant steel does not cause formation of high-quality stable rust due to the flying salt. Based on the above policy, the maintenance cost to be generated in each year during the Project was calculated.

6) Operation plan

The plan is based on the condition that the SPC operates the entire approximately 25-kilometer Ha Long-Hai Phong Highway.

Operation is assumed to be general affairs and planning, toll collection, traffic control, procedures for outsourcing of road maintenance and management of these duties. Using preceding projects as reference, operation cost is estimated to be six percent of annual toll income.

7) List of Target Project Facilities

Table 2 List of Target Project Facilities

Item	Breakdown
Project zone	• Approx. 5 km on Hai Phong side of Ha Long-Hai Phong Highway • Starting point: KM19+800 • Ending pint: KM25+211 However, the operation zone is assumed to be the entire length of approx. 25 km of Ha Long-Hai Phong Highway.
Road standards, etc.	• Road standards: limited highway, grade II

		• Number of lanes: 4 until 2025 and increased to 6 lanes around 2030 • Design speed: 100 km/h (80 km/h after it becomes a 6-lane road)
Interchange on Hi Phong side (Connection with Ha Noi-Hai Phong Highway)		• RCBOX culvert: L=140 m • U-shaped revetment: L=115 m + 125 m=240 m • L-shaped revetment: L=80 m + 60 m=140 m • ON/OFF ramp: 4
Bach Dang Bridge	Main bridge	• Bridge type: Steel 4-span continuous cable-stayed bridge • Span: 100 m+250 m+250 m+100 m • Width: B=25 m • Tower style: concrete H-shaped tower (concrete strength==50MpA) • Tower height: 93.5 m • Diagonal member alignment: 2-phase suspension, fan style • Main girder: steel-concrete composite 2-main I-shaped girder • Girder height: 2.5 m • Floor slab: RC slab (concrete strength=35MpA, slab thickness=25 cm) • Tower foundation: Cast-in-place pile (concrete strength=35Mpa, pile diameter=2.5 m)
	Approach bridge	• Bridge type: Steel continuous composite 2 main I-shaped girder bridge, super T-shaped girder bridge • Span: 12x40 m + 6x60 +6x60 = 1,200 m (Ha Long side) 9x40 m + 6x60 +7x60 = 1,140 m (Hai Phong side) • Width: inbound: 12.25 m, outbound: 12.25 m • Main girder: steel-concrete composite 2-main I-shaped girder • Girder height: 2.9 • Floor slab: RC slab (concrete strength =35MpA, slab thickness=25 cm) • Bridge pier type: RC rigid-frame bridge pier (concrete strength=35MpA) • Abutment: RC structure (concrete strength=30MpA. • Foundation structure: Cast-in-place pile (concrete strength=35Mpa, pile diameter=1.5 m)
Interchange and approach bridge on Ha Long side (Dam Nha Mac)		• KM21+731 – KM19+800 • It is widened near the tollgates (8 gates) for the length of stay
Others		Tollgate, operation office, memorial center

(Source: created by the Study Team)

8) Construction and Project Costs

The construction cost of the Project is estimated to be 5,213 billion VND (20,051.2 mil JPY). When the project cost is calculated by adding the construction cost, land cost, project management cost, consultant fees, miscellaneous expenses, the cost excluding escalation is to be 6,640.7 billion VND (about 25.5 billion yen), and that including escalation to be 7,999.3 billion VND (about 30.8 billion yen).

Table 3 Construction Cost for Bach Dang Bridge and Approach Road

	Work item	Total (Billion VND)	Total (10 million yen)
A	Office, temporary equipment, etc.	109.3	4.203
B	Road (Ha Noi-Hai Phong Highway IC)	478.3	18.397
C	Bach Dang Bridge	3,650.4	140.399
D	Road (including IC at Ha Long side and approach road)	298.2	11.470
E	Others (tollgate, memorial hall, lighting facility, security measures)	203.2	7.815
F	Construction cost (pre-tax)	4,739.4	182.284
G	VAT:10%	473.9	18.228
H	Construction cost (I+G)	5,213.3	200.512

(Source: created by the Study Team)

9) Land Development Plan in Dam Nha Mac

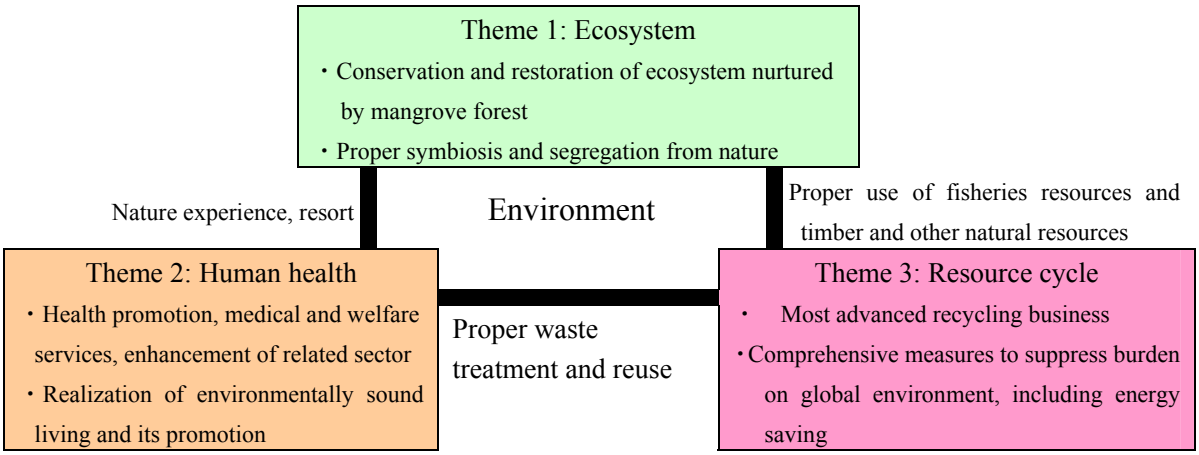
Quang Yen Town M/P divides the town into four areas and describes a development plan. The development policy of Dam

Nha Mac in the town is to develop the central area equipped with urban functions and ports and harbors for heavy industry, while conserving existing mangrove forests as tourism resources.

As the points to consider as predictions, “new spot on international tour route”, “key of distribution network”, “maintenance and conservation of natural environment (mangrove forest)” and others were set. The basic development concept of the project site is determined as “development as a showcase of comprehensive environmental creation that supports sustainable development of Vietnam”.

Viewing the concrete realization of comprehensive environmental creation, focus is placed on the environmental aspects as shown in Figure 3 as themes that make up the basic concept.

Figure 3 Basic Dam Nha Mac Development Concept and Development Theme

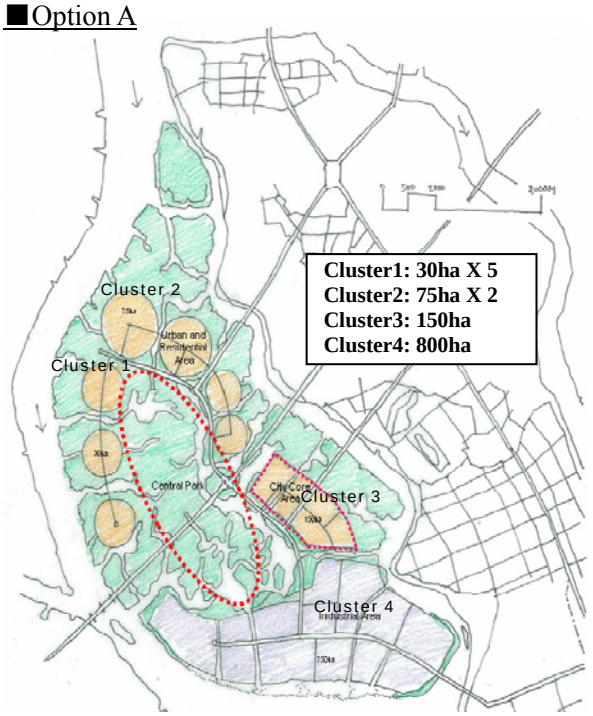


(Source: created by the Study Team)

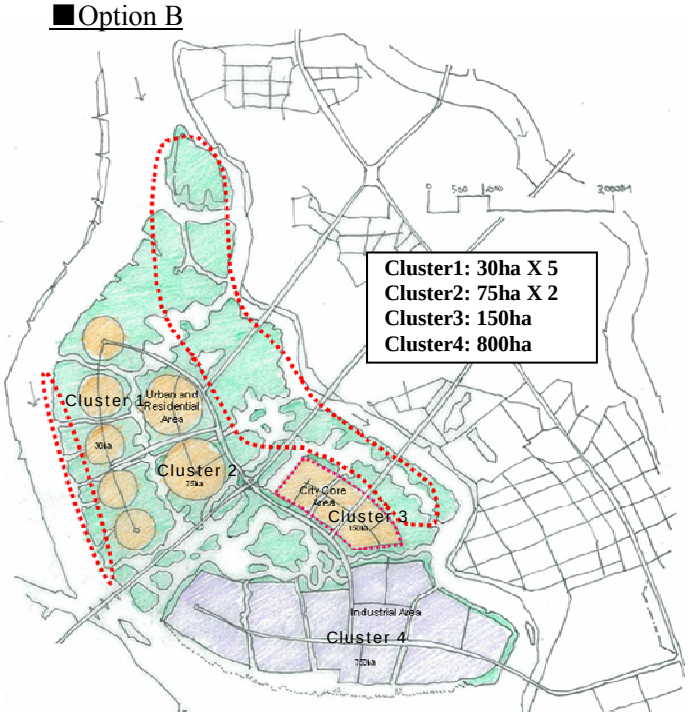
The Dam Nha Mac Area is divided three areas: housing and villa area (300 ha), urban and commercial area (150 ha), and industrial area (800 ha). Two plans were prepared for the land use plan: Option A is to secure large-scaled conservation zone in the center shown in Figure 4, and Option B is to set a coexistence zone of mangrove and development area.

Figure 4 Land Use Plan in Dam Nha Mac

■Option A



■Option B



(Source: created by the Study Team)

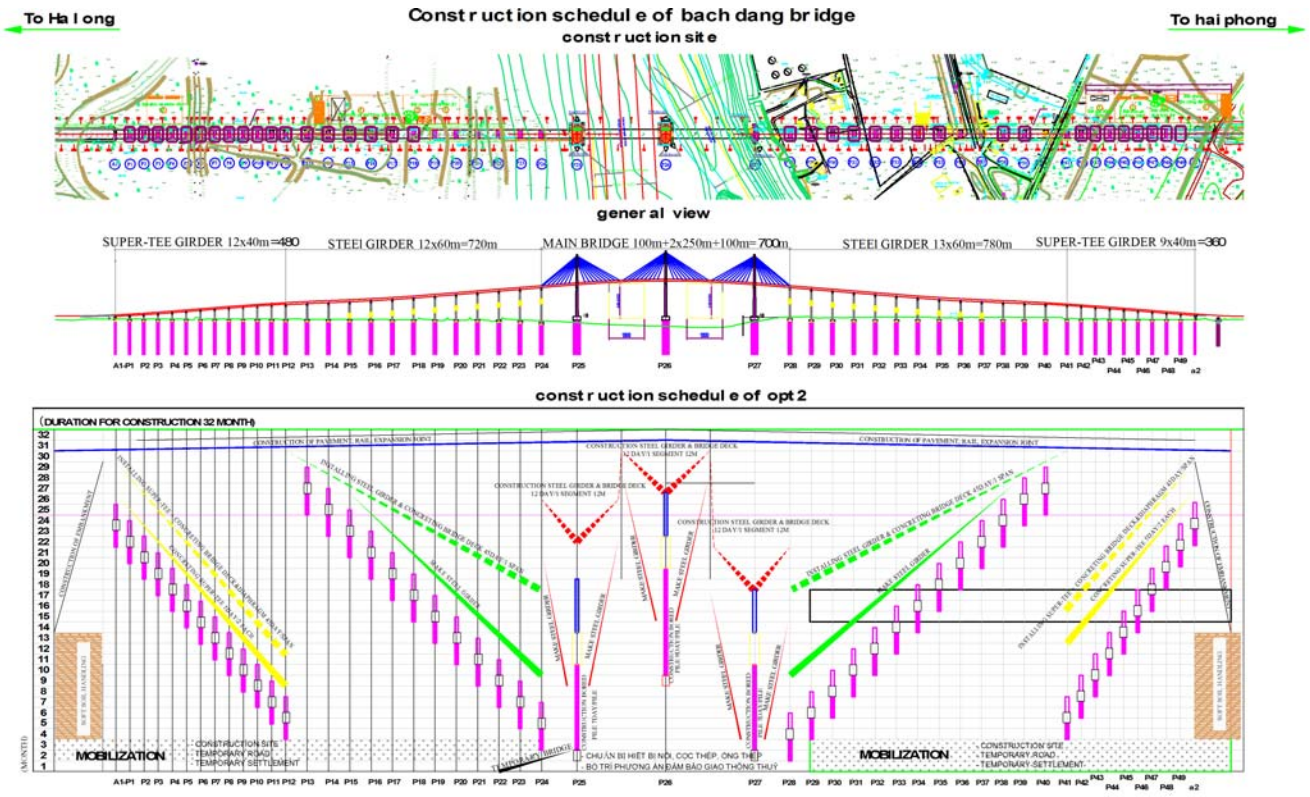
Summing up the concepts of core roads, roads in clusters, park and green space, and supply facilities, and organizing the elements of development plan for clusters 1 to 4 in land use development plan, the current Project cost was estimated at 69, 163 bilion VND (approx. 266 billion yen) for basic infrastructure development and 158,754 billion VND (approx. 610 billion yen) for building.

(4) Schedule of Project Implementation

A. Construction schedule of the Project

The Study Team has assumed that the construction work for the Project will be completed in approximately 32 months on the premise that the number of parties necessary for the work is secured, and the work for the main bridge, approach bridges, interchange both on the Ha Long and Hai Phong sides, and approach road is carried out simultaneously. The construction schedule for the Project is shown in Figure 5.

Figure 5 Construction Schedule for the Project

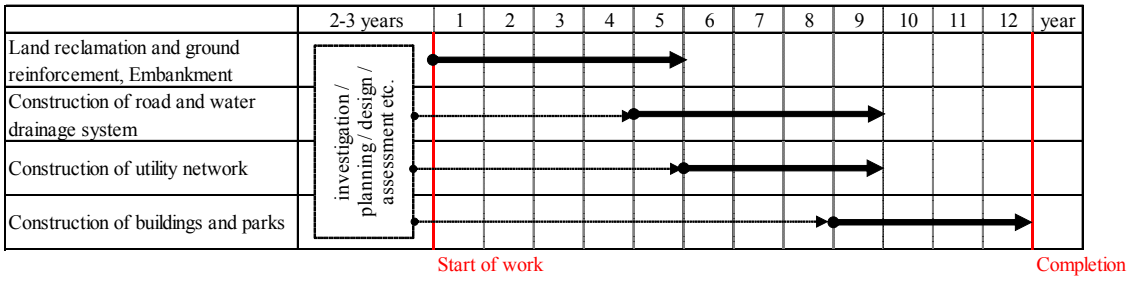


(Source: created by the Study Team)

B. Schedule for the Development of Dam Nha Mac Area

The implementation schedule of the development of the Dam Nha Mac Area is summarized in Figure 6. It will need adjustment upon closely examining the specifics of the development project after the revision of Quang Yen Town's Master Plan and the appointment of the executor of the project The scheduling will need further refinement through discussions with Quang Ninh Province and Quang Yen Town.

Figure 6 Implementation Schedule of Dam Nha Mac Area Development Project



(Source: created by the Study Team)

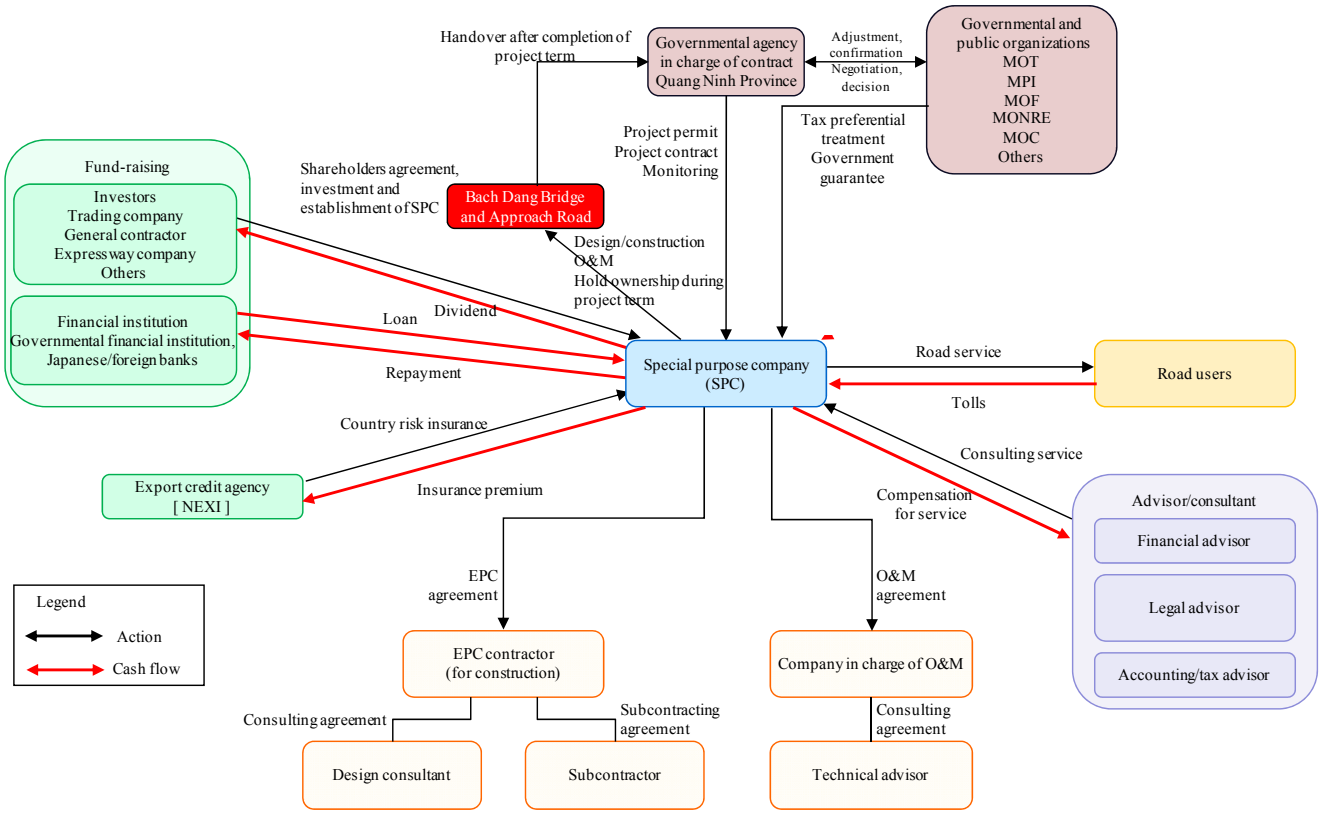
(5) Feasibility concerning the Project Implementation

1) Assumed Project Scheme

The feasibility of the Project were evaluated by calculating its FIRR and EIRR, based on the assumed project scheme in Figure 7. While highway construction projects are originally under the control of the government, the counterparty of SPC

is Quang Ninh Province because the license for the implementation was transferred from the government to the province in the Project.

Figure 7 Assumed Project Scheme



(Source: created by the Study Team)

2) Preconditions for financial and economic analysis of the Project

As preconditions for financial and economic analysis, required capital taken in consideration of increase of commodity price by the Project implementation, pre-operational cost, interest during construction, and operation and maintenance cost during the Project were included in assumed expenses. For income, toll revenue which is calculated by multiplying traffic demand forecast by toll charged by vehicle type was considered. For financing, the required capital would be raised by 70 percent loan and 30 percent equity and that the loan would be repaid at 4 percent interest (a rate applicable to JICA's overseas investment loan) over a 20-year period. As for taxation, corporate tax, VAT, and depreciation expenses were taken in consideration. It should be noted, however, that the overseas investment loan interest rate is a hypothetical one used for the purpose of this Study and not the confirmed or finalized rate.

3) Calculation of FIRR

As a result of calculation of FIRR under the preconditions, FIRR on investment and on project are 11.4% and 9.9, respectively.

4) Sensitivity analysis of FIRR

A. Sensitivity analysis of financing

A sensitivity analysis was conducted on several different scenarios with varying equity ratio, loan interest rate, and repayment period. A two-step loan was assumed, in which funds loaned by a Japanese bank to the Vietnamese government

bank are loaned to SPC at 15 percent interest. As the result of the analysis, it was revealed that FIRR on investment would improve up to 12.6% if low-interest loans of Japanese financial organizations are realized and equity ratio becomes small.

B. Sensitivity analysis of capital requirement and toll revenue

The sensitivity of the investment FIRR was analyzed to varying capital requirement and toll revenue by changing the required capital to 0.8 to 1.2 times that of the base case, and the annual increase rate of tolls to 8 - 12 percent of the base case. According to the result, 10 percent increase/decrease in capital requirement results in about 0.4 percent increase/decrease in FIRR on investment, and 1 percent increase/decrease in the annual increase rate of tolls results in about 1.2 percent increase/decrease in FIRR on investment. This indicates that FIRR on investment is more sensitive to the variations of annual increase rate of toll revenue.

5) Calculation result of EIRR

A. Calculation of the benefit of time saved

The benefits of time saved and reduction of traffic accidents and secondary effects of reduced time are expected as economic effects, however, the benefit of time saved was considered for EIRR calculation.

At present, Hai Phong City and Ha Long City are connected by National Routes 10 and 18. It is estimated that, after the completion of the Ha Long-Hai Phong Highway, the travel distance between the two cities will be shortened by 45 km, reducing the travel time by 120 minutes at an average car speed of 45 km/h. Basic data of estimating the benefit of reduced travel time was set based on the available data from GDP per capita, average annual work hours, average number of passengers and so forth.

As a result, the total economic benefit from reduced travel time is estimated to be 598,486 million yen.

B. Calculation result of EIRR

The EIRR is estimated at 13.3 percent as a result of calculation of EIRR based on the benefit of time saved.

6) Consideration of the results

Calculation of FIRR and EIRR resulted in that making an investment decision is difficult because FIRR is lower than the current long-term (5 years, 10 – 12 percent) interest rate in Vietnam. It is also concerned about uncertainty of toll revenue forecast and cash shortage in the first half of the Project period.

7) Result of cash flow analysis and consideration

As a measure to secure the fund, the VGF scale necessary to ensure DSCR>=1.3 was clarified in cash flow analysis. As a result, long-term loans can be repaid if a total of approx. 6,251 million JPY (1,624 billion VND) is secured as VGF for the first eight years from the project launch. Similarly, because investment-based FIRR in Chapter 5 will improve from 11.4 percent to 13.2 percent and the figure above the long-term interest will be secured if the VGF is secured, it may meet the minimum level of investment judgment standard.

Action to secure the security package including minimum income guarantee and acquire VGF as government assistance needs to be taken to realize the Project.

(6) Technical Advantages of Japanese Company

1) Expected participation of Japanese companies (business management and administration, equipment supply, investment and so on)

It is desirable to have the participation of Japanese companies that have accumulated the relevant know-how such as the engineering capabilities to build and maintain steel and other large-scale bridges, O&M techniques, and management techniques in Japan as it transitioned from the "era of construction" to the "era of O&M."

Table 4 lists possible forms of participation by Japanese corporations.

Table 4 Possible Forms of Participation by Japanese Companies

Phase	Participating companies	Form of participation	Remarks
Establishment of SPC	Financial institution	Investment in or loans to SPC	Direct finance or 2-step loan
	Trading company, investment company	Investment in SPC	
	General contractor, steel manufacturer	Investment in SPC	
	Highway operator	Investment in SPC	
EPC	General contractor, steel manufacturer	Receive orders for EPC from SPC.	- Vietnamese subsidiaries - Construction and manufacturing will be done jointly with Vietnamese companies.
	Consultant	Receive orders for D/D from primary contractor of EPC. Receive orders for S/V from SPC.	Joint work with Vietnamese consultant
O&M	Highway operator	Receive orders for O&M from SPC.	Employ local staff as much as possible.

(Source: created by the Study Team)

2) Advantages of Japanese companies in implementing the project (from technical, economic view)

Five techniques were described as technical superiority of Japanese companies: "design techniques of cable-stayed bridges", "superstructure erection techniques under difficult erection conditions", "production techniques of high-quality steel plates and steel bridge components", "supply and installation of high-quality stay cables", and "techniques related to O&M".

As for economic superiority, the following matters are mentioned such as utilization of local staff, the Vietnamese government's policies for attracting of foreign investment and friendly relation with Japan, and possibility of relocation of the offices of Japanese countries to Vietnam in connection with "China Risk".

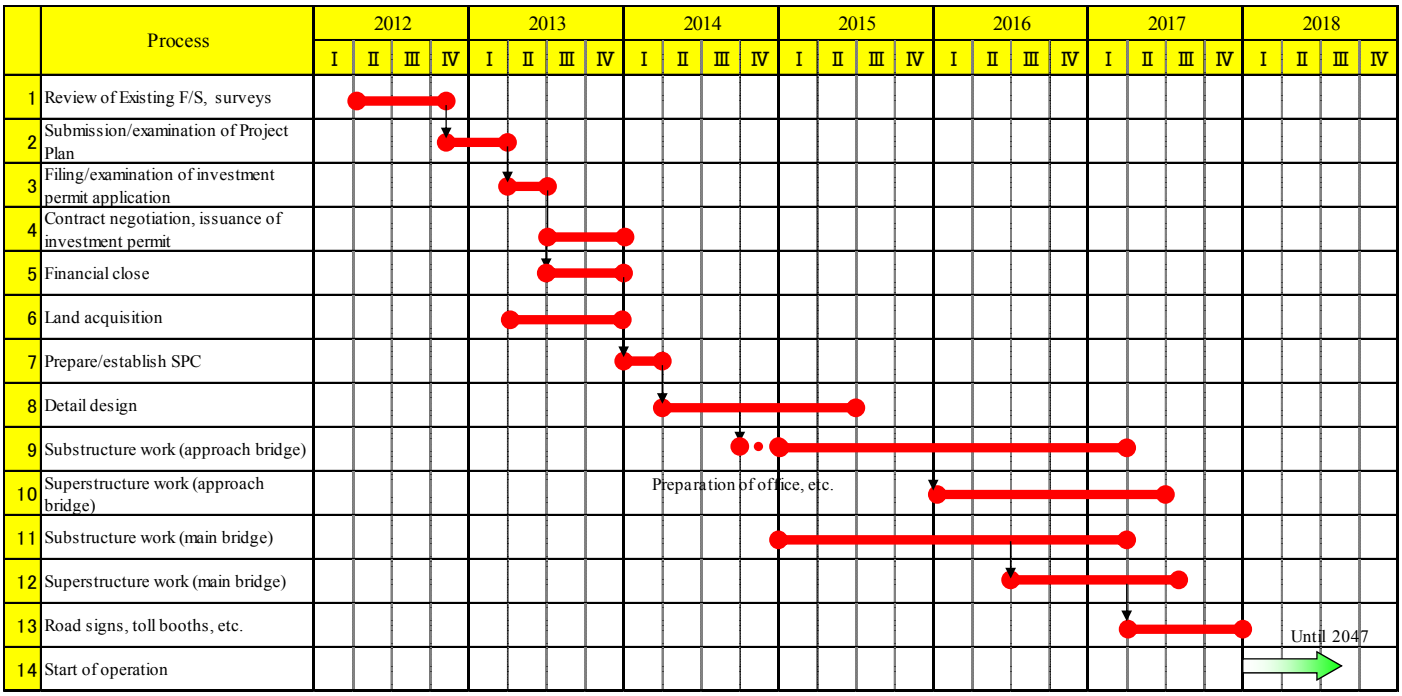
(7) Concrete Schedule and Risks for Project Implementation

1) Concrete schedule for Project implementation

Construction and operations in the Project must follow the procedures under the Vietnamese BOT law, which Quang Ninh Province plans to simplify and expedite as much as possible in a flexible manner. It is likely that at least six months would be needed to close all financial transactions, including investment and loan procedures. Construction in the Project will take 32 months after the commencement of the work.

The year of start of operation was set to be 2018.

Figure 8 Implementation Schedule of the Project



(Source: created by the Study Team)

2) Risks for Project implementation

Risks for implementing the Project are as follows: risks of foreign exchange, price fluctuations, force majeure, related to land acquisition, delay in commencement of the operation, and demand fluctuations, and sharing of the risks are described.

A. Risk of foreign exchange and price fluctuations

In general, the term of a PPP project from the date when the contract is concluded to the date when construction is completed is long, and thus an abrupt change in foreign exchange rates and prices causes a greater burden on the private business operator concerned. For the foreign exchange rate and the rate of CIP increase, the degree of political intervention is much greater in Vietnam than in Japan. Thus, both the public and private sectors should set out index exchange and inflation rates in advance in the project contract, and also set out a buffering scope of risk that the private business operator manages to assume. At the same time, they should desirably revise the risk-sharing under certain conditions upon mutual consultation.

B. Force majeure risk

It is the case where earthquakes, floods, typhoon and other natural disasters; terrorism of third parties and other human-caused disasters; and other events that are normally unforeseeable and attributable to neither public nor private sector cause problems with Project implementation. It is desirable that the public sector bear the cost because the private sector basically cannot control the risk.

C. Risk related to land acquisition

It should be noted that some road construction projects in Vietnam fall behind schedule because of difficult land acquisition. In addition, there is a possibility that unexploded bombs are discovered around the project site, which was a battle field at the time of the Vietnam War. Construction of Ha Long-Hai Phong Highway is expected to require resettlement of

approximately 200 or more households and transfer of high-voltage wire near the interchange on the Hai Phong side. However, Quang Ninh Province acknowledged that it would assume all the relevant responsibility in negotiations made so far, so that the public sector assumes the risk.

D. Risk of delay in commencement of the operation

Ha Long-Hai Phong Highway is divided into two project sections and becomes a toll road to be connected to Ha Noi-Hai Phong Highway currently under construction. The commencement heavily depends on the progress of construction. The remaining 20 km section includes 8 bridges, of which 2 bridges are more than 1 km in length, so the construction may be tangled. On the other hand, the Ha Noi-Hai Phong Highway Project which aims to complete construction in 2014 falls behind schedule and has not even started construction work at the moment because of delay in land acquisition to widen the road (increase in lanes from 6 to 12), EX-1, which is the starting point in the city of Ha Noi. The timing of the completion is likely to delay.

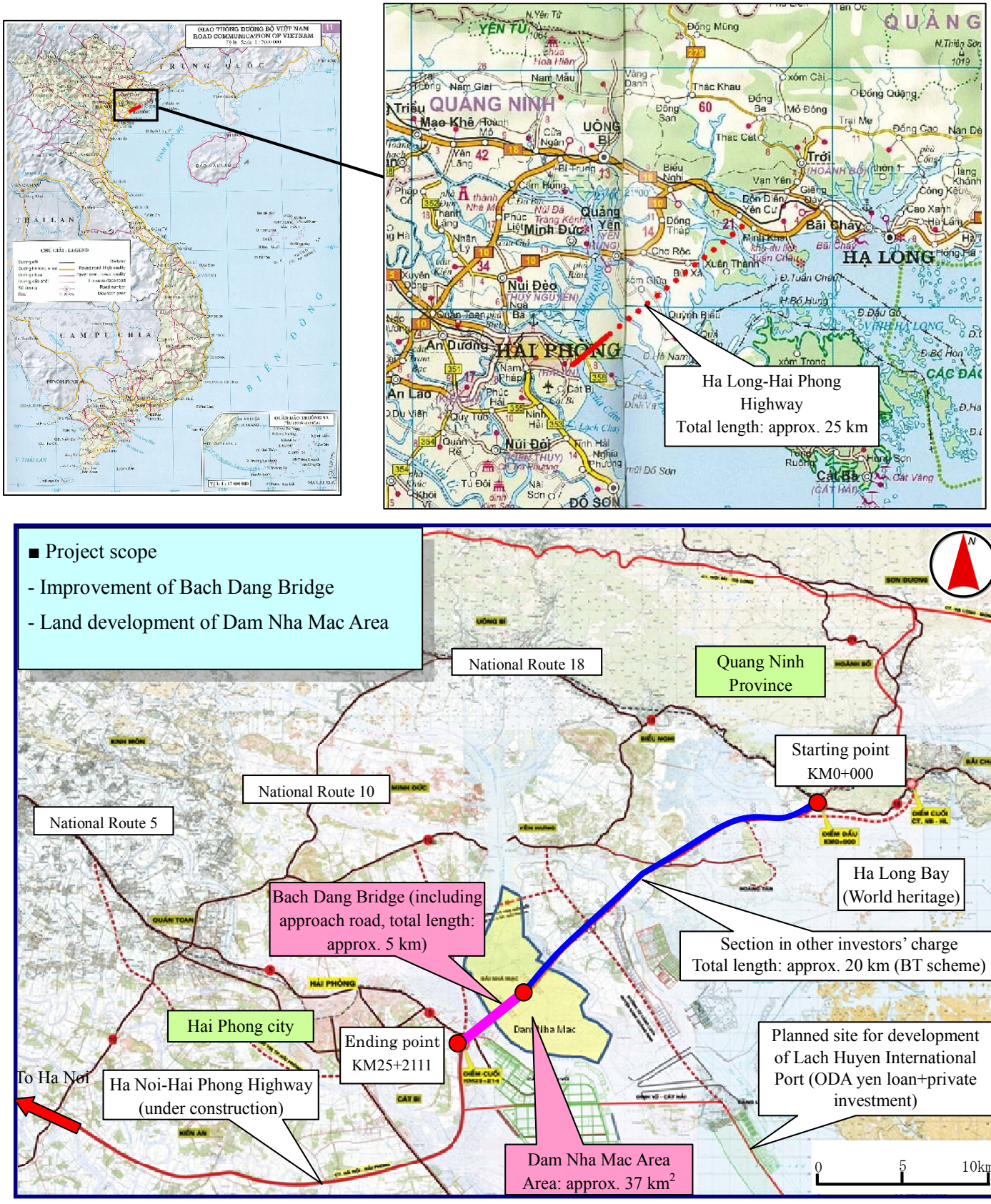
The parties concerned must set out basically in advance the risk-sharing in accordance with factors causing such delay.

E. Risk of demand fluctuations

Possible factors of a decrease in demand for the public services compared to the initial expectation is a change in the social and economic conditions and development of any competing road or other public transportation means in the project area.
This is a project to construct a new road and has no track records, so the certainty of forecasts of traffic demand is lower than that of existing roads. In addition, unlike Japan where the social and economic conditions are relatively stable, Vietnam is a country where the society and economy is developing towards maturity: it is extremely important to accurately forecast the social and economic states of affairs and traffic demand based on the states for the sake of securing the success of the project. If forecasts of traffic demand are not accurate enough at the stage of project planning, they are likely to turn out to be much different from actual traffic volume (performance) after commencement of the services. This will also lead to failure to gain profits that have been expected to be made during the project period. Another risk of an decrease in the number of users arises when a new road is built near the project site although the road is not stated in the master plan for road development or was not planned at the time this Project was initially planned, or other public transportation means that compete with this road project is developed.

Since the private business operator cannot control this type of risks, the public sector assumes additional costs incurred as a result of the said risk by VGF or a minimum income compensation system.

(8) Project Location Map in Vietnam



(Source: created by the Study Team based on the materials of the briefing for investors by Quang Ninh Province)