

**Process Analysis on
“Effectiveness/Project Formulation on Airport
and Port Projects in Vietnam”**

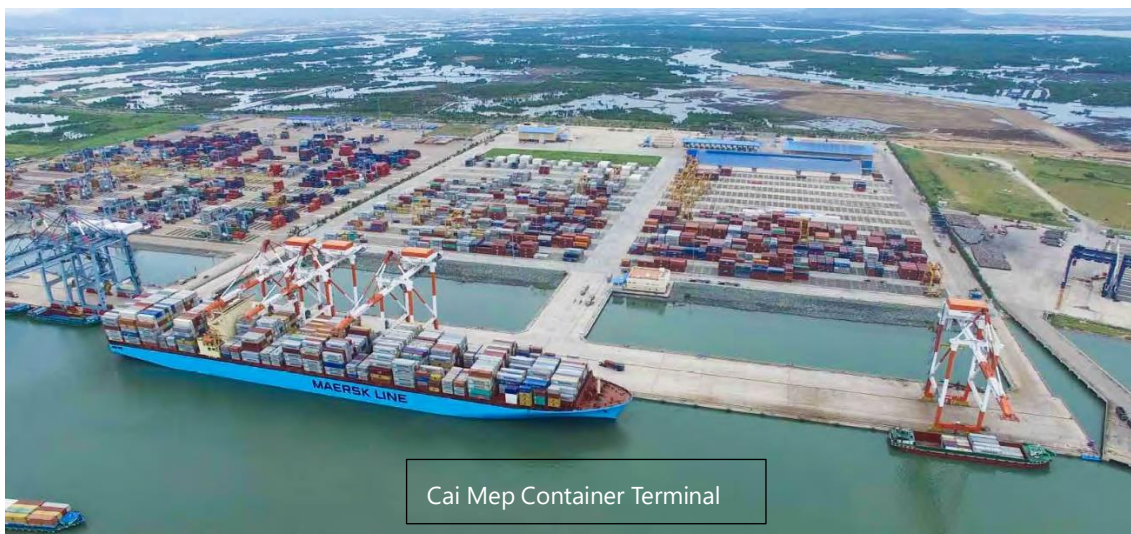
February 2022

JAPAN INTERNATIONAL COOPERATION AGENCY

Almec Corporation

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Process Analysis of Effectiveness on “the Cai Mep Thi Vai International Port Construction Project” in Vietnam

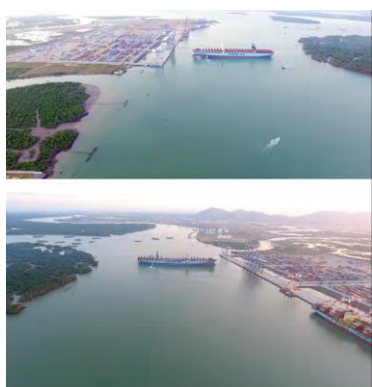


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Cai Mep Thi Vai Navigation Channel

Purpose of the Process Analysis

JICA conducts ex-post evaluations and publishes their results in order to ensure accountability to the public and extract lessons and improvements for similar projects in the future. However, the current ex-post evaluations focus on confirming the effectiveness (outcomes) of the project based on indicators. The process that directed (or did not) to the development of the project's effects is not always confirmed in detail, and the analysis of success and failure factors is not always sufficient. In light of this, we focused on the process as well as on the outcomes of the projects. In order to analyse and strengthen the process from this perspective, we have selected projects where useful lessons can be learned, and we have also conducted evaluations focusing on the "confirmation and analysis of the process of achieving effects." The purpose of this process analysis is to analyse and evaluate, from an ex-post point of view, how the effects were manifested, focusing on the implementation process at the time¹.

This process analysis provides useful lessons learned about the "Cai Mep Thi Vai International Port Construction Project t (I) (II)" (hereinafter "the Project") that can be used for the results of similar port development projects in the future, and makes recommendations for strengthening international competitiveness in the future. When the ex-post evaluation of the project was conducted in FY2018, a good evaluation result was obtained, with an improvement in the utilization rate, which had been a concern at the beginning. Therefore, it was decided to verify the process that overcame the initial problem and how the operation rate was improved. . In addition, this focus on the importance and versatility of the lessons learned as a result of this process analysis.

The impact of COVID-19 infections on the Study

The study was originally planned to start in 2020, but the COVID-19 outbreak limited the number of stakeholders that could be interviewed, which constrained the research. This was due to the following reasons

- The reduction of flights at international airports and the strengthening of waterfront measures. In addition, it is no longer possible to travel from the capital Hanoi to the southern province of Ba Ria-Vung Tau, which is the target area of the project.
- The fieldwork was postponed until May 2021, with last-minute changes to the quarantine protocol and the Vietnamese side refusing to allow interviews for being busy dealing with the pandemic
- Particularly, the working system of the staff in the Ministry of Transport (MOT) was affected when a staff member tested positive for the virus.
- The number of people to interview was limited since it had already been more than 10 years after the start of service, and many of those involved have already retired.

Due to these circumstances, it was decided to conduct on-line interviews with the former MOT leaders.

¹As the results of this analysis are expected to provide useful insights for development practitioners working to solve similar development challenges, we have used the analytical framework of the Global Delivery Initiative (GDI), a platform for knowledge from the international development community, including international organisations.

While information presented in the report is based on a combination of project documents and these interviews, these findings do not represent the official views of the Government of Vietnam or JICA.

Introduction

The Southern Economic Focal Area (SFEA),² which includes Binh Duong, Dong Nai, and Ba Ria-Vung Tau provinces that surrounds Ho Chi Minh City (hereafter “HCMC”) in Southern Vietnam, is the driving force of the Vietnamese economy. In the early 2000s, the SFEA accounted for 11% of the national population, 31% of the GDP, 58% of foreign trade, and 85% of foreign direct investment (FDI). The port terminals in HCMC play an important role in supporting logistics base.

Vietnam is a maritime nation with a long north–south axis with a coastal line of 3,200 km, but in 2000, the main ports were located upstream of urban estuaries which were built since the 1950s.. As a result, the water depths and land behind the ports required for accommodating large ships were insufficient. There were no seaports that can enable efficient export-import handling, and cargo handling facilities were outdated and dilapidated. Therefore, much of the import and export were dependent on secondary transport from Hong Kong and Fangchenggan in China in the north and Singapore in the south.

Throughputs of cargo in southern Vietnam grew at an average annual rate of 8% to 9%, with 17.5 million t of general cargo (excluding liquid cargoes such as oil) handled per annum in 2000, approaching the port cargo handling capacity of the four major terminals in central HCMC (Saigon, Ben Nghe, Tan Can and VICT) (25.3 million t per annum).³ These terminals can only accommodate vessels of 30,000 t. It was feared, therefore, that the handling capacity of the existing ports would not be able to keep pace with the rapidly increasing volume of cargo being handled at the ports. A deep-water port outside the Saigon area was urgently needed to accommodate larger vessels.

Under these circumstances, the Port Sector Plan (Ministry of Transport [MOT], Vietnam, 1999) with a target year of 2010 elaborated the need for a new deep-water port. The area around the mouth of the Thi Vai River, approximately 75 km from HCMC (along the National Highway), was selected as a candidate.

In 2002, a comprehensive port development plan as well as priority projects for SEFA were proposed under the Port Development Study in the south of Vietnam by JICA. Relocating the port terminals in the centre of HCMC as a precondition, it was proposed to build a navigation channel and a general cargo and container terminal on the Thi Vai River in Ba Ria-Vung Tau Province, which resulted in financing this project by a ODA loan. However, even after the commencement of the project, there were serious concerns about the operational status of the terminals for the following reasons.

Firstly, once the decision of financing the project by the ODA loan was announced, in anticipation of the dredging of the Thi Vai River channel, a few world's leading port terminal operators⁴ paid attention to the Cai Mep Thi Vai (hereafter CMTV) area immediately. Subsequently, they decided to invest in a joint venture (JV) with local partners. The decisions and actions were several years earlier than the operators of the two terminals under the project were determined to operate. The opening of the container terminal

² It was defined to cover HCMC and three provinces in 1998(Decision 44/1998/QĐ-TTg), later in 2007, defined to cover one city and seven provinces including four; Tay Ninh Province, Long An Province, Binh Phuoc Province, Tien Giang Province as well,(Decision 159/2007/QĐ-TTg)

³ https://www.mofa.go.jp/mofaj/gaiko/oda/shiryo/hyouka/2004_jizen/y_vietnam1.html (Confirmed July 2021)

⁴ A terminal is a port facility that serves as a nexus for the maritime and land transportation of containers. A terminal operator is a company that operates a container terminal. Terminal operators provide berthing, on-board cargo handling, cargo handling, storage, counting and weighing services, etc.

under the project took place in 2013 since the selection of consultants and contractors had taken more time than planned. However, as several terminals had already been in operation since 2009, there was competition already for collecting cargos. **(①Increased competition due to the boom in terminal investment in the CMTV region** – Refer to 3.1)

Secondly, in 2007 HCMC decided to build a larger port in the Cat Lai and Hiep Phuoc areas, the outskirts of the city, despite plans to develop the port in the Cai Mep and Thi Vai areas⁵. This was to provide alternative container terminals to the congested city centre port, but within Ho Chi Min City. Though, these alternative inside HCMC would be difficult to accommodate large vessels. As a result, the planned relocation of the port terminals of central part of HCMC to CMTV became slow and not thoroughly materialized. **(②Delayed relocation of port terminals and newly developed ports in HCMC** – Refer to 3.2)

Thirdly, CMTV area turns to be hardly a convenient logistics hub due to the delays in the construction of roads and bridges connecting CMTV with industrial parks in HCMC and surrounding provinces. **(③Improving lagging connectivity** – Refer to 3.3) Fourthly, the total number of industrial estates in the vicinity is much smaller, though industrial estates in the hinterland of CMTV Port are being developed, especially Phu My 3 Special Industrial Park established in 2007. Compared to HCMC and the neighbouring provinces of Dong Nai and Binh Duong, the numbers are limited, which resulted in limited volume of cargos. **(④Increasing cargo demand in Ba Ria Vung Tau province** – Refer to 3.4)

Despite the fact that some of these concerns have not been fully overcome, the overall berth occupancy ratio at the Port of CMTV has been significantly improved in 2020. Already the prospect of a further increase in cargo handling volumes has reached a level that calls for the construction of a new terminal in the CMTV port. This report identifies the process by which the low berth occupancy ratio, which at one time appeared to be fatal, was resolved and the project objectives achieved. In particular, it analyses and examines what efforts by the stakeholders involved were important in resolving the issues.

Chapter 1 describes the process from the conception of the CMTV port to the start of construction. The significance of the support from Japan for the CMTV port where its need for a deep-water port was apparent due to the limited capacity of port terminals of HCMC, the economic centre in the south. Chapter 2 elaborates in what way the challenges during the construction of the project were overcome. In Chapter 3, the changes in the external situation of the project and challenges it faced were illustrated in terms of the aforementioned four aspects. It highlights not only the Vietnam Maritime Administration (VINAMARINE) of MOT, the counterpart of the project, but also those which operates port terminals, such as HCMC, companies affiliated to the Ministry of Defence (MOD), and foreign investors interested in terminal operations, and the if and how they coordinated in the port sector. Chapter 4 describes the efforts of stakeholders to improve the quality of services of the CMTV port, which resulted to further results, namely the rapid occupancy ratio. The process of promoting investment and other activities is also highlighted. Lastly, the lessons learned from the project are summarized in Chapter 5, and the challenges for the future in Chapter 6.

⁵ Ho Chi Minh City Transport Development Plan 2007 Decision 101/QĐ-TTg



Source: Website of Japan Port Consultants and JICA

Cai Mep Container Terminal Berth



Thi Vai General Cargo Terminal Yard

Chapter 1 From the conception of the CMTV port to the start of construction

1.1. Rapid growth in cargo handling volumes along with economic development

Since the late 1990s, the HCMC port cluster has been causing traffic congestion. The handling capacity was limited to the demands of the rapidly developing southern Vietnamese economy. However, there was insufficient land to build the necessary facilities in the hinterland of the port. In 1990, the "Maritime Sector Plan for 2010" by MOT already set a plan to build a deep-water international port terminal near the mouth of the Thi Vai River in Ba Ria-Vung Tau Province, about 75 km from the centre of HCMC. It was also clearly stated that the port functions, except for passenger services, would be gradually transferred from HCMC. However, under the economic situation at that time, the cost required for constructing a new large-scale port, including navigation channels was enormous. Although it was recognised as an urgent issue, no concrete plan for implementation had been drawn up. Furthermore, at that time, the roads needed to access the port were not yet developed. While the need for a large port outside HCMC was apparent, foreign investors who could not invest directly in the navigation dredging channel were left to watch the implementation of the plan.

Meanwhile, industrial parks have been developed in HCMC and the neighbouring provinces of Binh Duong and Dong Nai. Accordingly, foreign direct investment (FDI) has grown rapidly, particularly in the light industry since the late 1990s. Ba Ria Vung Tau province, however, has lagged in the development of industrial parks due to its distance from HCMC, a major consumption centre, at over 60 km. However, as an oil and gas producer, there were hopes for industrial development, particularly in the heavy chemical industry. In 2000, Japan and Vietnam decided to study the development potential of the SEFA as a whole, to define the role of respective ports in the SEFA and carry out feasibility studies (F/S) on priority projects.

1.2. Japan's support to maritime sector

Japan resumed the provision of ODA loans to Vietnam in 1992, and in the same year, started the Hai Phong Port Rehabilitation Project in Northern Vietnam. In 2002, JICA conducted the Port Development Study in the South of Vietnam to analyse the current situation of the existing ports in HCMC and prepare

a master plan. When the CMTV and Ben Tinh Sao Mai areas in the Ba Ria Vung Tau province were compared, the former was found superior in terms of access to HCMC and environmental impact. After F/S, it was officially requested as an ODA loan project from the Government of Vietnam. The project was also recognized as contributing to strengthening port functions and improving the investment environment set out in the "Japan-Vietnam Joint Initiative" formulated in 2003.

The Ministry of Transport (MOT) was assigned by the Government of Vietnam to be the project proponent starting from the stage of Feasibility Study Formulation in accordance with the approved planning by the Government. In August 2004, the detailed design (D/D) study began with technical assistance from JICA, and in 2005, the loan agreement (L/A) for the first phase was signed. PMU 85 was selected as the representative of the investor in views of its experience and capacity in conducting construction works under the ODA loan. PMU85 was also in charge of the Da Nang Port Improvement Project, which was preceded by the ODA loan.

However, Vietnam does not have a single organisation that manages both the waters and lands where the port is to be located. State-owned enterprises, i.e., Vietnam National Shipping Lines (VINALINES),⁶ Saigon Port (a subsidiary of VINALINES), and Saigon New Port (SNP)⁷ (a subsidiary of the MOD), managed port terminals, while relevant government agencies (central and local governments) managed ports dedicated for gas, cement, and coal resources. Concurrently, there were cases of private companies managing the construction of such ports through the build-transfer (BT)⁸ system. Therefore, the MOT did the project without having land jurisdiction over the proposed port site. It has been suggested by Japanese port authorities that ports should be managed in an integrated manner to avoid double investment and excessive competition. A port management board (PMB) should be established to enable unified management, but to date, this has not been done due to difficulties in coordinating stakeholders.

In order to ensure the efficient operation of the terminal as well as the development of port infrastructure, the participation of the private sector in the development of the cargo terminal was a necessity. For this reason, the Vietnamese side requested JICA to provide technical support for the development of laws and regulations for the participation of the private sector in port operations, and for the preparation of concession plans and bidding documents, in addition to the ODA loan. JICA supported a Project on the Improvement of Port Management System (technical cooperation) for about three years from 2005.

⁶ It is now called Vietnam Maritime Corporation (VIMC). It is formerly a state-owned shipping company under the MOT and became a joint stock company in 2020.

⁷ The SNP was established in 1989 with five deep-water terminals (three in Cai Mep, Lach Huyen in Hai Phong, Cam Ranh in Khanh Hoa Province) and seven feeder barge terminals (Cat Lai, Hiep Phuoc, and Phu Huu in Ho Chi Minh City; Mien Trung in Quy Nhon Province; two in Hai Phong [128 and 189], Cai Quy Port in Can Tho Province [128 and 189], and Cai Cui port in Can Tho province). Its market share in terms of container cargo handling is 63% of Vietnam's total, 65% of CMTV, and 96% of HCMC (as of 2020).

⁸ In the build-operate-transfer (BOT) system, the private sector builds and operates the facility, which is then transferred to the government at the end of the contract period. In the build-own-operate (BOO) scheme, the private sector builds, operates, and owns the building.

There had already been several technical assistances from Japan to support the maritime sector,⁹ and many administrative challenges were well-recognized at the time. Accordingly, it can be said that Japan has been providing infrastructure development (this project) and policy support (technical cooperation) while foreseeing difficulties. The decision of Japan to support port development in the CMTV area was quite challenging but a game changer since this brought an enormous opportunity for terminal investment and transformation. It had been difficult for Vietnamese officials to coordinate such large-scale investment projects involving many stakeholders.¹⁰

Chapter 2 Efforts of all parties involved towards the completion of the project

2.1 Effort to Environmental and social considerations

Vietnam enacted the new Environmental Protection Law in 2005, which establishes regulations on Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), water environment protection, etc., and particularly stipulates the protection of water bodies. In the D/D of the project, which started in 2004, the impact of the port construction was also considered. The project was prepared following the Guidelines for Environmental and Social Considerations by the Japan Bank for International Cooperation (JBIC).

The project has been identified as Category A for environmental and social considerations in the guidelines, i.e., projects with potentially significant and irreversible environmental and social impacts. PMU 85 had extensive experience in implementing foreign aid projects, including procurement, construction management, land acquisition, and other aspects of the project. Approximately 130 ha of the target area, where land needs to be acquired for the construction of the Cai Mep Container Terminal and the Thi Vai General Cargo Terminal, was devoid of housing and had secondary mangrove forests, crab, shrimp and fish ponds, and salt pans. Approximately 130 households with livelihoods depending on these areas were affected.¹¹ While the requirements of JBIC for environmental and social considerations were substantially stringent, VINAMARINE was not used to dealing with EIA matters at the time. Japanese environmental experts were dispatched to support the procedure. Subsequently, some measures were implemented based on the environmental management plan illustrated in the EIA report.

In order to ensure the safe navigation of the river, Ba Ria Vung Tau Province has issued a ban on fishing activities on the Thi Vai River. Households with livelihoods in aquaculture and fishing in the river were instructed to continue in the alternative site. No major objections were observed since there were substantial employment opportunities through the construction. In fact, the population influx to Tan Thanh

⁹ When the ODA of Japan resumed in 1992, a VINAMARINE representative participated in a training course in Japan, which is said to be the beginning of technical cooperation in the maritime sector. Since 1998, experts from the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and other organizations have been occasionally dispatched to Vietnam (based on an interview with a former MLIT expert).

¹⁰ A Vietnamese port sector official said that initiating the development of the CMTV port without Japanese involvement would have been difficult as HCMC did not want to change its monopoly on the port business, which is a source of their tax revenue.

¹¹ PMU85. Thirteen temporary houses for work were affected, but the house owners also owned houses at the town centre, thus no involuntary resettlement was involved.

district, where the port is located, was massive along with the construction of industrial estates. The population has doubled in 10 years with an average annual increase of 7.5%, from 107,000 in 2009 to 221,000 in 2019. The port had brought stable income far greater than the income earned from salt paddy fields and aquaculture.¹²

After the start of construction, there was a minor collision between a fishing boat and a construction vessel. This turned out to be due to a superstition that had circulated among the fishermen; Crossing a large vessel would result in a big catch in the nearby waters. Immediately, PMU85 conducted a careful briefing in the fishing village to ensure that the fishermen would stop navigating dangerously.

The management of the dredged soil also complied with the guidelines so as not to exceed the standard values. For the reclamation of the terminal site and ground improvement works, earth and sand equivalent to about 2.7 cups of Tokyo Dome (about 3.3 million m³) was brought in from neighbouring areas for a short period of time. All environmental aspects were taken into consideration through the construction, including the destruction of nature at the earth and sand extraction sites, traffic congestion on the transport routes, noise, and dust and water pollution. The dredged sediment was disposed of in a dumping ground constructed in the open sea, 5 km from the shoreline. Special attention was paid to the impacts of dredging at the Can Tho Ecological Protected Area¹³ in HCMC, located opposite of the proposed terminal site. The Vietnamese side submitted the EIA report, including the section of the access road to National Highway 51, to the Ministry of Natural Resources and Environment (MONRE). EIA procedures were carried out in accordance with Vietnamese national laws and standards as well as the environmental and social measures were studied and implemented per the guidelines of JBIC. Consequently, monitoring was also requested from a third-party environmental consultant. This port project is regarded as the first in Vietnam to follow and apply the national EIA procedures and guidelines for environmental and social considerations sufficiently.¹⁴

2.2 Adopting construction methods using Japanese technology and long-term technology transfer period from Japanese engineers

The project mainly consisted of the (i) construction of Cai Mep Container Cargo Terminal, (ii) construction of Thi Vai General Cargo Terminal, and (iii) the dredging of the navigation channel, with the berths of both terminals being designed to allow Panamax type vessels¹⁵ full of cargo to be docked at the terminals. The cargo handling equipment includes gantry cranes for efficient loading and unloading of containers, transfer cranes for moving containers around the terminal, and multi-purpose quay cranes. In

¹² Based on interview with PMU85

¹³ In 2000, UNESCO designated it a "Can Gio Mangrove Biosphere Reserve," an ecological reserve that aims to combine the conservation of the ecosystem with the use of its resources. Can Gio Mangrove. from United Nations Educational, Scientific and Cultural Organization website: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/asia-and-the-pacific/vietnam/can-gio-mangrove> (Confirmed July2021,)

¹⁴ Based on interview with PMU85

¹⁵ A Panamax vessel is a ship of 50,000 deadweight tons, 267 m in length, 32.2 m in width, and 14 m in required quay depth, built to fit the width of the mouth of the Panama Canal.

addition, by increasing the depth of the shipping channel through dredging, the terminal has allowed Panamax-type cargo ships to make a 24-hour round trip from the open sea to the terminal, which is the first in Vietnam.

The project was also implemented as the Special Terms for Economic Partnership (STEP), applying the Japanese soft ground improvement and other technologies. Since the area is an estuary with 15 to 37 m of extremely soft soil, Japanese companies were expected to make a technical contribution.¹⁶ The CDM is a cement-based deep mixing process¹⁷. It is an excellent method that ensures strength and reliable construction management and greatly reduces the construction period. In Vietnam, there have been some small-scale applications of this method but few experience in construction on water as well as carrying out large-scale construction work within a limited time with the use of larger scale materials and equipment that Japanese companies own.¹⁸ Many terminals have been built at CMTV, as described in section 3.1, but some of those not using the CDM method have swollen or expanded concrete. As a result, the MOT is convinced of the advantages of the CDM method in monitoring the terminals.



Source: Penta-Ocean Construction
**Ground improvement applying
CDM (Thi Vai General Cargo
Terminal)**

On the other hand, in 2010, there was a collapse of a slope at a construction site at the Thi Vai Port. An independent expert soon reviewed the incident and found that risk management had been successful in preventing sediment from spilling into the navigation channel and damaging other adjacent terminals.¹⁹ Although the project was delayed due to these incidents, the management of the project, including safety and environmental management, was considered higher standard than of other port projects in Vietnam according to Vietnamese stakeholders.

The implementation plan for the project started with the signing of the L/A in March 2005 and was to be completed in September 2013. The actual start of operations (i.e., construction completion) was in April 2015, which is 122 months instead of the planned 94 months, a delay of 130%.²⁰ First of all, international prices for materials and fuel as well as local labour costs at the time of tendering were high. Since 2004, before the onset of the Lehman shock, the inflation rate has been nearly 8% for three consecutive years. Accordingly, the lowest prices tendered were significantly higher than the planned prices. In terms of design standards, the only standards available were those of the United States before the Vietnam war 50 years ago. The reference points were inadequate for dredging a 14 km navigation channel including bends.

¹⁶ PMU85

¹⁷ In the construction of the terminal of SP-PSA, a joint venture between Saigon Port and PSA, the terminal operator in Singapore (opened in 2009 in Chi-Bai area), the design-build method was required to shorten the construction period. However, a Japanese company (Penta-Ocean Construction) won the bid with a technical proposal for ground improvement using the CDM method. The technology and experience of the CDM method were used for this project.

¹⁸ VINAMARINE, PMU85

¹⁹ Mid-term review of Safety Measure of Japan ODA loan in Vietnam (2010) JICA and PMU85.

²⁰ Ex-Post Evaluation Report of the project

The project scope, subsequently, had to be reviewed and changed to exclude the access road and bridge from the National Highway 51 to Cai Mep Port, water and electricity supply facilities, sewage and drainage facilities and other utilities, and navigation signage buoys from the scope covered originally by the ODA loan. Then, those had to be financed by Vietnamese Government's own funds.

In this project, Vietnamese engineers learned a wide range of technologies, equipment, schedule management, safety, and environmental management methods from Japanese engineers over a long period of time, which was highly appreciated. Through this project, not only the technical aspects such as CDM, but also the management method of large-scale construction and the know-how of environmental and social considerations were passed on to the Vietnamese side, which laid the foundation for the future development of Vietnamese consultants and contractors. The Vietnamese consulting company engaged in this project has contributed to the construction of other terminals in Vietnam but has also been involved in port projects in Pakistan, Myanmar, UAE and other countries, covering a wide range of activities from design, construction, and geological survey to environmental and social considerations. It is no exaggeration to say that this project has laid the foundation for Vietnamese port consulting companies to expand their business overseas.

Chapter 3 Changes in the external context after the decision on the ODA loan project

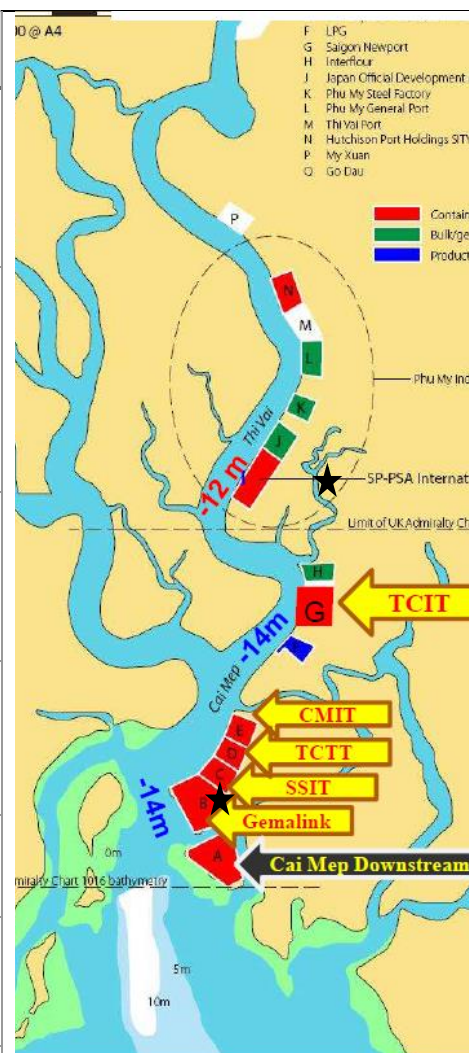
3.1 Increased competition due to the boom in terminal investment in the CMTV region

Port development along the Thi Vai River began in 1996, when a French-Danish consortium invested in the Phu My area upstream and opened a general cargo terminal. Although a general port terminal dedicated to resources existed, it did not handle containers before 2005, when the ODA loan project was decided. Although it was known that the area along the Thi Vai River was a suitable candidate for a deep-sea port, stable navigation channels were not yet in place because dredging projects were not approved for foreign investment and could only be funded by the Vietnamese government, including ODA. Therefore, from the start, the area was overgrown with mangrove forests and there was no access road. Neither bridge nor roads connecting the project's investment area with National Highway 51 were built previously.

Once it was announced to build a channel with a depth of 16 m and 14 m upstream to allow large container ships to pass in alternating directions 24 hours a day with the assistance of Japan, all the major overseas terminal operators showed an interest in CMTV, and the decisions to invest were done immediately. The master plan by JICA suggested that a terminal with six container berths in the Thi Vai area and eight in the Cai Mep area could be completed by 2020. The Japanese side envisaged a series of process: support the preparation of the master plan and D/D, provide policy and technical support for the introduction of private operators, provide F/S fund for the participating Japanese companies into the port terminal, and carry out dredging of the shipping channel and construction of the terminal through an ODA loan. Ultimately, Japanese companies were most expected to bid as terminal operators.

Table 1 Major port terminals at CMTV

Terminal	Berths, Capacity	Opening /Current Status	Operator
N. Sai Gon International Terminals Vietnam (SITV)	730 m (3) 1.2 mil TEU	2010 -bulk vessel only	Hutchison Port Holdings (Hongkong, 70%) Saigon Investment Construction (30%)
M.Thi Vai International Port (TVP)	300m, 140m, 175m	2018-bulk vessel only	Kyoei Steel, Tatsumi Shokai, Japan Overseas Infrastructure Investment Corporation (JOIN) ²¹ , Hoang Giang Trading Viet Nam Steel Corporation
J. Thi Vai General Cargo(TVGP)	300m x2	2013-bulk vessel only	[ODA loan] Thi Vai General Port JSC (Saigon Port, and other 4 domestic companies) ²²
I. SP-PSA International Port (SP-PSA)	600 m (2) 0.75 mil TEU	2009 -bulk vessel only	PSA International (Singapore, 49%), Sai Gon Port (36%), VINALINES (15%)
H. Tan Cang - Cai Mep Container Terminal (TCCT)	300 m 1.5 mil TEU	2009	SNP (74.46%), others (25.54%)
G. Tan Cang – Cai Mep International Terminal (TCIT)	890 m (3) 1.2 mil TEU	2011 (9 call / week)	SNP (36%), MOL (Japan, 21.3%), Hanjin Shipping (Korea, 21.3%), Wanhai Lines (Taiwan, 21.3%)
E. Cai Mep International Terminal (CMIT)	600 m 1.1 mil TEU	2011 (4call / week)	APM Terminals (Denmark,49%) Sai Gon Port (15%) Vinalines (15%)
D. Cai Mep International Container Terminal (TCTT)	600 m (2) 0.75 mil TEU	2013 (6call / week)	[ODA loan] Vinamarine, leasing to SNP 30 years
C. SP-SSA International Terminal (SSIT)	600 m (2) 1.57 mil TEU	2012 (5call / week)	SSA Holdings International (US 50%) Saigon Port (38.93%), Vinalines (11.07%);
B. Terminal Link Cai Mep (Gemalink)	1,500 m 1.5 mil TEU	2021	CMA-CGM (France) Gemadept ²³ (Vietnam)



F; LPG, H:Interflour, K: Phu My Steel Factory, L:Phy My General Port, M ;Thi Vai Port, P;My Xuan, A: Wait for Approval
★ Terminals constructed under the ODA loan
Source : TCIT

Figure 1 Location of the Major port terminals at CMTV

Source: SNP, TCIT, VINAMARINE, JOIN, etc.

²¹ Japan Overseas Infrastructure Investment Corporation

²² Saigon Port (subsidiary of VINALINES), Phu My General Oil Service, OTRAN Vietnam (used to be Vina Commodity), Southern Salt Corporation, and Hung Thai Oil Marine Service established in July 2014.

²³ Sumitomo Corporation, JOIN, and Suzuyo have a 10% stake in GEMADEPT CORPORATION, a leading company in the port and logistics business, through a joint venture established locally by them.

Note : Underlined J, D were financed by the project. SITV and SP-PSA faced lacking container cargos and transformed to be general cargo terminals. N, M, J,L for general cargo, SSIT was once closed due to insufficient cargo. Excluding TCIT and CMIT, the berth occupancy ratio in 2010s were very low.

TEU: Twenty-foot Equivalent Unit (used in container handling volumes). One 40-foot container is 2 TEUs.

In reality around 2010, however, the development of new terminals, such as those shown in Figure 1, led to a situation where competition for collecting cargoes quickly became severe. Investment in port terminals is based on the approval solely by the Ministry of Planning and Investment (MPI), in accordance with the Law on Foreign Investment and the Company Law. The concept of a public terminal does not exist. The terminal development project would have been possible once it had been approved by both MPI and Ba Ria-Vung Tau Province, which had jurisdiction over the port area²⁴. The MOT, aware of the details of the Master Plan, explained to the foreign operators that the number of terminals would be increased in stages as demand increased. MOT, though not having the authority to approval of investment, hoped to avoid a situation where several terminals would be opened at the same time. Initially, there was no consensus on phased development among stakeholders. Some Vietnamese officials regard it as a positive, and advantage since the world's leading operators compete next to each other in terms of technical and financial aspects.

Conditions of facilities, water depth, etc., are substantially important for container cargo handling. The water depth is shallow at 12 m in the upper side of the Thi Vai River. As container ships are getting larger, both SITV (N) and SP-PSA (I) terminals, as shown in Figure 1, gradually lost competitiveness since large vessels could not be accommodated. Finally, in 2013, they stopped handling containers²⁵. There are several terminals in the CMTV area that have been put into operation by earlier private investment. The downward trend in international cargo has become apparent due to the global financial crisis and the Lehman Shock in 2008. The Japanese company had hoped to acquire the concession to operate the container terminal developed under the project but the plan was abandoned after considering the road infrastructure and various other issues described thereafter.

On the other hand, through Japan's technical cooperation and other means, the VINAMARINE had acquired the know-how to select the operator of the terminal developed in the project through international bidding. However, the Vietnamese government had concerns over the risk of the international bidding as an unexpected foreign company taking over the operation of the CMTV Port. The Vietnamese side subsequently cancelled the international bidding for the two terminals under the project²⁶. A JV of Vietnamese companies won the concession to operate the Thi Vai General Cargo Terminal (TVGP), while VINAMARINE would be the owner of the Cai Mep International Container Terminal (TCTT) and SNP under the MOD would operate on a 30-year lease.

TVGP, a general cargo terminal built under the project, immediately exceeded its target cargo handling volume. On the other hand, the situation became an excessive competition among several rapidly developed container terminals. TCTT, a terminal for containers built under the project, handled only about 100,000 TEU of cargo in 2015, just after the opening of the port. The berth occupancy rate was less than

²⁴ Based on interview with MOT

²⁵ As shown in Table 6, no container cargo handled since 2013.

²⁶ Based on interview with VINAMARINE

10%, which made those involved concerned about the future consequences.

3.2 Delayed relocation of port terminals and newly developed ports in HCMC

(1) Relocation of the port complex in the centre of HCMC

In the 2000s, the cargo traffic in Vietnam increased dramatically, leading to congestion on the shipping routes around HCMC and worsening road traffic congestion. The central port of HCMC is in the city centre about 85 km up the river (Long Tau Route) which is distorted from the coastline, the water depth is shallow as 11 m at most. Traffic congestion caused by port-related vehicles and the resulting air pollution have become problems for the public. From the point of view of urban planning and industrial development to stimulate foreign trade, it is apparent that continuing Saigon Port (Inner City ports in HCMC) as both local and international cargo handling port is unsuitable. There were already proposals for its relocation as early as in the 1990s.²⁷

Globally, there are precedents for relocating urban ports to the suburbs, such as Bangkok, Busan, and Shanghai. The MOT has stated that it would be desirable to relocate the ports inner city of HCMC as soon as possible, except for the passenger terminal. The decision on the relocation plan was announced by the prime minister in 2005²⁸, but HCMC officials have been slow. The opening of the SP-PSA terminal, the first container terminal of CMTV, was already about to operate (2009) at that time. The deputy prime minister and the MOT made a concerted effort to lobby the Ho Chi Minh City People's Committee to relocate the central port of HCMC to CMTV (See Table 2).



Source : Relocation of Ho Chi Minh City Sea Ports, Fulbright Economics Teaching Program, 2012

Figure 2 Location of inner-city ports and their planned relocated area

Table 2 Chronology of lobbying the central government to relocate the port in central HCMC

28 April 2008	Formation of Port Relocation Steering Committee
12 May 2008	First Steering Committee Meeting with the Minister of Transport stressing the importance of land-use planning for future inner-city ports
01 April 2009	Transport Minister officially requested the Prime Minister to order Ho Chi Minh City People's Committee to <i>soon</i> approve the inner-city port land-use plans.
18 June 2009	Deputy Prime Ministerial directive set the land-use planning deadline for <i>Sep 2009</i> .

²⁷Based on Interview with HCMC Economic University, June 2021.

²⁸ Decision 791/QĐ-TTg on the approval of the Detailed Master Plan of Sea Ports in HCMC, Dong Nai, and Ba Ria - Vung Tau, 12 August 2005

13 January 2010	Deputy Prime Ministerial directive set the land-use planning deadline for <i>Feb 2010</i> .
10 August 2010	Deputy Prime Ministerial directive set the land-use planning deadline for <i>Q4 2010</i> .
29 March 2011	Deputy Prime Ministerial directive set the land-use planning deadline for <i>Jun 2011</i> .

Source: Official documents 219/TB-BCĐ dated 27 May 2008, 1949/BGTVT-KHĐT dated 1 September 2009, 178/TB-VPCP dated 18 June 2009, 11/TB-VPCP dated 13 January 2010, 217/TB-VPCP dated 10 August 2010, 70/TB-VPCP dated 29 March 2011, and 132/TB-VPCP dated 2 June 2011.

Table 3 The list of Ports inner city of HCMC and their relocation plans

Port (Owner)	Berth length	Area (ha)	Vessel Size (DWT*)	Relocation Plan*
Sai Gon New Port (MOD)	733 m	31.9	5,000	To Cat Lai (Dong Nai River, HCMC) by 2006 and to Cai Mep, Completed and redeveloped by the VINHOMES
Ba Son Shipyard (MOD)	754 m	26.4	6,000–10,000	To Cai Mep, and Completed, and redeveloped by the VINHOMES (Figure 4)
Sai Gon Port, Nha Rong & Khanh Hoi Terminals (Vinalines, MOT)	1,750 m	32.2	10,000–30,000	To Cai Mep (Ba Ria Vung Tau [BRVT]) and Hiep Phuoc (HCMC) converted to passenger terminal and maritime service facility. <u>Not completed</u> .
Sai Gon Port, Tan Thuan Terminal	995 m	13.6	10,000–30,000	Relocated to Hiep Phuoc
Tan Thuan Dong Port	149 m	2.9	15,000	Relocate by 2010. <u>Not completed</u> .
Ben Nghe Port (HCMC)	816 m	32.0	10,000–30,000	Change of use after 2020 or terminate operation at the end of land lease period. <u>Not completed</u> .
VICT Port (JV NOL group of Singapore, MOL)	678 m	28.3	15,000–20,000	
Vegeport (HCMC)	222 m	7.2	20,000	
Lotus Port HCMC	275 m	6.0	30,000	

Source: Thanh, N. X., & Pincus, J. (2011). Ho Chi Minh City Sea Port Relocation: A Case Study of Institutional Fragmentation (prepared for the World Bank). Interview survey in 2021.

* The relocation plan is from the Prime Minister of Vietnam, Decision 791/QĐ-TTg on the approval of the Detailed Master Plan of Sea Ports in HCMC, Dong Nai, and Ba Ria–Vung Tau, 12 August 2005.

Notes: Deadweight Tonnage (DWT) is a unit of measurement for the maximum amount of cargo, etc., that can be carried on board a ship. Location is referred in Figure 3.

However, the legal procedures for converting the land use plan, from port to commercial, have been slow. It is not possible to trade the rights of the occupied land and use the capital gain as a transfer cost for CMTV.²⁹ This continues to make it difficult for private companies, including those engaged in warehousing near the port, to relocate.

Three working groups, each headed by the Deputy Minister of Transport, the Deputy Minister of Finance, and the Deputy Commissioner of HCMC, were formed in 2008 to develop a workable implementation plan for the infrastructure and costs of relocation. It was not only the initiative of the MOT,

²⁹Procedures for real estate transactions differ between private and state enterprises. If a private company wants to use land owned by a state-owned enterprise to do business, it is forced to pay an exorbitant lease fee to the state-owned enterprise, avoiding the complicated procedures imposed on private enterprises. This means that few private companies are willing to buy the port (the Vin Group, which is redeveloping Ba Son Port, is an exception as it is one of the leading conglomerates in Vietnam), and the state companies that own the port are unwilling to give up the immediate cost of running the port and cannot afford the cost of relocating to Cai Mep. The situation has persisted for more than a decade.

but also that of the Deputy Prime Minister, with the cooperation of the Ministry of Finance (MOF) and HCMC, to change the land use plan and make the port space suitable for use on the city's bay. However, at the time, the roads connecting to CMTV were not well constructed, nor was the infrastructure such as water and electricity. In addition, the terminal operated by the VINALINES, which should have been recommended for relocation, was in court and faced financial difficulties and could not be relocated.³⁰



Source : -SANKYU

Figure 3 Ports of HCMC

Shown in Table 3, the relocation of several terminals operated by different organisations had only slight progress. As of 2021, merely two terminals upstream of the Saigon River have been relocated. These sites were under the jurisdiction of the MOD but have been transferred to HCMC and are being redeveloped by a private company, VINHOMES (Figure 4). The remaining sites, such as Khanh Hoi, Tan Thuan, and Ben Nghe VICT, have yet to be relocated.

There is also pressure from port business sector in HCMC that strongly opposed the relocation of ports and warehouses.³¹ Developing large-scale ports elsewhere to increase the economic benefits for the entire country has been difficult without a consensus with HCMC. The interests of HCMC have been prioritized as the prime port city of the south.

(2) New ports developed in the outskirts of the HCMC (Cat Lai and Hiep Phuoc Ports)

In order to guarantee the income from the existing port terminals, HCMC has been reluctant to transfer



Source : <https://www.alovesinh.com/wp-content/uploads/2021/11/giat-ghe-sofa-chung-cu-vinhome-bason-quan-1.jpg>

Figure 4 Before and After the Ba Son Port Redevelopment by Vinhomes

³⁰ Based on interview with MOT, June 2021.

³¹ Based on interview with the HCMC Economic University, June 2021.

international cargo to CMVT port terminals in other provinces, though it acknowledged the rationality of relocating urban ports to reduce congestion. The SNP, which had a terminal in the centre of Ho Chi Minh City, moved to a new location on the Dong Nai River, 16 km to the east, in 2006 and opened it as Cat Lai Port. It also built its own connecting road from the city centre. The terminal has been expanded repeatedly, which lead the annual cargo volume increased from 3.5 million TEU in 2014 to 5.4 million TEU in 2015. Since the establishment of the terminal, the number of cargos handled by the terminal has been increasing due to its easy accessibility from the surrounding industrial parks, modern facilities for import and export customs, and the advantage of inland water transportation. With approximately 81 calls per week from Asian countries, it is the largest and most modern container terminal in Vietnam³².

A large port development in the Hiep Phuoc area along the Soai Rap River, 16 km southwest of HCMC, was also initiated in the 2000s. Japanese experts showed certain understanding that it would improve logistics in the Mekong River Delta to the south, but they were reluctant to agree for large scale development owing to concerns that the estuary would be buried.

However, in 2005, Dubai Ports World (DP World), one of the world's largest port operator companies, signed a JV contract for the construction of the Saigon Premier Container Terminal (SPCT), which began operations in 2009. Belgium also started an ODA project in 2009 for dredging of the navigation channel to keep the depth of the port at 12 m³³. The berth is 950-m long and has a handling capacity of 7 million TEU³⁴. Thereafter, SNP and Saigon Port also decided to invest in the terminal and started operations. The desire of HCMC to secure its interest in the port by building a new terminal within its jurisdiction coincided with the interests of the foreign investors.

Table 4 Profiles of the new port developed in the outskirts of HCMC

Name of Terminals		Established	Number of Berth, length	Annual Handling Capacity	Area	Depth alongside berth
Cat Lai		Aug. 2007	9, 1 for barge/ 2,040 m (Dong Nai River)	45,000 DWT (5.4 mil TEU)	160 ha	12 m
Hiep Phuoc	SNP	Dec. 2014.	2 / 420 m (Soai Rap River), 4 / 253 m (Dong Dien River).	50.000 DWT (Soai Rap River), 2.000 DWT (Dong Dien River)		13.4 m
	SP	May 2009	3 (Soai Rap River) / 800m	50.000 DWT.		9.5 m
	SPCT	Oct. 2009	2 / 500 m	7 mil TEU	40 ha	9.5 m

Source: SNP Presentation Mar 2021 Information collected by the author.

Regarding the development of this port in Hiep Phuoc, stakeholders of the maritime sector under MOT and Japanese maritime experts have the same opinion because of the apparent impact on the container throughputs at the CMTV ports, which was previously determined for development. However, it

³² SNP website <https://saigonnewport.com.vn/en/library/Pages/library.aspx> Confirmed June 2021

³³ According to the person concerned to project, the Japanese side at the time also discussed the Belgian side to reconsider its implementation, saying that the CMTV port development had been decided to hinder its development.

³⁴ SPCT Website <https://www.spct.vn/en/facility/> Confirmed July 2021

was entirely possible under the development plan of HCMC.

(3) Background of challenges for sharing the functions between ports in HCMC and CMTV

The Japan side prepared for the construction of the CMTV port terminal with VINAMARINE and supported the project for the reform of the port management system (technical cooperation project) to develop regulations for the entry of the private sector into port operations, and from the preparation of the concession plan to the preparation of bidding documents. However, discussions about port with HCMC were limited³⁵. In an economic point of view, the Japanese side expected the Vietnamese side able to prepare the necessary documents for import and export cargos to be almost entirely transferred from the existing HCMC upon the completion of the CMTV terminal port, by revising laws and regulations, However, HCMC and other stakeholders who operate the port inside HCMC have been reluctant to relocate the container terminal due to various reasons.

The VINAMARINE has no authority to restrict cargo at ports of Cat Lai as well as Hiep Phuoc (in HCMC). The importance of a strong management body, such as the Port Management Board or Body (PMB) is required to demarcate the functions. Not only did the Japanese experts suggest this, but it is also clearly stated in the Vietnamese maritime laws.³⁶ The MOT, as well as many private companies and local governments, have expressed the need for such a system but failed to form it.³⁷ The Ba Ria-Vung Tau Province also believes the necessity in establishing a PMB to manage and implement the plan beyond the companies operating the ports and the provincial and local governments that have jurisdiction. However, there are multiple authorities involved, and it can only be hoped the government can lead the appropriate policy direction.

Politburo, 16-member body³⁸, has the authority over the Central Executive Committee of the Communist Party that, in turn, controls the policymaking in Vietnam. The General Secretary of the Communist Party, the Prime Minister, the Chairman of the People's Assembly, the Minister of Defence, the Minister of Public Security, the Minister of Finance, the Secretary of the Party Committee of Hanoi City, the Secretary of the Party Committee of Ho Chi Minh City, etc., are included. However, the Minister of Transport, executive agency of the project, Secretary of the Party Committee of Ba Ria Vung Tau Province, where the CMTV port is located, likewise many other provinces are not included in Politburo. In the light of the decision to build a large deep-water port in the CMTV area and develop it as an international port through the ODA loan, stakeholders concerned should have had a consensus of the comprehensive port development in Southern Vietnam from the project formation stage in order to ensure that the benefits

³⁵ From Japanese side sources. There were substantial meeting opportunities with HCMC and Japan owing to several transportation projects in HCMC were on going.

³⁶ Maritime Code (Law No.95/2015/QH13 Vietnam Maritime Code, Article 88,Article 86i Port Management and operation authority: It is indicated that an organisation should be set up to manage the investment, construction, and operation of both the land and water areas of the port.

³⁷ According to Vietnamese stakeholders, the comprehensive involvement of the Ministry of Justice is necessary to ensure consistency with laws and other regulations outside the jurisdiction of the MOT (and other relevant ministries), but it has been difficult to reach agreement within the Vietnamese government to proceed to such a stage.

³⁸ 16 members in 2010-2015, 18 members in 2021~2026

are worth the huge investment.

As HCMC was not a direct stakeholder to the project, JICA officials had no direct opportunity to discuss the port relocation. However, at that time, HCMC was implementing several large infrastructure projects under Japanese ODA, and the Japanese Embassy and JICA have reiterated to policymakers on various occasions the importance of concentrating international cargo at the CMTV port terminals to improve efficiency. The case of the Port Authority of Thailand (PAT) was quoted, in particular. PAT, in the late 1980s, set a 1 mil TEU limit on the volume of cargo handled at the Bangkok Port and shifted the volume of cargo at the newly built Laem Chabang Port³⁹ in order to reduce congestion. The importance of setting caps on the cargo volume handled in HCMC and developing the riverfront on former port sites for greater economic benefits were also frequently suggested. However, with the complex and fragmented powers of the Vietnamese maritime sector, the ministries and local governments concerned were unable to reach a consensus and each development plan was implemented piecemeal.

3.3 Improving lagging connectivity

Another challenge for the CMTV Port to function as a port is the development of roads to transport cargo from the Mekong Delta to HCMC and Binh Duong and Dong Nai provinces, which are huge consumption areas and where many factories are located. These roads were not adequately considered in the JICA study of 2002 when the master plan for the port was prepared. The inner port roads and access roads, developed simultaneously on ODA Loan, were developed at an early stage because the roads in the port must be of standard to accommodate trailers carrying containers. HCMC and Dong Nai Province access has been provided by the expansion of the existing National Highway 51. However, the highway is not only for large cargo vehicles but also for regular vehicles. Congestion caused by the inevitable increase in cargo vehicles is unavoidable. For this reason, both Japanese and Vietnamese officials have been urging the construction of the Phuoc An Bridge, connecting the Bien Hoa-Vung Tau Expressway between Bien Hoa in Dong Nai Province and Vung Tau in Ba Ria-Vung Tau Province with the Ben Luc-Long Thanh Expressway at the northern end of the port road.⁴⁰


Ba Ria-Vung Tau Province repeatedly lobbied the central government and MPI, responsible for ODA funding, to realize these two projects urgently. However, after several years of unsuccessful requests, the project was not pursued and could not be implemented until the national budget became available.⁴¹ The major road transportation projects related to the project is summarized in Figure 5.

³⁹ Port of Authority of Thailand website: <http://www.port.co.th>.

⁴⁰ Phouc An Bridge will improve the access to HCMC considerably. Japanese companies reiterates the need for urgent construction

⁴¹ The Phouc An Bridge was not given a high priority in the MPI as it is part of the port road and is neither a national road nor an expressway. The Bien Hoa-Vung Tau Expressway was withdrawn from the loan by the Vietnamese side since a total of 813 households (757 households in Dong Nai Province and 56 households in Ba Ria Vung Tau Province) had to be relocated and it took time to acquire land for the project.

Table 5 The Condition of Connectivity around CMTV



Project	Length (Lane)	Implemented by	Status
HCMC Outer Ring Road 3*	90 km	VND55.8 trillion (\$2.4 billion) Dong Nai, Binh Duong and Long An, and link up with the Ben Luc – Long Thanh Expressway and Ho Chi Minh City – Trung Luong Expressway.	
HCMC Outer Ring Road 4*	200 km	VND99 trillion (\$4.3 billion). Ba Ria-Vung Tau, Binh Duong and Dong Nai, Connects CMTV and Hiep Phouc	
HCMC-Long Thanh-Dau Giay Expressway, and Expansion	55 km (4-6), +24km	Vietnam Expressway Corporation financed by ODA (ADB, JICA)	Completed 2018 (Initially planned to be completed in 2012)
Bien Hoa – Vung Tau Expressway	77.6 km (6-8)	BOT VND18.8 trillion (\$817.4 million) 35 % will be financed by public investment fund	Connected with Long Thanh International Airport, CMTV Port, to be completed by 2025
Highway 51 Expansion	21.3 km (6)	BOT	Completed 2012
Phouc An Bridge**	3.5 km	Ba Ria Vung Tau (BRVT) Province	Approved 2020 (targeted for 2025)
Inter-Port Road	21 km (6-8)	BRVT People's Committee Government bonds (ODA)	Completed 2014, as part of ODA project
Provincial Road 965	8.5 km (4-6)	Ministry of Transport, PMU 85	Completed 2011

Source: Interview with Baria Vung ,JICA A Study On The Current Situation of Ports and Strategies for Optimized Container Port Operation in Southern Vietnam (2013)“Dream Incubator

* Ring Road of HCMC which improve the accessibility to Ba Ria Vung Tau Province

<https://e.vnexpress.net/news/business/economy/hcmc-wants-to-speed-up-lagging-ring-road-scheme-4112759.html> (June 9, 2020 VNExpress

**::Reported budget is 4.9 tri VND MOT 2 tri VND METI FS estimated the cost 25.5 billion JPY, Approx. 5.6Tri.VND

<https://tuoitrenews.vn/news/business/20200806/213mn-bridge-to-tap-into-southern-vietnam-ports-potential/55977.html> (August 6 2020,Tuoi tre News)

The F/S of Phouc An Bridge, located at the northern end of the north-south longitudinal road running along the Thi Vai River from CMTV Port and further north to the Ben Luc–Long Thanh Expressway, was funded by the Ministry of Economy, Trade and Industry (METI)⁴², while F/S of the Bien Hoa Vung Tau Expressway was financed by JICA⁴³.

The Phuoc An Bridge crosses the Thi Vai River and connects to the road to Phuoc An Industrial Port on the other side of the CMTV Port and further north to the Ben Luc–Long Thanh Expressway. The location is critical. Once built, it will dramatically improve accessibility not only from the Nhon Trach Industrial Park but also from industrial parks in Long An Province to the west of Ho Chi Minh City's Greater Economic Zone and the Mekong Delta to the south. The Bien Hoa-Vung Tau Road is a high standard road which will

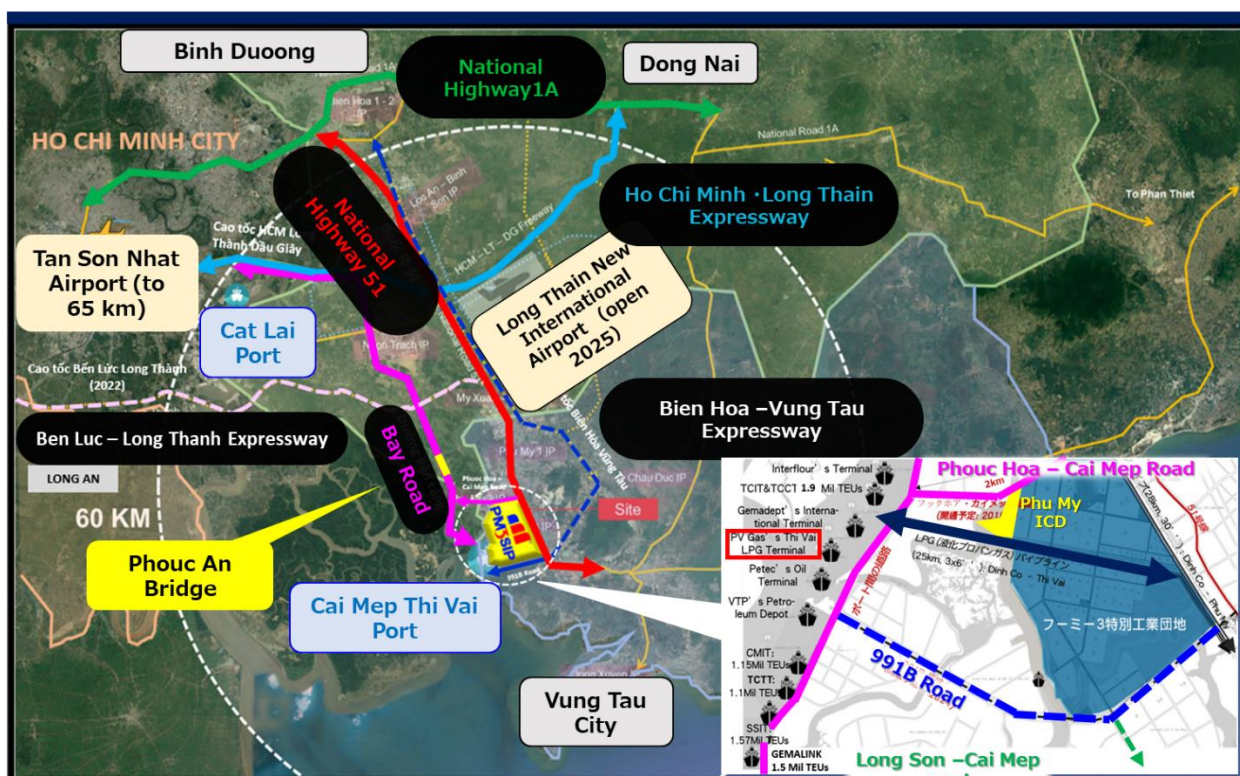
⁴² The Project Formation Study for the Phouc An Bridge Construction Project (March, 2011).

⁴³ JICA Bien Hoa -Vung Tau Express Way (PPP) Study (2013) .

greatly improve access from outside Ba Ria-Vung Tau province.⁴⁴

The cost estimated for the Phuoc An Bridge⁴⁵ by the METI F/S study was regarded as expensive. In order to start the construction as soon as possible, Ba Ria-Vung Tau Province reviewed the design again with its own funds, and decided to construct the bridge an extra-dose bridge which can be built by domestic consultant and contractors, and considered the BOT approach for finance.

Despite the high Economic Internal Rate of Return (EIRR) of a cable-stayed bridge over 3 km long, the Financial Internal Rate of Return (FIRR) was only a few per cent, which meant that the bridge needs public finance. Finally, the project was approved for construction in 2020 under the budget of Ba Ria Vung Tau and the Ministry of Transport, with construction of the toll-free bridge to begin in 2022 and be completed in 2025.



Source: Thanh Binh Phu My JSC Presentation material, 2021.

Note : Construction of the Phuoc An Bridge (yellow part), which connects Ba Ria-Vung Tau and Dong Nai provinces, is scheduled to start in 2022 (as of 2021).

Figure 5 Master Plan of Transportation surrounding of the CMTV Port

The Bien Hoa Vung Tau Expressway, a bypass of the National Highway 51, did not lead to the ODA loan project. It is, however, being prepared on a BOT basis on the basis that the Vietnamese Government shoulder the cost of acquiring the land, that would make the project more financially viable. However, it is a big blow that critical infrastructure such as the Phuoc An Bridge, which has a direct impact on the operation of the CMTV Port, has not been developed for more than 10 years since the opening of the first

⁴⁴ Prior to the inauguration of CMTV port under the project, MLIT, Japan and MOT discussed about the Phuoc An Bridge as the urgent issues in 2015.

⁴⁵ ADB reviewed the Phuoc An Bridge papers and concluded that the FIRR was too low to be financed.

terminal. At the Logistics Seminar in Ba Ria-Vung Tau Province held in 2020, Japanese companies expressed their concern over the slow increase in the capacity utilization rate of the large-scale deep-sea port, a national project, is caused by insufficient road infrastructure⁴⁶. They reiterated their request for coordination with neighbouring provinces and relevant ministries, as the issues of large infrastructure projects would not be solved by Ba Ria-Vung Tau Province alone.

3.4 Increasing cargo demand in Ba Ria Vung Tau province

(1) Limited-service environment leading to high costs - comparison with the Cat Lai Port Area

The pavement condition of the access roads from the National Highway 51 to the CMTV terminals has improved with the progress of the project. However, access roads to HCMC, the surrounding industrial parks, and the Inland Container Depot (ICD)⁴⁷ are lagging, as mentioned above. As a result, even though the port facilities are in place, the development of logistics-related investments targeted for expanding business on the premise of handling more cargo has not progressed at the opening of the CMTV port.

Cat Lai Port in HCMC is served by 81 weekly liners from 12 Asian countries (2021). It is linked to the ICD in HCMC by land and water. Naturally, shippers in HCMC and the surrounding industrial parks will find that transporting their goods to the Cat Lai port is more affordable. Having handled the overwhelmingly large volume of containers, Cat Lai port provides convenience for small cargo and advantages for all logistics services. In addition, customs officers sometimes give unclear instructions for import and export procedure. Naturally, shippers who have used ports in HCMC for a long time tend to prefer to use the same Cat Lai port where customs officers are familiar with the procedures.

Table 6 The difference of logistics service between Cat Lai port area and CMTV port area

Service	HCMC / Cat Lai Area	CMTV (as of 2015)	CMTV (as of 2021)
Forwarder	Logistics facility such as 3PL ⁴⁸ available.	No service of forwarders such as 3PL, etc.	The service coverage has not improved much.
Stock Point	Many ICD procure empty containers (against tight demand for excessive exports)	Empty containers need to be collected from Cat Lai	Forwarders such as Shirogane Transport Co., Ltd started the forwarder service. (2019) Ba Ria Vung Tau Province supports to secure land for logistics.
LCL (Less than Container Load)	Many Containers Freight Station (CFS) that adjust containers.	Must depend on CFS near Cat Lai	No container station as of now, but the factory compounds are used for loading.
Custom Clearance Service	Many agents	Only limited	Customs' centralized cargo inspection site under construction (operational 2021)
	HCMC / Cat Lai Area	CMTV (as of 2015)	An integrated centre for customs and other cargo inspection is to be built. An automated customs control system (VASSCM) has been introduced.

⁴⁶ The Logistics seminar held 4th September 2020.

⁴⁷ Container yards located inland, away from the harbour. By providing services for the storage and transshipment of marine containers used in international maritime transport, the company will improve the efficiency of marine container transport in inland areas.

⁴⁸ Provide comprehensive logistics services to shippers and have the know-how to reconcile inconveniences caused by the conflicting interests of shippers and carriers.

Service	HCMC / Cat Lai Area	CMTV (as of 2015)	CMTV (as of 2021)
			The needs of the food processing industry have also been investigated and preparations are underway.

Source: Feasibility Survey for logistics services for the Cai Mep Port activation (2016), Shirogane Transport. Co., Ltd.

Notes: CFS: Container Freight Station

VASSCM: Vietnam Automated System for Seaport Customs Management

After the opening of the CMTV port, there were no forwarders⁴⁹ to organise and manage the smooth logistics between shippers and carriers for some time, as shown in Table 6. Even the major advantage of being able to transport goods on European and American routes without having transshipment was not fully understood by companies in the Ba Ria-Vung Tau Province, where forwarders did not share information at the beginning. Thus, in some cases, the companies deliberately continued using Cat Lai Port. There are no stock points for distribution, and the container yards at each terminal are used for temporary storage. Facing a shortage of empty containers near the CMTV port where exports are overloaded, exporters from the CMTV port must source from the surrounding ports of HCMC and ICDs. Empty containers must be returned to the vicinity of Cat Lai Port for import. Costs increased due to the long physical transport distances of containers. Moreover, the need for procuring and returning empty containers on behalf of the company is not being met due to the lack of stock points and other facilities surrounding CMTV Port.

At present, 90% of the cargo arriving at CMTV Port is transported to Cat Lai Port, which is convenient to the industrial parks by barge in about 6-10 hours. The distances from CMTV Port to Cat Lai Port at 48 km by inland water transport and 77 km by land transport, thereby, make developing a land transport system difficult. CMTV Port remains to be a relay port.

In 2015, congestion at the Cat Lai port caused temporary delays in unloading containers because of the lack of space for their transport. Even though the heavy congestion near the Cat Lai port continues, facilities are gradually expanding and being modernized. In 2020, USAID is providing policy support to customs and HCMC to reduce congestion.⁵⁰

(2) Lobbying the Vietnamese Government

For the entire growth of the Vietnamese maritime sector, VINAMARINE recognizes the need to increase competitiveness by concentrating import and export cargo handlings in CMTVs and building a modernized transport system connecting directly at western markets. A World Bank report in 2014⁵¹ also mentioned the inefficient port sector of Vietnam that is due to the fragmentation of its jurisdictions, particularly in the south, and that even by 2020, CMTV ports may only operate at around 40% of their capacity, much to the dismay of Japanese and other foreign investors. It even described that further

⁴⁹ Agent for sea freight forwarding and handling, transporting cargo from the shipper to the vessel, importing and exporting on behalf of the shipper.

⁵⁰ USAID Supports Vietnam to Reduce Congestion at Cat Lai Port in Ho Chi Minh City (HCMC). (2021, January 29). Retrieved July 2021, from U.S. Agency for International Development website: <https://www.usaid.gov/vietnam/program-updates/jan-2021-usaid-supports-vietnam-reduce-congestion-cat-lai-port-ho-chi-minh-city-hcmc>

⁵¹ Efficient Logistics: A Key to Vietnam's Competitiveness. World Bank. (2014)

investment in CMTV ports should be avoided.

Naturally, Japanese officials were also aware of the state of port development in HCMC and the worsened throughput of the container terminal in the CMTV area since the opening year of 2009. In response to this situation, JICA conducted a study entitled *A Study on the Current Situation of Ports and Strategies for Optimized* (2013) and submitted a set of recommendations to the Deputy Prime Minister.⁵² In 2013, Saigon Port in central HCMC operated at 64% capacity, Cat Lai at 80%, and Hiep Phuoc at 20%, while CMTV Port was at merely 14%. Faced by the huge socio-economic losses that have been caused by insufficient cargo handled in CMTV port, this report stipulated the desired demarcation of ports and actions needed to develop more efficient ports, based on the following analysis.

1) Improving the environment of CMTV port

- Increase the number of loops
- Construct the necessary infrastructures, especially Phuoc An Bridge
- Promote the investment for logistics centre and acquire more cargo from neighbouring terminals and target to be an international hub port for direct transshipment for Europe and American markets.

2) Increasing the demand

- Move the demand to support the access of Cai Mep-Thi Vai port, and Develop ICDs (Mekong Delta, etc) for utilizing Cai Mep port
- Invite the barge service (e.g., subsidy from BRVT)
- Stop developing Hiep Phuoc (maintain the current capacity) and put a cap on ports in HCMC to avoid further congestion in Cat Lai Port and environmental pollution
- Reduce port charge

3) Expanding the demand in Ba Ria Vung Tau

- Consider the strategy and industrial policy with central government and Ba Ria-Vung Tau Province

4) Establishing port authority

- Control and manage the development of ports

Acknowledging these concerns from the Japanese side and cases of the Laem Chabang port in Thailand, the Vietnamese port officials recognized their limited role over the decision by HCMC to develop Hiep Phuoc and Cat Lai ports. The concern over low berth occupancy ratio was also regarded as due to the impact of the international recession around 2010 and that cargo demand would eventually increase as the world economy recovered. Since the economic growth potential of the south Vietnam was huge and the political system, economic situation, and times were different from those in Thailand.⁵³ Concerns of foreign terminal operators, including those from Japan, were barely understood by Vietnamese stakeholders since the terminal was built in 14 m water depth and 100,000t containerships had already been called at CMTV since 2011. The report analysed the challenges of the southern ports and contained meticulous recommendations and action plans, but there was no feedback from the deputy prime

⁵² The recommendations of the study include requests to HCMC, such as the suspension of the Hiep Phuoc Port development project.

⁵³ Based on interviews of stakeholders in maritime sector.

minister.⁵⁴

(3) Investment promotion activities in the surrounding industrial parks to enhance the use of the port -

Although Ba Ria Vung Tau Province is a target area of the Project, it was not actively discussed with JICA officials from the time of project formation. Since the operation of CMTV port had been sluggish, Ba Ria Vung Tau Province recognized the importance of active use of CMTV port by existing companies and attracting more new investment. Accordingly, they continued to expect substantial support from Japan. In October 2011, the "Joint Statement on Actions under the Strategic Partnership for Peace and Prosperity in Asia" was released, in which Prime Minister Dung mentioned, "I look forward to the development of special industrial parks in the two regions of Hai Phong and Ba Ria-Vung Tau with the cooperation of Japan to promote investment and develop Vietnam's base industries."

In 2012, the "Data Collection and Confirmation Study on the Formation of Growth Axes in North, Central and South Vietnam" by JICA highlighted the Ba Ria Vung Tau Province as a potential growth area in the South. At that meeting with senior officials of Ba Ria Vung Tau Province and JICA, concern was expressed that the number of Japanese companies operating in the province was limited compared to other countries⁵⁵. Subsequent discussions led to the establishment of the Japan Desk in 2014, a support office for Japanese companies funded by Ba Ria Vung Tau Province, with the aim of promoting investment in the province and improving the business environment.⁵⁶

JICA experts from the Southern Investment Promotion Centre of the Foreign Investment Agency also assisted in its establishment⁵⁷. With support and encouragement from JICA and JETRO, the Ba Ria Vung Tau Province appointed one person each from the Investment Planning Department, the Foreign Affairs Department and Commerce, and the Industry Department respectively, as shown in Figure 6, as of 2021.

Since its establishment, Japan Desk has been a platform supporting Japanese companies in setting up their business in Vietnam by providing information on its website, consultations on the needs of individual companies, and seminars on investing in Japan and Vietnam. In December 2014, Phu My 3 Industrial Park was designated as the only special industrial park⁵⁸ in the south. When Japan Desk was launched in 2014, the CMTV port was only a general cargo terminal with limited container cargo handling volume. Once a year, a round table meeting was held between Ba Ria-Vung Tau provincial officials and Japanese companies

⁵⁴ Based on interviews of stakeholders in maritime sector.

⁵⁵ Meeting record of Ba Ria Vung Tau Province and JICA team in November 2012.

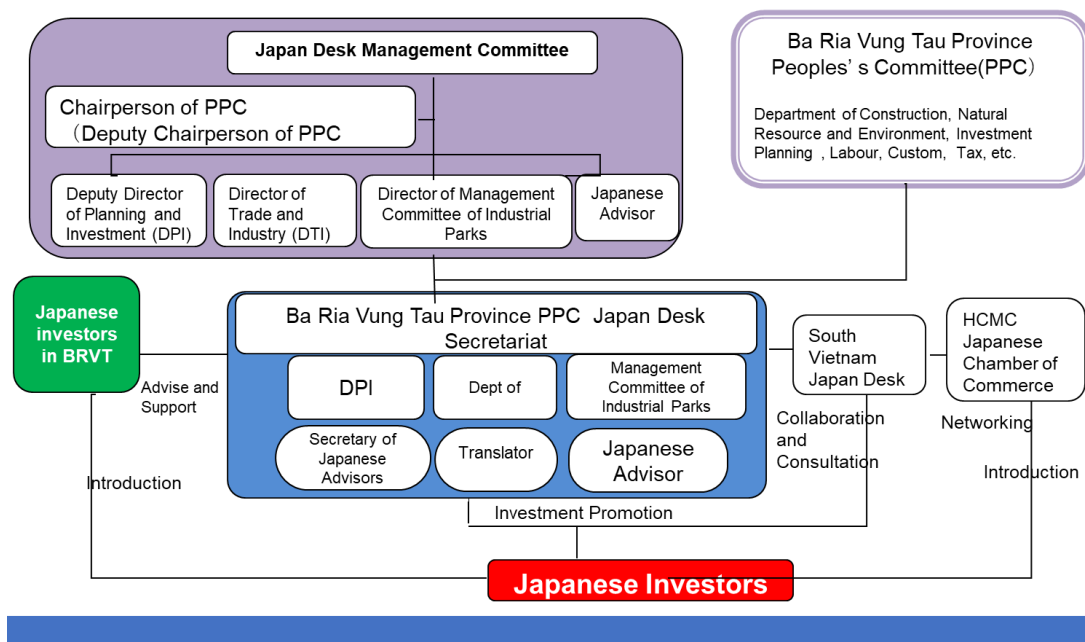
⁵⁶ JICA Press Release. Retrieved June 2021, website:

https://www.jica.go.jp/vietnam/office/information/press/ku57pq000021ivp3-att/201407_01ja.pdf. The signing of a Memorandum of Understanding on investment support between Mizuho Bank, a Vietcombank partner, and the People's Committee of the province was also announced. The decision to set up a Japan Desk in Ba Ria Vung Tau Province follows Haiphong's decision to set up a Japan Desk earlier in May 2012.

⁵⁷ At the Japan Desk, we hired a Japanese language teacher at Vung Tau University as the first foreign civil servant. Vice president of the Phu My 3 Special Industrial Park (from Sojitz), has the goal of making it a modern container terminal like Laem Chabang in Thailand, and actively advises The Province of Ba Ria-Vung Tau, having experience in launching industrial parks in other southern provinces and working in Thailand. In addition, JICA dispatches managers who have experience in Vietnam as consultants.

⁵⁸ Land lease period is expanded to 70 years compared to normal case of 50 year. <http://www.phumy3sip.com/>

to exchange views on industrial issues along with CMTV port operations. The project has been carefully designed to create face-to-face relationships with provincial officials and promote investment. However, only Ba Ria-Vung Tau province participates with the local governments. There continues to be no formal forum for consultation with neighbouring provinces where connectivity improvements are needed with HCMC, for discussing the port demarcation of respective jurisdiction.



Source: Japan Desk, Ba Ria Vung Tau Province

Figure 6 Organisation Structure of Japan Desk in Ba Ria Vung Tau

(4) Support for investment by Japanese logistics companies

The logistics service in the CMTV area was clearly an issue. Therefore, Japanese officials suggested that Shirogane Transport Co. Ltd. (Shirogane Transport), which had a representative office in HCMC, to consider investing in the area for logistics services combined with warehousing. Since regulations on foreign investment in the logistics industry have been significantly relaxed at that time, the interests of both Shirogane and Japanese officials to develop the market in anticipation of the growth of the logistics industry in the south of Vietnam were synchronized. Consequently, Shirogane Transport, with the support of JICA, carried out the "Feasibility Survey for logistics services for the Cai Mep Port activation in Vietnam" (SME and SDGs Business Support Project, 2016). With the support of the Japan Desk, a survey of shippers and other companies was conducted. It was concluded that there was a great deal of business potential. As a result of this study two specific proposals were identified as necessary for further business expansion.

- Development of the Cai Mep Port utilization promotion organisation
- Development of Containers Freight Station (CFS) warehouse - Less than Container Load (LCL) service with an empty container adjustment function

In addition, a series of policies were proposed to the Ba Ria-Vung Tau Province, such as sharing information and promoting cooperation among logistics enterprises, securing land for logistics centres, developing transport infrastructure, and preferential investment policies for logistics. The report contents

were highly appreciated by the provincial government because its leaders had not been given sufficient guidance on what they should do during the development of the CMTV port.

Shirogane Transport got acquainted with a Vietnamese company operating the Phu My 3 Industrial Park, which has been receiving a lot of investment from Japanese companies, through this JICA survey. Thanh Binh Phu My was keen to invest in a logistics facility and was deemed a suitable JV partner. Then, in 2019 the first Japanese logistics warehouse company was opened in Ba Ria-Vung Tau province. The logistics centre (public warehouse) was built in Phu My 3 Industrial Park to benefit Ba Ria Vung Tau enterprises that was used to transport their goods to HCMC for logistics services, such as Cat Lai Port. Furthermore, with the completion of Long Thanh International Airport in Dong Nai Province, highways and the Phuoc An Bridge were likely to materialize, followed by more land container transport. More containerships would call at the port, speeding up and reducing the number of loading and unloading operations and increasing the number of direct pick-ups and deliveries from Cai Mep Port to nearby industrial estates.



Source: Thanh Binh Phu My JSC. (2021)

Warehouse of Vina Japan Shirogane Logistics

Chapter 4 Remarkable achievements

4.1 Industrial development policy support and increasing FDI in the hinterland of CMTV port terminals

(1) Change in policy to transform provincial areas as growth pole

The SFEA, consisting of HCMC and seven surrounding provinces, has a land area of only 6.5% of the total, a population of 16 million or 17% of the total national population, a GDP per capita of about USD5,200 (twice the average for Vietnam), accounts 40% of the total exports, and a 44% of FDI of the national total based on data 2021. In Vietnam, 280 industrial parks operate, half of which are in SFEA, driving the Vietnamese economy.⁵⁹ However, the legal frameworks, cooperation between provinces, and infrastructure have been lagging for many years. The prime minister and deputy prime minister have been given clear instructions for the improvement. With the Long Thanh Airport project for completion by 2025, it was appealed that "the Government and Parliament need to renew their approach."⁶⁰

In October 2015, the Prime Minister approved the "Action Plan for Industrialization,"⁶¹ providing guidelines for industrialization based on provincial cities. In response, JICA began supporting two provinces in North and South Vietnam to realize the industrialization path considering their strengths (Province Based

⁵⁹ Thanh Binh Phu My JSC.

⁶⁰<https://vovworld.vn/ja-JP/%E3%83%98%E3%83%88%E3%83%8A%E3%83%A0%E7%B5%8C%E6%B8%88/%E5%8D%97%E9%83%A8%E3%81%AB%E3%81%8A%E3%81%91%E3%82%8B%E9%87%8D%E7%82%B9%E7%9A%84%E7%B5%8C%E6%B8%88%E5%9C%B0%E5%9F%9F%E3%81%AE%E7%99%BA%E5%B1%95-747702.vov> (Confirmed July 2021, Also interview with Dr. Tran Dinh Thien Vietnam Institute of Economics were conducted.)

⁶¹ Decision1829/QD-TTg

Economic Growth).⁶² Ba Ria Vung Tau Province was selected in the south to conduct the "Data Collection Survey on Ba Ria-Vung Tau Province Environment-Friendly Industrial Accumulation and Logistics Hub Strategy (2018)" in order to develop the necessary industrial policies to realize the industrialization strategy with special features. The recommendation of this study is that Ba Ria-Vung Tau Province should become a leading province in green growth and international logistics hub, which will be a driving force for green growth in the southern economic zone of Vietnam and aim to become an international logistics hub for ASEAN. It is significant that such a roadmap has been used in the planning process of Ba Ria-Vung Tau Province to elaborate the policies to support the CMTV Port and the specific measures to be implemented.

(2) Growth of FDI

The province of Ba Ria-Vung Tau has not been active in FDI for some time since the first Japanese steel plant opened in 1994. However, the CMTV Ports and Ba Ria-Vung Tau's natural gas and other resources, stable supply of electricity, water resources, and other favourable conditions have led to the establishment of 33 Japanese companies in the province as of 2020. The Japanese companies operating there are heavy industry, petrochemicals, basic science, oil, natural gas, LNG, power plants, ports, logistics warehouses, corrugated cardboard, furniture, and food processing, etc. (See Figure7).

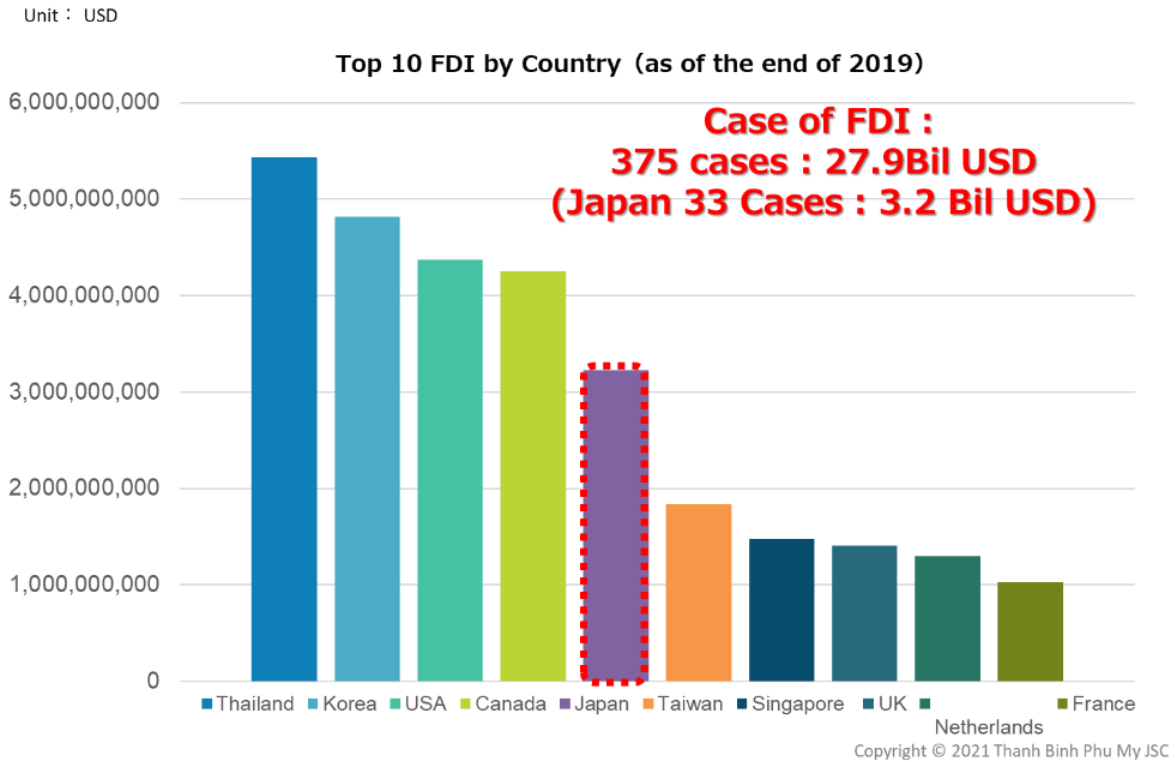
By the end of 2019, there have been approximately 375 foreign direct investments from 30 countries worldwide. Thailand has invested in the Long Son Petrochemical Project (about USD5.4 billion) to be operational in 2023 and South Korea in the Hyo Sung Petrochemical Project (about USD 1.2 billion) operational in 2020). Accordingly, Vietnam will be able to produce basic petrochemicals in the south. Consequently, in a few years, the supply chain in Southern Vietnam has improved rapidly (see Figure 8). In other words, it gradually became possible to produce materials in the Ba Ria-Vung Tau Province and supply them to nearby light industrial zones. Traditionally, local procurement rate⁶³ of Vietnam for raw materials and components has been very low compared to neighbouring China, Thailand, India, Indonesia, and Malaysia. In 2010 it was merely in the 20% range, but in the 2020s, it has risen to around 37%, putting it on par with Malaysia.

There is no doubt that the location of the CMTV port complex was a decisive factor behind these FDI decisions. The cargo at the container terminals of CMTV ports originating from Ba Ria-Vung Tau Province has been less than 5%,⁶⁴ but subsequently, it is expected that the share of cargo originating from within the province will increase

⁶² JICA Vietnam Office News(June 2016)

⁶³ https://www.jetro.go.jp/ext_images/_Reports/01/b5dea9948c30e474/20200017.pdf Accessed in July 2021)

⁶⁴ Interview from Ba Ria Vung Tau Province.



Heavy Industry

- OKAYA & CO., LTD.
- KYOEI STEEL CO., LTD.
- NIPPON STEEL CO., LTD.
- NSG Group CO., LTD.
- Yamato Kogyo CO., Ltd

Petrochemicals and basic chemistry

- AGC CO., LTD
- ARAKAWA CHEMICAL INDUSTRIES CO., LTD**
- AIR WATER INC. TD
- SEIKO PMC CORPORATION**
- DAIICHI KIGENSO KAGAKU KOGYO**
- NIPPON SANJO HOLDINGS CORPORATION**

Port-Warehouse

- KYOEI STEEL CO., LTD. TATSUMI SHOKAI, CO., LTD. JOIN (a Japanese government-private sponsored infrastructure investment fund company)
- SHIROGANE TRANSPORT**
- Mitsui O.S.K. Lines CO., LTD.

Oil, natural gas, LNG and power stations

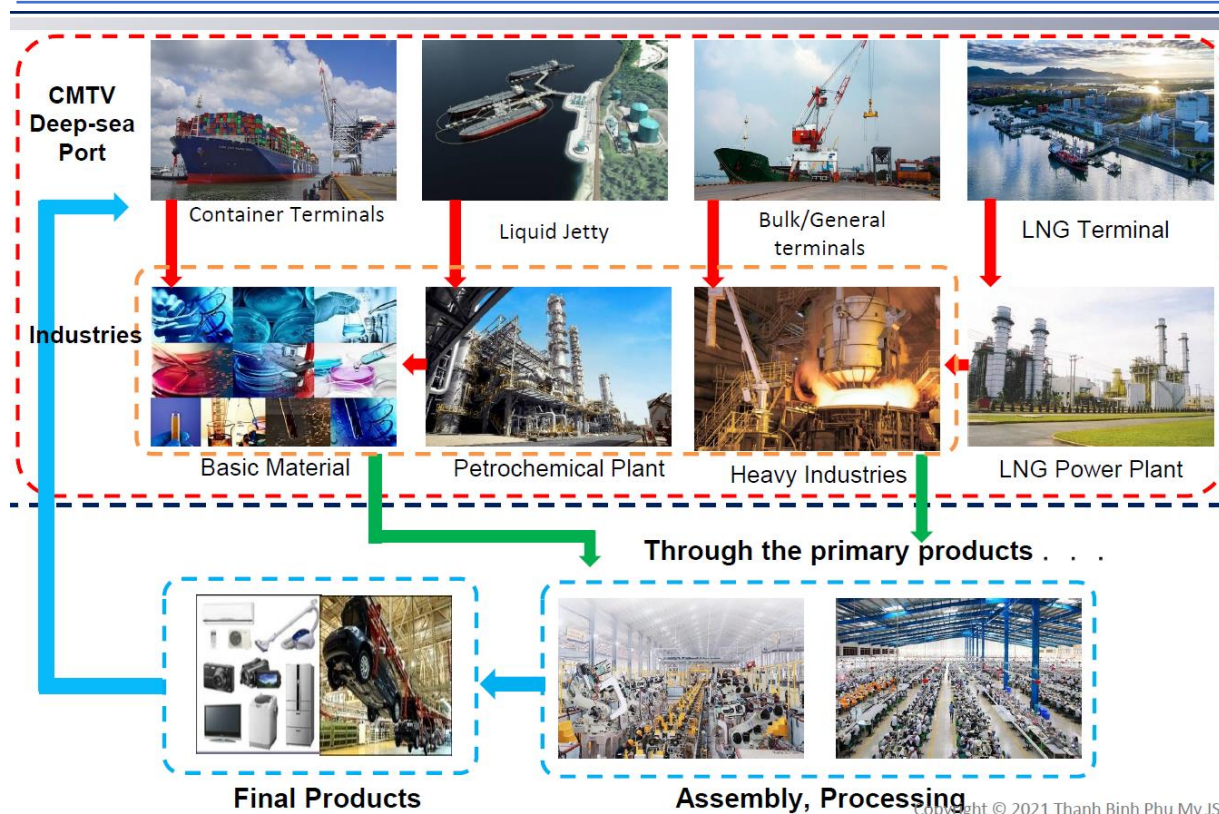
- JX Nippon Oil & Gas Exploration Co., Ltd
- TOKYO GAS CO., LTD
- OSAKA GAS CO., LTD**
- TOKYO ELECTRIC POWER COMPANY HOLDINGS, INCORPORATED
- KYUSHU ELECTRIC POWER COMPANY, INCORPORATED
- SUMITOMO CORPORATION
- SOJITZ CORPORATION**

Other Manufacture

- LIXIL GROUP
- NITORI HD**
- TOAMI CO., LTD
- MARUBENI CORPORATION**
- YOSHINO GYPSUM CO., LTD**
- SHOWA DENKO CO., LTD.
- IZUMI CHAIN MFG. CO., LTD**
- OG CORPORATIONCO., LTD**

- Source: : Thanh Binh Phu My JSC.(2021)

Figure 7 FDI in Ba Ria Vung Tau Province and Investment from Japanese Companies



Source: Thanh Binh Phu My JSC, 2021.

Figure 8 Supply Chain in South of Vietnam

4.2 Cai Mep Port taking a leap forward with larger vessels – targeting to be an international logistics hub

(1) Increasing congestion in Cat Lai Port

Capacity utilisation at the Cat Lai Port was above 80% even before the opening of CMTV's TCTT terminal (funded by the project) opened in 2014. In recent years, the volume of containers and cargo held at the Cat Lai Port has always been at full capacity, especially for the receipt of imports. In 2017, the MOT decided not to build new berths, that only vessels with a deadweight of 30,000 t or less would be allowed to call at the port, and that the Hiep Phuoc port area would become a general cargo port in the future, with a maximum deadweight of 50,000 t for container ships.⁶⁵

(2) Start of collection of special port fees in HCMC

The Cat Lai Port has been experiencing a rapid increase in the amount of stagnant cargo. Although the capacity of the terminal can be increased by successive expansions, solving the congestion on the access roads is not easy. The intersection in front of the port is a roundabout, but there is significant congestion in all directions that causes significant air pollution.⁶⁶ It has also negatively affected roadside

⁶⁵ Decision 3655/QĐ-BGTVT dated February 27, 2017.

⁶⁶ There have been studies of the causal relationship between the port and air pollution at Saigon Port, which have shown limited evidence of the impact of port air pollution on nearby residents and workers. (Interview with Dr. Bang Q. Ho Institute for Environment and Resources (IER) / Vietnam National University in HCMC).

development and residential land development. Analysis of traffic congestion in the vicinity of ports, including the port of Cat Lai, shows that there is a need for further road development in HCMC. However, the city has a policy of funding about half of its transport needs for the 2021–2030 period from municipal coffers, with the remainder covered by the central government, ODA, and private funding. In reality, however, only about 25% of the city's share of the budget is reserved and there is no external funding available, leaving the city in a critical situation.

Therefore, the Department of Transport of HCMC has decided to ask the municipal People's Committee to collect fees for use of public seaport infrastructure and utilities in sea border-gate areas within the territory of Ho Chi Minh city (in short, special port fees) from businesses using Ho Chi Minh City's ports for the purpose of upgrading port infrastructure.⁶⁷ The HCMC's port throughput is increasing by 5% per year, with an average of around 26,000 vehicles using the port on a daily basis. If this special port fees is imposed, it will lead to higher haulage costs for many companies. As shown in Figure 8, many industrial parks are close to the Cat Lai port and only eight industrial parks are located in Ba Ria-Vung Tau province. Considering the distance, cost-sensitive shippers in Dong Nai and Ba Ria-Vung Tau provinces may choose the Cai Mep Port over Ports in HCMC as shown in Table 7 , in order to reduce their costs, thereby increase their use⁶⁸.

Table 7 Cost comparison for transporting two ports from respective industrial parks after applying the special port fees

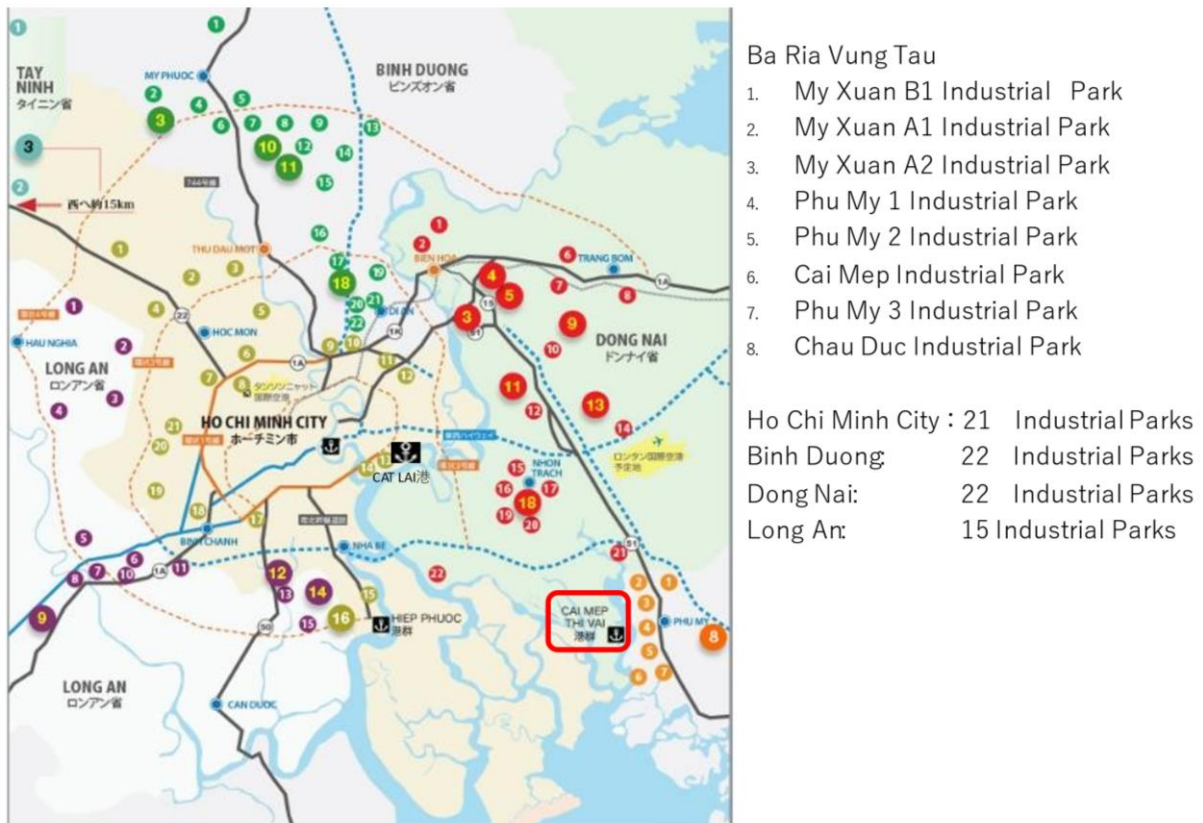
(The expected cost of transferring a 20' feet container with normal temperature, including newly applicable infrastructure users fee)

Industrial Parks(Province)	For Cat Lai Port		For Cai Mep Port		Gap of the cost of two ports(USD)
	Distance	Cost (USD)	Distance	Cost (USD)	
Tan Thuan EPZ (HCMC)	13 Km	78	65 Km	196	118
VSIP 1(Binh Duong)	26 Km	161	78 Km	196	35
AMATA (Dong Nai)	35 Km	161	65 Km	174	13
Nhon Trach (Dong Nai)	45 Km	165	40 Km	157	-8
Phu MY 3 (Ba Ria Vung Tau)	75 Km	196	10 Km	91	-105

Source: Konoike transport

⁶⁷ Department of Transport expects to collect about VND241 million per month, including about \$100 per 20-ft container and about \$2 per tonne for liquid bulk (based on HCMC data). The planned levy has been postponed until 2022 due to strong opposition from users.

⁶⁸ Interview from Japanese companies.



Source: Prepared by the information source, such as JETRO.

Figure 9 Map of Industrial parks in southern Vietnam

(3) Improved Environment surrounding the CMTV Port

Procuring containers have been a serious problem since CMTV Port opened; however, this is gradually changing as some shippers are using CMTVs for imports as well as exports to avoid empty containers. In addition, Ba Ria-Vung Tau Province has been supporting the logistics service (Figure 6), and a wider lane road has been built in the Cai Mep Port area to improve the convenience. However, in order to become a regional hub port in South East Asia, the customs system is still complicated and some officials make opaque demands due to conflicts of interest. The volume of cargo handled in Cambodia is still less than 10% of the total, and while the country is trying to become a transshipment⁶⁹ port, it is still far behind international port management such as its neighbours Malaysia, Thailand and Singapore⁷⁰.

(4) Towards an international logistics hub after a period of stagnation and rapid growth

1) General cargo terminal

The TVGP (J in Figure 1, under the project) opened in 2014 as a JV among five companies. The volume of cargo it handles has increased from 1.3 million t in 2014 to 9 million t in 2020, far exceeding the target. Furthermore, additional investment has been made in warehouses and other necessary facilities to cope

⁶⁹The transshipment of cargo from one ship to another at a port where the ship (aircraft) has called. The transshipment of unloaded cargo to another vessel (or aircraft) at the port (airport) where the vessel (or aircraft) has called, for transportation to another port (airport). Sankyo website: <https://search.yahoo.co.jp/>

⁷⁰ Interview from Japanese companies

with the increasing volume of cargo handled.⁷¹ In addition, several steel manufacturers, including a subsidiary of Kyoei Steel, established operations in the Thi Vai area in the 1990s and were granted a license to develop a 41-ha port in 1997. But the approval for the port took time, and there was no general cargo port to mainly handle steel. In 2015, a joint project to develop and operate a port in Vietnam was approved by Kyoei Steel and Tatsumi Shokai, a port transport company with investment and debt guarantee from JOIN. Thi Vai International Port (TVP), which solely handles steel scrap that is a raw material for Vina Kyoei Steel (which operates in Phu My Industrial Park), and products of nearby steelmakers started operations in 2018 (M in Figure 1).⁷²

2) Container Terminal

As shown in Figure 8, the CMTV port has been growing at an annual rate of 17-36% since 2014, which is significantly higher than the growth rate of the Cat Lai Port (0–18%) over the same period. The CMTV terminals handled less than a total of 1 mil TEU of cargo until 2013, but since the opening of the new terminals in 2014, the total cargo handled by the four terminals has increased from approximately 1.14 to 4.41 mil TEU by 2020.

The SNP operates several terminals in addition to Cat Lai, which handles the largest containers in the south, and is involved in the operation of three terminals in CMTV (TCCT, TCIT, and TCTT). As shown in Figure 9, the rate of growth in the volume of cargo handled by the Cai Mep port between 2011 and 2020 has doubled more than in Cat Lai Port. By 2021, 24 liner services per week are available at the CMTV port (all terminals combined), with North American, European, and intra-Asian vessels calling the port, while 81 liner services are available per week in Cat Lai Port.

Having operated TCIT, SNP (in which MOL has an equity stake) coordinated port arrivals, thereby increasing cargo at the TCTT terminal built under the Project. The allocation of cargo to CMTVs by SNP to avoid congestion in HCMC was also thought to have contributed to the increase in the volume of cargo handled by the TCTTs. Although the TCTT only operated at 10% capacity in the first year, the volume handled in 2020 was almost twice that in 2017,⁷³ as shown in Figure 8.

Furthermore, the contribution of the CMTV port terminals is remarkable since the national container throughput grew by double between 2014 and 2019 (see Figure 11). In the future, the logistics infrastructure is expected to expand further as an industrial base growing at a GDP growth rate of approximately 6.5% (forecast by the International Monetary Fund). Regarding the impact of COVID-19 on the container throughput, it is rather accelerating, partly due to the expansion of the global EC business as well as the economic friction between the US and China.

⁷¹ The TVGP became operational in March 2014 and has already reached 1.3 million t per year by then, far exceeding the target of 780,000 t per year only two years after completion (Ex-Post Evaluation of the year 2018).

⁷²The loan for the wharf development and operation project was co-financed by the Japan Bank for International Cooperation (JBIC), Sumitomo Mitsui Banking Corporation (SMBC), and Resona Bank, with a total amount of USD15 million.

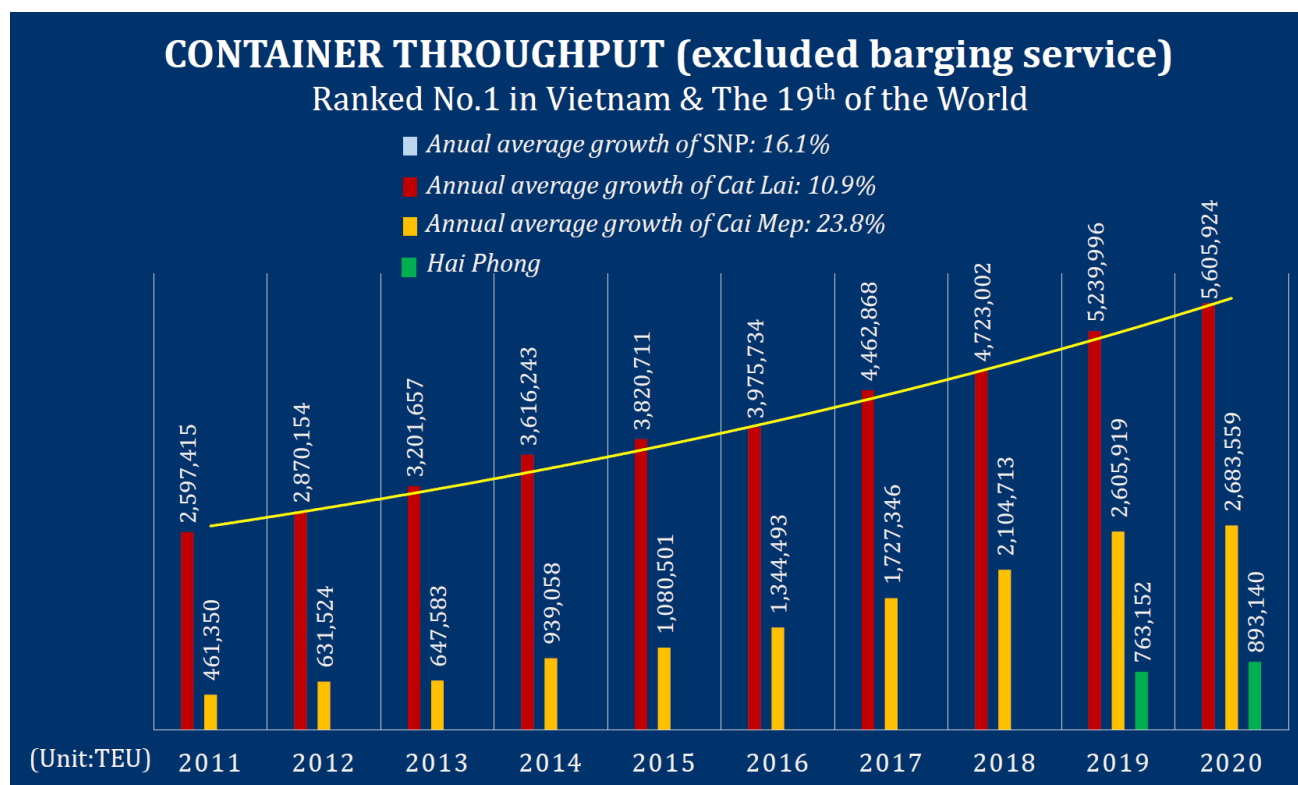
⁷³ The project's target for the volume handled at the Cai Mep container terminal was 360,000 TEU in 2017, but the target was achieved with 380,000 TEU in 2017

Table 8 Trends of Container Throughput of CMTV and HCMC

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1 SITV	21,276	45,534	682	-	-	-	-	-	-	-	-
2 SP-PSA	154,619	255,322	6,041	-	-	-	-	-	-	-	-
3 TCCT	299,363	194,654	86,240	1,647	823	-	-	-	-	-	-
4 TCIT		275,218	543,548	644,354	922,885	979,221	1,112,279	1,324,348	1,632,290	1,957,083	2,089,555
5 CMIT		87,948	306,247	325,054	198,991	387,046	651,537	724,803	792,209	907,374	1,026,840
6 TCTT(ODA)					15,350	99,576	224,609	389,419	470,704	648,835	741,415
7 SSIT								51,177		229,092	553,989
Total Cai Mep Thi Vai	475,258	858,676	942,758	971,055	1,138,049	1,465,843	1,988,425	2,438,570	2,946,380	3,742,384	4,411,799
8 Cat Lai +Hiep Phuoc	2,850,000	2,597,684	2,956,550	3,255,000	3,827,115	3,817,971	4,037,257	4,462,868	4,721,277	5,245,061	5,821,016
9 Saigon	401,982	308,937	311,892	283,199	345,147	325,112	273,244	320,523	171,730	163,221	
10 Ben Nghe	210,549	154,573	139,654	109,496	148,306	178,548	184,712	276,280	313,895	341,835	
11 VICT	297,561	374,248	349,290	437,717	583,693	631,331	633,615	561,445	579,786	522,715	
12 Lotus	4,498	56,543	54,976	68,987	84,900	56,408	58,406	28,437	30,216	22,373	
13 SPCT	95,934	139,772	224,139	251,035	301,382	242,369	152,073	31,163			
14 Tan Cang Hiep Phuoc						135,627	218,969	80,211	156,743	191,990	277,325
Total HCMC+ Dong Nai						5,882,292	5,887,593	6,155,535	6,590,754	7,531,054	6,753,683
Total South	4,290,088	4,533,608	5,187,789	5,956,802	7,043,070	7,779,398	7,944,828	8,668,431	9,610,321	11,362,649	

Source: Vietnam Seaports Association (VPA), Tan Cang–Cai Mep International Terminal (TCIT)

Note: Terminals 1–7 in CMTV Port, Terminal 8 in Cat Lai Port operated by SNP, Terminals 9–12 in inner city terminals of HCMC, and Terminals 13 and 14 in Hiep Phuoc Port, of which SNP operates Terminal 14. Total South includes port handling volumes in the Mekong Delta.



Source: SNP Presentation, March 2021.

Figure 10 Container throughput of SNP



Figure 11 Container throughput of Vietnam

(5) Towards the establishment of the largest terminal in the world

CMTV Port has a depth of -14 m, which allows Panamax type vessels with a deadweight of 70,000 t to call at the port at any time, but in October 2020, the world's largest container ship, Margrethe Maersk, docked at CMIT in the CMTV Port. It is 399 m long and has a deadweight of 214,000 t. In 2021, the Gemalink terminal invested by GEMADEPT, a 1,500 m-long berth with a deadweight capacity of 200,000t, was inaugurated in Figure 1 at the mouth of the Thi Vai River, at position "B" of the CMTV port terminal area⁷⁴. The terminal is 1,500m long and can accommodate cargo ships with a deadweight capacity of as large as 200,000t.

The construction plan has been underway target to increase the annual cargo throughput to 2.4 million TEU, making it the largest deep-sea port in the country once constructed. GEMADEPT had halted work at the CMTV port terminals prior to 2010 due to low utilisation but has resumed work in response to increased container cargo handling. In addition, a priority project of MOT is the dredging of the navigation channel down to -15.5m in order to create a permanent environment for vessels of 200,000t capacity.⁷⁵. There are also plans for the Cai Mep Ha Container Terminal and Logistics Park at the southern end of CMTV

⁷⁴ JOIN, Sumitomo Corporation

⁷⁵ JICA The Comprehensive Study on The Sustainable Development of Transport System In Vietnam (VITRANSS 3) (2021)

As for the railway line to the CMTV port mentioned in the report, a survey conducted by JR Freight a few years ago showed that it could not attract enough cargo and passengers to operate a regular service. Thus, it is important to continue to improve domestic water transport (interviews with Japanese companies and VINAMARINE).

(Figure 1, marked A). Given the rapid increase in capacity utilisation of the CMTV port complex, the construction of a new terminal is a necessary project which will be decided by investors in the near future.



Chapter 5 Lessons learned

In order to sustain the outcome and impact of the project, it is important to build a consensus that goes beyond the discussions with the MOT and other stakeholders. However, the project can still be initiated even if these are not fully met, but problems will continue to be unresolved during and after the project. For this reason, it is important that the desired direction and its specific requirements are in place and that both Japan and Vietnam work towards a solution, even after the project implementation. The followings summarise some of the challenges identified in developing a large port infrastructure through this process analysis. While recognizing these issues, the following five lessons have been identified:

- (i) the importance of breakthroughs for the construction of new deep-water ports by supporting the development of upstream plans;
- (ii) difficulties in building consensus among stakeholders in a complex port sector;
- (iii) coordination among private terminal operators, port users, and government agencies;
- (iv) the need for improved connectivity along with the port development
- (v) strengthening cooperation between port developers and local governments where ports are; located and;
- (vi) the importance of investment promotion activities.

(1) Importance of breakthrough to build a new deep seaport based on the upstream comprehensive master plan ⁷⁶

In the 2000s, the Vietnamese port sector officials faced difficulties making a breakthrough in constructing a new deep-sea port in the CMTV area of Ba Ria-Vung Tau Province during the coordination and building a consensus among various stakeholders of port sector of HCMC. Based on the future demand

⁷⁶Project Design, Human Resource & Organizational capacity (Skill Transfer) are applied in Delivery Challenges under GDI.

forecast and the significance of a deep-sea port. Japanese technical assistance was provided in formulating a master plan for the entire southern part of Vietnam. It illustrated concerns about the limitations of the inner-city port terminals of HCMC as well as the development of new terminals, such as Hiep Phuoc. It was also confirmed, technically, that the CMTV area, particularly the Cai Mep area at the mouth of the river where sufficient hinterland is available, is suitable for developing a deep-water port. The F/S was then carried out to step forward the prospects of materialization of the CMTV port.

The decision on the ODA loan project, including the dredging of the shipping channel, to materialize CMTV port terminals, as indicated in the Master Plan, resulted in a series of subsequent investments by terminal operators around the world. Port privatisation, full-scale environmental and social considerations, and the technical guidance for soft ground improvement techniques were also provided. Significantly, upstream level planning, namely master plan played a game-changing role in creating the first group of terminals in Vietnam capable of hosting full-scale large vessels. The technical assistance, facilities development, operational management, and policy support to promote industrial clusters that Japan brought are highly significant.

(2) Difficulties in building consensus among stakeholders in a complex port sector⁷⁷

The stakeholders of the ports in Vietnam are not only the MOT but also the local governments directly operating the ports and the relevant ministries (the Ministry of Agriculture if the terminal is for agriculture and the Ministry of Industry if the terminal is for industrial resources).

Furthermore, the largest terminal operator in southern Vietnam is SNP (a company under the MOD), and SP (a VINELINES company in HCMC) also operated a terminal (VINELINES is also an operator under the MOT but was having financial difficulties). The project stakeholders were not able to communicate with SNP, which has a huge influence on the port business in Southern Vietnam. JICA recommended to the deputy prime minister, instead of the MOT, a policy limiting the development of Hiep Phuoc Port in 2013 and creating incentives to direct cargo from Cat Lai Port to Cai Mep Port,⁷⁸ but there was no feedback on this.

The message of Japan about upgrading the business environment at Cai Mep Port to become a regional hub port was essential for further growth of the southern economy and thus for the competitiveness of Vietnam was not thoroughly acknowledged by anyone other than those involved in VINAMARINE and MOT. Reaching a consensus among Vietnamese officials to become the largest international gateway port for the key economic region of southern Vietnam has not been easy. There were limits to the Japanese side to lead a consensus-building among Vietnamese officials.

Since then, the CMTV port has seen an increase in the number of large vessels, owing to the availability of deep-water ports, and has been used by some of the largest ships in the world, such as A.P. Moller-Maersk's (Danish shipping company) Margrethe (214,121 DWT, 400 m long, 60 m wide) and COSCO's

⁷⁷ Coordination, Engagement (Roles & Responsibilities), Legislation & Regulations, Governance & Politics are applied in Delivery Challenges under GDI.

⁷⁸ JICA. A Study on the Current Situation of Ports and Strategies for Optimized Container Port Operation in Southern Vietnam (2013).

Aquarius (197,049 DWT, 400 m in length, and 60 m in width). The largest ships in the world have also called at the port, contributing to the increase in imports and exports. For example, even with the COVID-19 pandemic, the volume of cargo has increased by 18% compared to 2019⁷⁹. In addition, the pending road project has been progressing, which will reduce congestion in HCMC and Dong Nai and Binh Duong provinces and increase awareness of the advantages of CMTV Port.

At the 13th Communist Party Congress in 2021,⁸⁰ the highest policy-making body in the country declared that CMTV Port should aim to become a transshipment terminal, a step-up from a gateway port. Since JICA prepared the master plan in 2002, the MOT has been making policy recommendations that CMTV should become a hub port. Although it was understood at an early stage that coordination should be beyond the MOT, it was difficult to make continuous efforts. Thankfully, with the efforts of those involved and the rapid growth in cargo demand, the proposal finally came to fruition.

(3) Coordination between private terminal operators, users of the port, and government agencies⁸¹

The commencement of the project led to the entry of several foreign private operators into the CMTV area. However, as many operators approached Ba Ria-Vung Tau Province to secure terminal sites simultaneously, the sites were fragmented, and each terminal of the private operator was not large enough to accommodate large vessels with a berth length of over 400 m. The terminal built for this project also has two 300-m berths. It is necessary to verify whether the dialogue between the Vietnamese government and the private companies who requested to expand their business by considering the port call of large vessels was sufficient and appropriate.

Clearly, predicting the increase in the size of container ships was difficult, and there was little room for flexible terminal planning as other private companies decided to invest on both sides of the container terminal developed by the Project. The MOT, as the project counterpart, has no authority to approve a terminal development project in the form of a port manager. There have been many difficulties in the efforts of those involved in the project, including the need for coordination beyond the MOT. Although MOT is the project executive agency, it does not have comprehensive authority from planning to licensing ports in the form of a port authority. In particular, the fact that many terminals start operating at the same time increased severe competition, as they discount each other's port charges, which affects the maritime business and the government. Before approving the establishment of a new port, it is essential that the existing ports are fully coordinated. The MOT, the Government Office, HCMC, and the surrounding provinces that would be the users of the project needs to coordinate and reach consensus at an early stage for achieving a more competitive port.

⁷⁹ Approximately 25% increase in the first 8 months of 2021 was confirmed compared to the previous year based on unofficial sources (VINAMARINE).

⁸⁰ Documents of the 13th Communist Party Congress, Vol. 1, Socio-Economic Development Strategies for 2021.

⁸¹ Coordination, Engagement (Roles & Responsibilities), Legislation & Regulations, are applied in Delivery Challenges under GDI.

(4) The need for improved connectivity along with the port development⁸²

The Phuoc An Bridge, which will significantly improve access from the CMTV port to Ho Chi Minh City, and the Bien Hoa - Vung Tau Expressway, which can alleviate congestion on the existing Highway 51, were also considered for Japanese assistance but did not materialise as of 2021. It is difficult to analyse the economic loss due to delays in the development of the port-related road infrastructure, but the bottleneck has not been overcome for almost 10 years since the port was completed despite repeated requests from industry. The Japanese side should have prioritised their support and committed to a plan with the MOT to develop the port without delays in road infrastructure.

(5) Strengthening co-operation between port developers and local governments where ports are located⁸³

The project provided policy-making support to the VINAMARINE since the upstream development study and achieved the capacity building of the concerned parties through detailed design, construction of facilities, and technical cooperation. However, during the implementation of the project, the outreach of JICA to Ba Ria-Vung Tau Province, where the port is, was limited. In the meantime, after the completion of the project in 2014, JICA assisted in setting up the Japan Desk.⁸⁴ It supports an F/S to encourage private sector investment, promotes investment in the hinterland of the port, and also provides specific advice on policies to improve services that are lacking in the face of increasing cargo, which created various policies in Ba Ria Vung Tau Province. In order to improve the difference in logistics services between HCMC's Cat Lai Port and CMTV Port, land is being reserved to actively enable the attraction of logistics service companies and to provide a consistent set of related procedures and services that had been dispersed to several locations and responsibilities. These suggest the importance of starting to build cooperative relationships with local governments at the project location at an early stage.

(6) Importance of investment promotion activities⁸⁵

Phu My 3 Industrial Park in Ba Ria Vung Tau Province is strategically located only 2 km from CMTV port and is the only designated special industrial park by the Vietnamese government in the south. It has Japanese capital participation and is equipped with the infrastructure of international standards. Focusing on attracting investment in the park, the Japan Desk has continued promoting private investment around the CMTV port. The number of Japanese companies moving into the area is rising, suggesting the need to develop the infrastructure of the port, and at the same time, engage in a robust dialogue with the private

⁸² Commitment Leadership, Coordination, Engagement (Roles & Responsibilities) are applied in Delivery Challenges under GDI.

⁸³ Business Environment, Commitment Leadership, Coordination, Engagement (Roles & Responsibilities) are applied in Delivery Challenges under GDI.

⁸⁴ https://www.jica.go.jp/vietnam/office/information/press/ku57pq000021ivp3-att/201407_01ja.pdf Accessed in July 2021)

⁸⁵ Business Environment, Commitment Leadership, Coordination, Engagement (Roles & Responsibilities) is applied in Delivery Challenges under GDI.

sector, including shipping companies, manufacturers, and other shippers using the port.

After the project was put into service, the Japan Desk encouraged the private sector to hold regular roundtables for consultation with the Ba Ria-Vung Tau provincial government. Establishing a mechanism to coordinate issues is highly appreciated since the port, being a highly public infrastructure, cannot efficiently operate and increase occupancy without the cooperation of the public and private sectors.

Chapter 6 Challenges ahead

In recent years, the number of large vessels calling at the CMTV Port terminals that connect to the huge markets of Europe and the United States has been steadily increasing in, and gradually the image of Cai Mep as the hub port in the south is being shared by the business community. Efforts to harness a consensus among all relevant organizations to strengthen the Cai Mep Port to become a regional hub port are contentiously necessary.

Needless to reiterate the significance of the starting with the Master Plan, breaking through the difficulties of developing a large scale port outside of Ho Chi Minh City and continuing to support the project, However, there are no signs that the difficulties of coordination between the then VINAMARINE, MOT, Ho Chi Minh City, the MOD and the private sector are being resolved, as evidenced by the fact that the establishment of a port authority is not yet a reality, even though it is enshrined in the Maritime Law (2015). It is said that the authority of the Ministry of Transport is not enough to resolve the discrepancies in the various laws and regulations, and thus, continuous efforts to enhance the competitiveness of Vietnam's ports are necessary.

In the ASEAN region, there are hub ports with large berths and modern facilities in Singapore, Malaysia, and Thailand. In the past, Vietnamese ports were merely feeder ports for cargo transshipment to these hubs. They can direct cargo to European and US routes without transshipment, which increases their competitiveness. However, the concern for the private sector is that the Vietnamese side will try to undermine this competitiveness by expanding the existing inner-city ports than the CMTV Port or developing new ports that will affect the volume handled by CMTV Port. Continuing the discussions between Japan and Vietnam on sharing the functions with the surrounding provinces where the ports are and policy support for the preparation of master plans are important.

The impact of this project is not limited to the province of Ba Ria-Vung Tau but also others to improve connectivity, specifically the development of cross-provincial roads and inland water transport, and to clarify the role of ports in other provinces, such as HCMC. There is a need to discuss and reach a consensus on the direction of development in the surrounding provinces. The current CMTV Port does not receive any third country cargo except from Cambodia, which is only about 10% of the total cargo. Plan for actions needs to be confirmed for relocating the port terminals located in city centre of HCMC complying with the plan, attracting more cargo to the CMTV port terminals, mitigating traffic congestion and improving connectivity, and services around the CMTV port terminals. Thus, it is necessary to identify specific roadmap for the MOT, provincial governments in the SFEA, the MOT and other stakeholders must be identified to work towards the same mission.

Chapter 7 Way forward

Since around 2010, a series of terminals have been opened in the CMTV region, but initially they did not attract enough container cargo and the assumed inner-city port terminals of HCMC have not been relocated. The project has long been a source of concern for Japanese officials due to the low initial utilisation rate of the container terminal, but the counterpart, VINAMARINE (MOT) has never had the slightest doubt about the success of the project. The global economic crisis of 2008 meant that the real GDP growth rate of more than 7% for the period 2001–2010 was unattainable, but it was still around 6% for 2011–2020. This is because CMTVs have contributed and achieved enough to keep pace with the congestion in the ports of HCMC and the increasing demand for cargo, as industrial development and cargo demand have progressed accordingly.

During the implementation of the Project, there has been a series of new terminal developments and expansions in the neighbouring areas, affecting the handling volume of CMTV Port. The Japanese side has complained that it would affect the cargo collection of CMTV Port and reduce its competitiveness, but this complaint was not heeded. However, the overall utilisation of CMTV Port's multiple terminals, including those built under the ODA project, has increased significantly, and the anticipated increase in cargo volumes has already reached a level where the construction of a new terminal at CMTV Port is required.

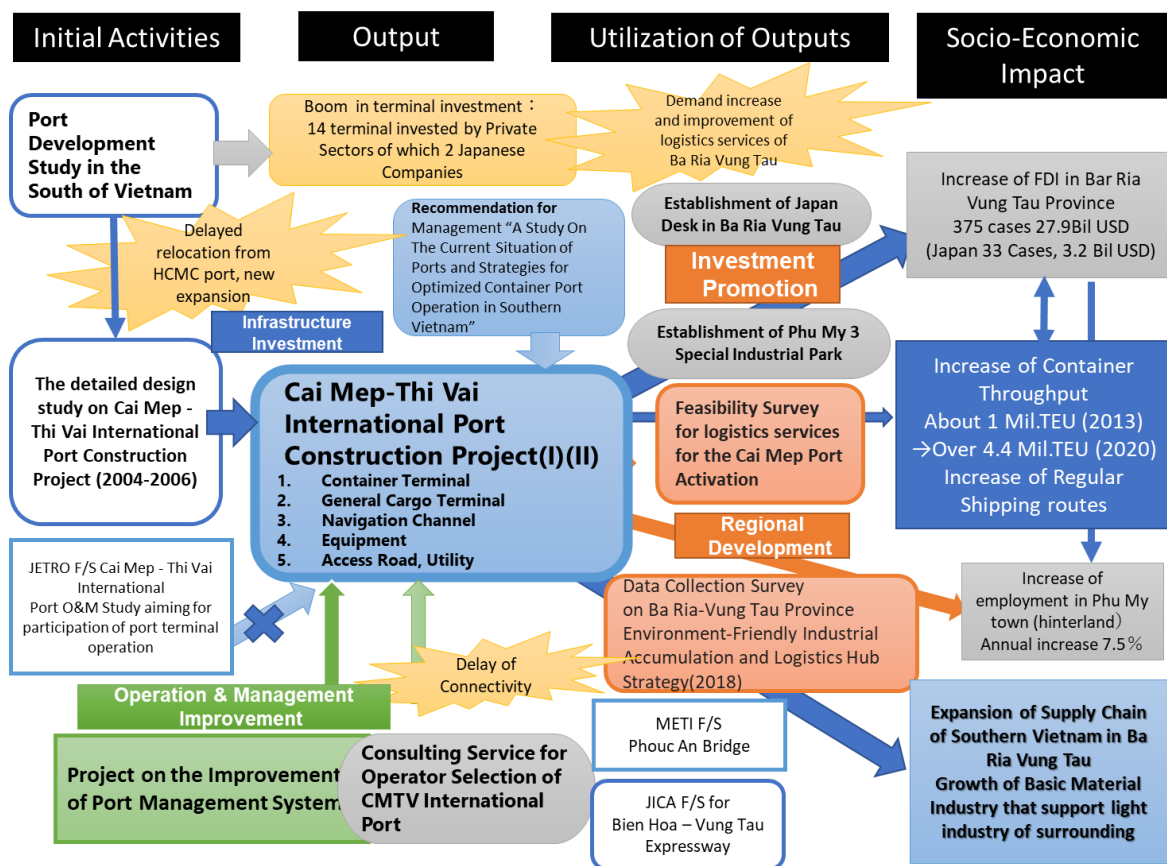
The success of the project was mostly due to the solid industrial development, but the breakthrough was by implementing the Southern Port Development Master Plan Study by JICA. It is the feasibility of the site for a large water depth terminal. Japan had previously supported large ports in the north and central regions of the country and MOT had confidence in Japan. It was, therefore, possible to verify that CMTV was technically suitable. In addition, Ba Ria-Vung Tau Province, which is the hinterland of the port, has begun improving port services and roads near the port and continues promoting industrial investment. Around 2020, the CMTV area resumed its plans to build new terminals, and the total terminal capacity of CMTV reached 6 million TEUs.

One of the factors for reflection is, initially, the Japanese cooperation focused on the technical aspects and not enough on the importance of developing a deep-water terminal through consensus building in Vietnam and encouraging it, i.e., not enough focus on the implementation system of the project and institutional bottlenecks in the port sector. This was due to the terminal operators in Southern Vietnam, including HCMC, being state-owned enterprises under the MOT, the MOD, and HCMC. They perceive the project in three different ways. It was difficult to find a common understanding of the challenges that prevented the development of CMTVs among the multiple stakeholders involved in the port, including the MOT, the MOD, and the provinces in the south, including HCMC beyond Ba Ria-Vung Tau.

The vision to build the largest deep-water terminal in Vietnam and become a transshipment port (hub port for international liners) was first mentioned at the Communist Party Conference in 2021. The importance of CMTV development as a national policy is finally being announced. Accordingly, it is hoped that the highway connecting HCMC and CMTV, which is lagging, and the bridge construction, which has been a bottleneck on the Bay Road, will progress and further improve the convenience of CMTV quickly.

However, despite developing and expanding other port terminals in the vicinity of the Project, as shown in Figure 13, investment promotion, regional development, and improved connectivity were lobbied after the completion of the project to utilize the results until Japanese and Vietnamese stakeholders have continued to promote the importance of the Project until the end. Efforts to eliminate institutional bottlenecks must continue to the future.

The conditions for Cai Mep Port to be suitable for a large container terminal were better in many ways than in the other sites, and it was clear that the hinterland was suitable for the development of large industries, including the materials industry. The difficulties, were gradually overcome by the stakeholders through additional study and supportive policies. The project has laid the foundation to support the supply chain in the South of Vietnam, and drive the economic growth of the whole country through increasing cargo handling volume in the entire south, increasing FDI, and the urbanizing of Phu My Town in the hinterland. It is a typical example of how challenging it is to implement a rational development in technical and economic terms in the absence of a unified policy and legal system surrounding the stakeholders in the sector.



• Source: Drafted by the author

Figure 13 Theory of Change of the Project: How Each Components Interconnect with Each Other

Annex

1. Project Profile

Output	
1. Civil Works and Procurement	
Package 1(Cai Mep Container Terminal)	
Terminal yards	Reclamation Area 37.8 ha
Berth	15m depth ×300m×2, Basin dredging volume 116,565m ³
Utilities	(Inside terminal)Water and power supply, Drainage and sewerage, Yard lighting, Fencing, and Firefighting facility
Building and pavements	(Outside terminal) Office, Amenity Block, Maintenance shop Yard pavement area 317,000 m ²
Package 2(Thi Vai General Cargo Terminal)	
Terminal yards	Reclamation Area 6 ha
Berth	14m depth ×300m×2 Basin dredging volume 165,756 m ³
Access roads	New Road 800 m
Utilities	(Inside terminal)Water and power supply, Drainage and sewerage, Yard lighting, Fencing, and Firefighting facility
Building and pavements	(Outside terminal) Office, Amenity Block, Warehouse, Transit sheds, Maintenance shop, Gate, etc. Yard pavement area 230,700 m ²
Package 3(Navigation Channel Dredging)	
	River section dredging volume 1,890,857m ³ Sea section dredging volume 8,807,767m ³
Package 4(Equipment)	(Cai Mep)Quayside container crane:4 RTG crane: 15 (Thi Vai)Multi-purpose quayside crane : 2
Package 5(Cai Mep Container Terminal))	
(Vietnamese Government Fund)	
Access Road	New road :8,200m、 New bridge :345m,
Utilities(Outside terminal)	Water and power supply
Improvement of soft soil :	Total 12,255 m
Package 6(Navigation Equipment)	
(Vietnamese Government Fund)	
	Navigation Buoy 1 unit
2. Consulting Service	
	a)Tender assistance and Construction Supervision b) Assistance for selecting port operators
Project Period	March 2005~April 2015(122)
Project Cost	57,698 Million Japanese Yen (of which 42,771 Million Japanese Yen is under ODA Loan)

Source: 2018 Ex-post Evaluation Report

2. Project Chronology

Year	Event
1996	Opening of Phu My Terminal
1999	Port Master Plan targeting 2010(MOT /VINAMARINE)determined to construct the deep-water port at the mouth of Thi Vai river as an International Port., and relocate the port terminals from HCMC.
1998	Decision to designate Industrial zones in Phu My Thi Vai Area (Prime Minister Decision No. 213 / QD-TTg)
2002	JICA conducted the Port Development Study in the South of Vietnam, to set the target area of deep seaport in Cai Mep Thi Vai (CMTV) area.
2003	Government of Vietnam requested for the ODA loan.
2004	F/S study done by MOT、 ~2006The detailed design study on Cai Mep - Thi Vai International Port Construction Project CMTV Management Office is established under PMU85
2005	Loan Agreement (L/A) for Phase I ~2008 JICA Project on the Improvement of Port Management System
2007	JETRO F/S CMTV Port Management and Operator Study
2008	Terminals of CMTV opened excluding terminals under the ODA loan project. (~2012)Ground breaking of Cai Mep Container Terminal. (~2013) Thi Vai General Cargo Terminal (~2015) Access Road and bridge Ground breaking of navigation channel construction Master Plan on Development of Vietnam's Seaport System through 2020, with Orientations toward 2030. (Decision No. 2190/QD-TTg/2009)
2010	(~2011)Navigation Equipment Slip in loaded embankments, small collision with local boats. - Safety measure mid-term review
2011	(~2013)Selection of Port Operator
2011 年	~2013 Consulting Service for Operator Selection of CMTV International Port
2012	(~2013) Instalment of equipment Start to support Ba Ria Vung Tau by JICA for logistics and support industry L/A for Phase II
2013	Shirogane Transport Co.Ltd. set the office in HCMC. The Current Situation of Ports and Strategies for Optimized Container Port Operation in Southern Vietnam submitted to Deputy Prime Minister
2014	Establishment of Tan Cang Cai Mep Thi Vai One Member LLC.(TCTT) Start the operation of Thi Vai General Port JSC(TVGP) Establishment of the Japan Desk at Ba Ria Vung Tau Province. Revision of the Master Plan on Development of Vietnam's Seaport System through 2020, with Orientations toward 2030. (Decision No. 2190/QD-TTg/2009 (Decision No. 1037/2014/QD-TTg)
2015	Construction completion Kyoei Steel, Tatsumi Shokai, Japan Overseas Infrastructure Investment Corporation (JOIN) decided to invest in Thi Vai International Port (TVP)
2015	(~2016)Feasibility Survey for logistics services for the Cai Mep Port Activation by Shirogane Transport, Co. Ltd. Supported by JICA
2016	Establishment of SHIROGANE LOGISTICS VIETNAM Co.,Ltd
2018	TVP started operations. JICA Data Collection Survey on Ba Ria-Vung Tau Province Environment-Friendly Industrial Accumulation and Logistics Hub Strategy
2019	First Japanese logistics company in CMTV , Vina-Japan Shirogane logistics center opened.
2019	JOIN invested the logistics company in CMTV with Sumitomo Corporation and Suzuyo. ⁸⁶
2019	TVP Phase 2 was planned by Kyoei Steel, Tatsumi Shokai
2021 年	Gemalink JV of Gemadept(Vietnam) and CMA CGA (France))commenced the operation.

⁸⁶ <https://www.lnews.jp/2019/07/10709307.htm>_ (Confirmed in June 2021)

Process Analysis of Project Formulation on Lach Huyen International Port Infrastructure Construction Project” in Vietnam



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Purpose of the Process Analysis

JICA conducts ex-post evaluations and publishes their results in order to ensure accountability to the public and extract lessons and improvements for similar projects in the future. However, the current ex-post evaluations focus on confirming the effectiveness (outcomes) of the project based on indicators. The process that directed (or did not) to the development of the project's effects is not always confirmed in detail, and the analysis of success and failure factors is not always sufficient.

In light of this, we focused on the process as well as on the outcomes of the projects. In order to analyse and strengthen the process from this perspective, we have selected projects where useful lessons can be learned, and we have also conducted evaluations focusing on the "confirmation and analysis of the process of achieving effects." The purpose of this process analysis is to analyse and evaluate, from an ex-post point of view, how the effects were manifested, focusing on the implementation process at the time¹.

The "Lach Huyen International Port Construction Project" (hereinafter "the Project") was decided and implemented under the leadership of the leaders of Japan and Vietnam under a strategic partnership and is the first public-private partnership (PPP) project between the countries using yen loans. Therefore, we would like to record and analyse the process of consultation and coordination between the public and private sectors in both countries, including the efforts during the implementation phase of the Project. It will provide useful lessons that can be used when launching similar projects in the future, with a view of strengthening international competitiveness

The impact of COVID-19 infections on the Study

The study was originally planned to start in 2020, but the COVID-19 outbreak limited the number of stakeholders that could be interviewed, which constrained the research. This was due to the following reasons

- The reduction of flights at international airports and the strengthening of waterfront measures.
- The fieldwork was postponed until May 2021, with last-minute changes to the quarantine protocol and the Vietnamese side refusing to allow interviews for being busy dealing with the pandemic
- Particularly, the working system of the staff in the Ministry of Transport (MOT) was affected when a staff member tested positive for the virus.
- The number of people to interview was limited since it had already been more than 10 years after the start of service, and many of those involved have already retired.

Under these circumstances, it was difficult to conduct interviews with MOT officials, so information was collected by conducting several online interviews with former MOT leaders. In mid-June 2021, after the start of the fieldwork in Vietnam, when domestic travel restrictions eased, we were able to travel to Haiphong City for a day, visit the port of Lach Huyen, and interview some who were involved.

The original plan was to conduct two field visits. The first field visit was for interviews and information collection, and the second was for the confirmation of the survey from the Vietnamese side. The plan was

¹As the results of this analysis are expected to provide useful insights for development practitioners working to solve similar development challenges, we have used the analytical framework of the Global Delivery Initiative (GDI), a platform for knowledge from the international development community, including international organizations. While information presented in the report is based on a combination of project documents and these interviews, these findings do not represent the official views of the Government of Vietnam or JICA.

abandoned, and online meetings were used. Due to this limitation of the face-to-face survey, additional information gathering by the Vietnamese consultant was used for further verification.

Introduction

In north of Vietnam, there was a need to develop a deep-sea port in order to cope with the problem of the buried shipping routes for the existing international port of Haiphong. Further, the rapid expansion of logistics around the capital city of Hanoi increased the demand. An international deep-sea port in the Lach Huyen area of Cat Hai District in the eastern part of Haiphong City, long flourished as a port city, was planned. It includes the development of the surrounding basic infrastructure (roads and bridges). The project aimed to (i) respond to the increasing demand for containers in the northern region of Vietnam; (ii) accommodate the increasing the size of containerships in the markets, thereby contributing to the economic development of the whole country, especially of the northern region; and (iii) to reinforce international competitiveness. The infrastructure was constructed as planned. Information on the project is in Annex 1.

This is the first PPP project utilizing the ODA loan under the strategic partnership between the Japanese and Vietnamese governments. The project was financed separately. Construction works, such as dredging of channel (lower parts), were financed by the ODA loan, while the container yards and necessary equipment (upper parts) were constructed and installed. The project was planned to be operated by Haiphong International Container Terminal (HICT) as vertical separation system.

The decision by the National Assembly in 2016 capped public debt at 65% of GDP, placing certain constraints on ODA projects. Nonetheless, the need for infrastructure development remains significant, thereby making the PPP approach increasingly important. In this analysis, it included discussions on the collaboration between Vietnam and Japan and between the government and the private sector during the formation of the project and how problems occurred and were solved, as well as the discussions and agreements on risk-sharing, government guarantees, and project promotion systems that are essential for the formation of PPP projects.

Under these process analyses, the focus was on the technical aspects of the discussion between Japan and Vietnam. The content of Chapter 1 is the summary of the project background, from its inception through to its establishment as a public-private partnership involving loan and private sector investment. Chapter 2 is the summary of the technical aspects of the project, including the process of the proposal on amendments to the outputs of the preliminary survey done by the Vietnamese regarding maintenance dredging for navigation channels and the disposal site for dredged material, and the process of design changes after the construction works damaged by a typhoon. Chapter 3 contains the summaries of the remarkable achievements and concerns after completion. Chapter 4 provides lessons learned, and lastly, Chap 5 outlines the future challenges.



Source: HICT and Sumitomo Mitsui Construction (presentation materials for the Japan Society of Civil Engineers)

Lach Huyen International Terminal and Marine Bridge

Chapter 1. From the beginning of the project to the official acquisition of the business rights

1.1. Outset of the Project

(1) Rapid growth of industrial parks in northern Vietnam

As a gateway to the northern economic zone, JICA rehabilitated Haiphong Port in 1993 when the ODA loan resumed. Then, Cai Lan Port in Quang Ninh Province was constructed also using ODA loan in 2004 (see Figure 1). Around 2005, these ports underpinned cargos of major electronics manufacturers concentrated in the north along with significantly increased foreign direct investment (FDI). The surrounding provinces of Hanoi and Haiphong, vicinity of these ports, has a population of over 20 million and has a huge production and consumption area. In FY 2006, during the project preparation, FDI (on a newly investment basis) totalled 581 projects in the south for \$4.6 billion, 28 in the north for \$2.7 billion, and 44 in the central region for \$1.5 billion. Regarding Japanese companies, there are 70 projects in the north worth \$800 million, 66 deals in the south worth \$200 million, and 10 deals at the central worth \$0.2 million. In terms of the number of FDI projects, the north and south were almost similar, but in terms of value, the investment in the former was higher. Many of the investments by Japanese companies in the north is large scale. Toyota, Honda, Canon Brother Industries, etc. have already set up in the north.²

On the other hand, the longer a containership is on a long-distance route, the more cost-effective it is to use a larger ship. In order to transport containers from Haiphong to North America, they had to be transported to Hong Kong on a smaller ship and transhipped. The development of a port in North Vietnam that can accommodate larger vessels will shorten the transport period without transhipment in Hong Kong and reduce freight costs, thereby increasing competitiveness. Therefore, the development of a deep-sea port, like the one planned in the south, was also urgently needed in the north.

The port of Cai Lan is located about 150 km from Hanoi. The depth of the channel is 10 m and berth is 12-m long. By waiting for the tide,³ it is possible to accommodate a ship of 30,000 T. However, the surrounding infrastructure, including access roads, was insufficiently developed and the waiting time for the tide was costly. In addition, due to the location of the port near Ha Long Bay, which was registered as a World Heritage Site in 1994, the traffic of large cargo ships has been regarded as a problem by the nature conservation groups. Obviously, it has been difficult to increase the depth of the waterway and to extend the berths.

In addition, Haiphong Port, which has more than ten terminals along the Cam River, has a depth of merely 7 m. Accordingly, the scales of vessels that can enter port are even smaller. Together with Cai Lan Port, the total volume of containers handled was limited as 4 million TEUs.⁴ The likely demand of the northern industrial sector eventually would be too much to meet. Therefore, during the development of Cai Rang Port, the Vietnamese Government compared potential sites for a new deep-sea port in the north and finally concluded that the Lach Huyen area, on the sea side of Haiphong, was suitable from the point

² Lach Huyen Port Development Study (FY2007 Itochu and Nippon Koei)

³ Waiting until near high tide to allow large ships that cannot call at the port due to insufficient water depth to enter the port by taking advantage of the tidal difference between the ebb and flow of the berth.

⁴ Twenty-foot Equivalent Unit; most common international standard to express the capacity of a containership in a uniform manner. A forty-foot container is regarded as two twenty-foot containers or 2 TEU.

of view of securing industrial parks.⁵



Source: Ex-post evaluation report on Hai Phong Port Rehabilitation Project, 2012.

Note: Blue line: navigation channel dredged by the Project, orange: berths 1 and 2 constructed by the Project, yellow-red encircled: berths to be constructed by private companies in the future (after berth 3), green: bridges and access roads constructed by the Project)

Figure 1 Map of Lach Huyen Harbor

(2) Outset of Lach Huyen Port

In 2005, Transport Engineering Design Inc. (TEDI), a Vietnamese consulting company, started a feasibility study (F/S) of the project⁶. Based on the F/S, TEDI proposed to complete 2 berths in 2008 and prepared a master plan to build 11 berths in total by 2020, including 4 container berths, 2 bulk berths, and 5 general cargo berths. The state-owned shipping company VINALINES⁷, a subsidiary of MOT, secured the sole right to operate the first two berths by MOT nomination. Japan began to involve the project when VINALINES approached the Japanese side to participate in the investment for the third and fourth berths. Since VINALINES had no experience of operating a container terminal for large vessels, they wanted an experienced Japanese shipping company that could also collect cargo to participate. Furthermore, the company expected to utilize the ODA loans to finance the enormous costs of building the terminal and dredging the channels.

1.2. Preparation through cooperation between the public and private sectors in line with the infrastructure export strategy

Even before the momentum of Japan's infrastructure export policy began around 2010⁸, there was enthusiasm for successfully initiating a private sector-led infrastructure development project with the

⁵ Alternatively, Nam Do Son of Haiphong, Cam Pha of Quang Ninh, Nghi Son of Thanh Hoa Province were nominated. The study of such alternative sites had already started in the 1990s accordingly.

⁶ There was a support from Korea in 2008 according to the consultants conducted for F/S.

⁷ VIETNAM NATIONAL SHIPPING LINES, commonly known as VINALINES. A state-owned shipping company. It was renamed Vietnam Maritime Corporation (VIMC) in 2020 and became a joint stock company.

⁸ The New Growth Strategy announced by the Democratic Party of Japan (DPJ) government in June 2010 set out a policy to promote the overseas development of packaged infrastructure.

Ministry of Economic, Trade and Industry (METI). The Vietnamese MOT has experience in implementing large-scale port projects (Cai Lan Port, Cai Mep Chi Vai Port, Da Nang Port, etc.) under Japanese ODA loan projects. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan also supported in the development of the port as it was appropriate to develop it in a vertical separation system: private investment in the upper structure and ODA in the lower structure. The consensus for the support of the Lach Huyen Port was quickly established through the joint efforts of the METI, MLIT, Ministry of Foreign Affairs, and JICA. A PPP scheme⁹ for accelerated growth was agreed between the Japanese and Vietnamese authorities. Vietnamese port officials, Japanese trading companies, shipping companies, and the METI worked together for initial preparation of the project.

1.3. Foreign countries keen eye on the potential of northern ports

However, Japanese support was not easily accepted by the Vietnamese side. At that time, Korean companies, such as Pusan Port, expressed interest in investing in Lach Huyen Port in the context of the large-scale FDI from Korea, including Samsung and LG. The Japanese side explained the cement deep mixing method (CDM)¹⁰ that Japanese construction companies have sufficient experience with, as a countermeasure against soft ground, and also the expected technology transfer through the construction of a 5.4 km-long marine bridge, the longest in Vietnam. CDM was already recognized, with the use of Japanese large vessels and equipment, could shorten the construction period of the preceding Cai Mep – Thi Vai Port project compared to the method using the equipment available in Vietnam. The various Japanese technologies introduced and anticipated technology transfer through the construction were highly appreciated. Furthermore, the favourable conditions of the Japanese ODA loan, with a 40-year repayment period and an interest rate of 0.1% under the Terms and Conditions for the Special Terms for Economic Partnership (STEP), were explained to the stakeholders in Vietnam.

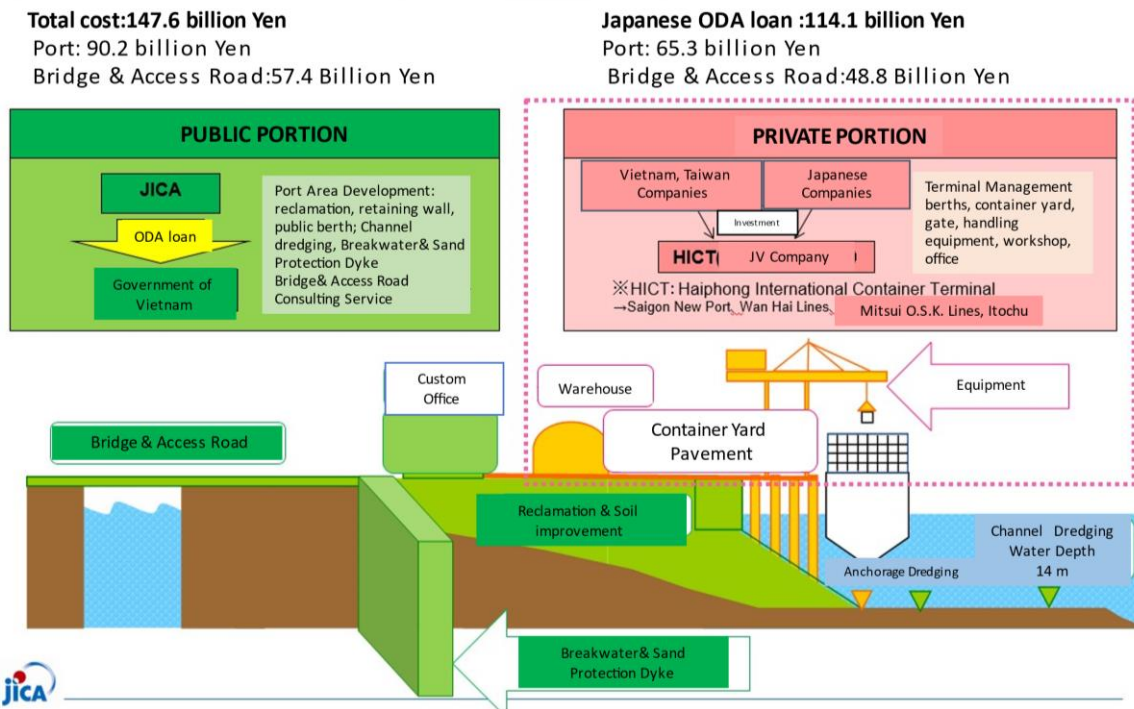
Eventually, both Japan and Vietnam reached a consensus in how to develop the Lach Huyen Port. The preparation began as a PPP project; however, construction of the bridge and access road from Haiphong City at the same time is the prerequisite for the port operation. The total cost of the port, bridge, and access road would be more than 100 billion yen. Accordingly, there were doubts on the part of the Vietnamese side as to whether the Japanese side would integrate those into a single project and support as a whole. MOT, aiming to start construction as soon as possible, was also concerned about the loss of time in terms of procedures. Taking the opportunity of the visit to Japan by the Deputy Minister of MOT, the Vietnam side directly reiterated to the Japanese officials to proceed with the project as a whole¹¹. The Embassy of Japan and JICA jointly made efforts to prepare the ODA loan project as a single project, called “Lach Huyen Port Infrastructure Construction Project,” which includes access roads and bridges.

⁹ A Public-Private Partnership (PPP) is a private-sector scheme that requires the government to provide the necessary support for a private-sector project.

¹⁰ Cement Deep Mixing Method ; Cementitious hardener is injected into soft ground, stirred and mixed together with the soft ground, and chemically solidified by the deep mixing method of mechanical stirring. The Vietnamese side had some experience with the CDM method, but its application in large-scale construction was limited.

¹¹ Based on the interview with the MOT.

The total cost of the project and the public and private contributions are shown in Figure 2.



Source: JICA

Note: The private sector financed the construction of the container yard and cargo handling equipment, mainly gantry cranes. Figure 2 PPP

Figure 2 Scheme under the Lach Huyen International Port Project

Chapter 2. Development Challenge

2.1 Hasten the process from project formation to construction start

After the port F/S by MOT of Vietnam, another F/S study was done with the support of the METI of Japan. Subsequently, the project formulation study for the port was done on 2009 and for the road and bridge was on 2010 by JICA. In 2011, the first phase of the loan agreement was signed. The Vietnam side urged to inaugurate the port in 2015 (the 70th anniversary of the country's independence), but the minimum construction time required was 41 months, which was a very difficult requirement to meet from the outset, given the time required for the preliminary detailed design, which was not possible to open in 2015.

Normally, the detailed design (D/D) of the ODA loan project was carried out by consultants employed by the counterpart government, but D/D for this project was financed by JICA as technical assistance related to ODA loan. However, the issue of D/D liability, i.e., which party is responsible for defects after the completion of the project, arose when the D/D was carried out by JICA technical assistance. In order to properly guarantee the quality of the design work, JICA decided to implement the Japanese Technical Assistance Committee (a total of seven meetings on ground improvement and dredging of the navigation channel) and concluded a legal agreement document to clarify the location and scope of civil liability for the D/D task. This is a legally binding document that confirms the legal framework of the project, including the scope of responsibility of the private sector, the means of resolution in case of disputes, and the applicable law, between the signatory JICA, the implementing agency of Vietnam, and the D/D consultant. As a result, the quality assurance of the design work and the scope of the private sector's responsibility were clarified and construction began.

2.2 Disposal of dredged material –Japan's proposal for revision

Based on the F/S prepared by TEDI, MOT planned to use the dredged material from the navigation channel for reclamation for the construction of an industrial estate (see Figure 2).¹² In particular, the Haiphong City People's Committee proposed that the dredged material should be used for reclamation, as described above. MOT also argued that it would be better to build a weir and use the dredged material as reclamation sediment for the formation of an offshore industrial park, given the close proximity of Cat Hai Island to the South Dinh Vu Industrial Park on the other side of the river, which is approximately 10 km away. However, the consultant who carried out the D/D examined the soil at the proposed dredging site and found that the particles were too small to be suitable for reclamation. In addition, using it would require large-scale additional works, such as the construction of an enclosure wall, which would require long-term preparation. The alternative proposal, therefore, was to designate a soil dumping site at sea.

Due to proposed changes by the D/D consultant against the plan already approved by the Vietnam side, the discussion over the validity of the proposal was prolonged. In June 2011, issues on items initiated

¹² According to the MOT Decision No.476/QD-BGTVT, depth of maintenance dredging 12.8m, Dinh Vu South Industrial Zone, Cat Hai South Offshore as the soil dumping site were approved.

by the Vietnam side (e.g., ground improvement methods) were to be resolved through a D/D. After signing the first phase of the Loan Agreement in November 2011, discussions continued. Several meetings were held, chaired by the Deputy Minister of MOT, and the D/D consultant presented the study output every time. Afterwards, the deputy minister sent questions to the D/D consultant and requested answers within a week. By February 2012, the D/D consultant briefed the deputy minister, and in April 2012, directly the minister. The final agreement was reached by June same year as to disposal.

The D/D consultants carried out simulations of the dredged material being dumped offshore and being used for coastal reclamation to provide the necessary data for the environmental impact. Furthermore, they demonstrated a required additional project cost of approximately JPY 30 billion if the dredged material were to be used for the development of an industrial estate.¹³ The results of the study showed that the project would cost about JPY 30 billion more if used for the development of an industrial estate. The D/D consultant also explained a case of an industrial estate built on reclaimed land using dredged material from the seabed at Laem Chabang Port in Thailand. Since this case failed to stabilise after about eight years, pursuing to use it for reclamation was reconsidered. The Japan side spent several months persuading the Vietnam side to determine the best implementation plan, including the disposal method of dredged material, while paying attention to environmental protection. Finally, by June 2012, the Vietnamese side agreed on offshore disposal.¹⁴

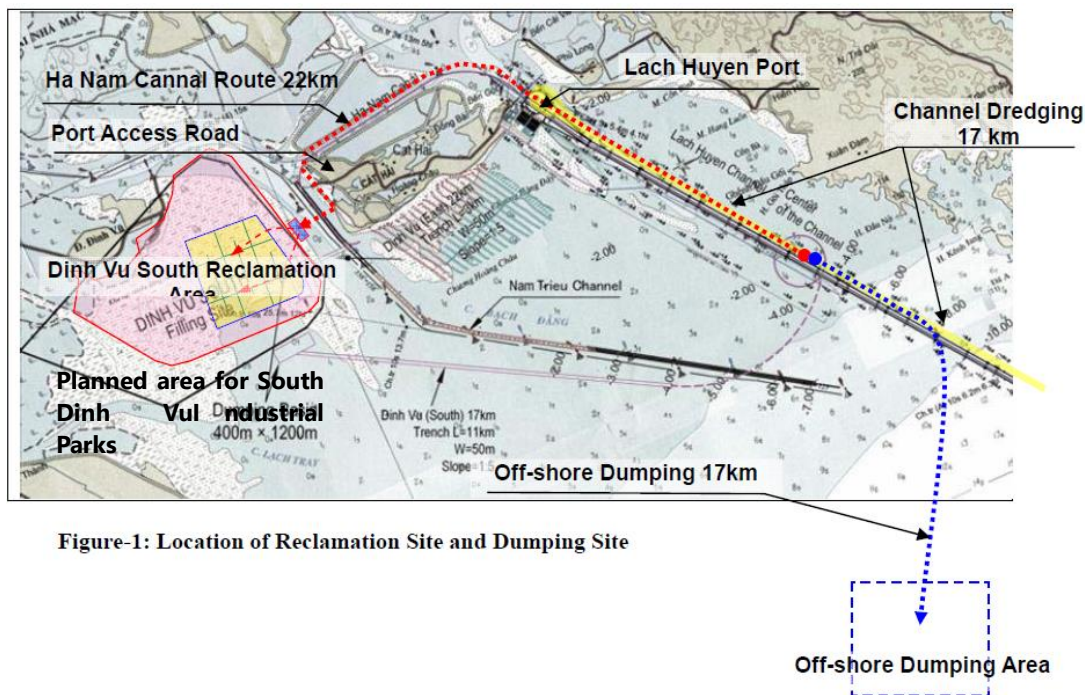


Figure-1: Location of Reclamation Site and Dumping Site

Source: Comparison Study on Dredged Soil Dumping Sites of South Dinh Vu IZ and/or Offshore Area, March 2012, JICA D/D Study Team.

Figure 3 Proposed Location of Reclamation Site and Dumping Site

¹³ Disposing of the dredged material off-shore would be about VND6,000 billion cheaper than reclaiming it to build an industrial park, according to the Comparison Study on Dredged Soil Dumping Sites of South Dinh Vu IZ and/or Offshore Area, March 2012, JICA Detail Design Study Team

¹⁴ Assumingly, a lot of time was spent for agreement as it also involved developing industrial parks.

2.3 Consensus building on the differences between the Japanese and Vietnamese approaches to maintenance dredging

Foreseeing the increasing cargo on the North American route, the Japanese side proposed that the terminal should be dredged to a depth of 14 m in order to accommodate larger vessels (8,000TEU or more, with a deadweight of 100,000 T or more, see Table 1). The water depth is a fundamental issue for the profitability of the terminal project and the 12.8 m F/S proposal prepared by the Vietnam side was considered insufficient for the Japanese investors. The Vietnamese government would maintain dredging the channel, though the dredging of the navigation channel itself is carried out by ODA. At the time of the implementation of the D/D in 2010, the Vietnam side did not accept the request of the Japan side to dredge a depth of 14 m at first because the container cargo was lesser than expected in Cai Mep Port, the south of Vietnam, at that time. Vietnam side was anxious about the reliability of the cargo demand forecast of this project. MOT insisted on the 12.8 m depth when the port opened, and a proposal to increase to 14 m in view of the subsequent growth in demand. The Japan side could not agree to this plan and consulted their embassy, where a meeting between the Ambassador of Japan and the MOT was set up in December 2013. However, the reply was that if 8,000 TEU (100,000 T deadweight class) containerships were to call at the port, the 14 m would be maintained. But if only smaller ships were to enter, only 12.8 m could be guaranteed.

Table 1 Key standard values for ships

Deadweight tonnage DWT (t)	Overall Length (m)	Full load draught (m)	Reference: Loading capacity Number of containers TEU
10,000	139	7.9	500~ 890
20,000	177	9.9	1,300~1,600
30,000	203	11.2	2,000~2,400
40,000	241	12.1	2,800~3,200
50,000	274	12.7	3,500~3,900
60,000	294	13.4	4,300~4,700
100,000	350	14.7	7,300~7,700
140,000	366	15.5	11,500~12,400
165,000	381	16.0	13,700~14,500

Source: MLIT, Japan

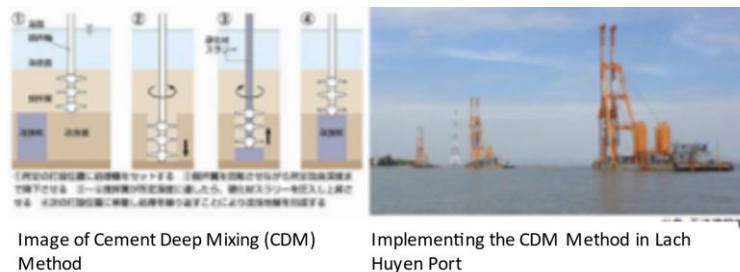
In conclusion, the Vietnam side concluded that the Prime Minister's decision on the water depth was necessary. In November 2013, the Government Office stated, "First, MOT in cooperation with the Ministry of Planning and Investment (MPI), the Ministry of Finance (MOF), and relevant agencies, approved to consent on a dredging schedule to reduce the depth of the shipping channel as planned having discussed with the donors and investors of the private part of the Project and taking into account the additional investment after 2022. Second, MPI and MOF allocate sufficient funding for MOT to implement the commitments notified to the donors under this plan."

In December 2013, the MOT and the Japanese Ambassador to Vietnam reaffirmed their agreement to dredge the Lach Huyen Port channel to a depth of 14 m from the commencement of the project. In February 2015, a revised version of the project plan (F/S prepared by TEDI) based on this agreement was

officially approved by the Vietnamese government. The efforts of the Japanese side to persuade MOT and the Government Office were successful, and an agreement to set the water depth at 14 m was finally reached. The Vietnam side was finally convinced by the economic loss of not accommodating larger containerships, based on the changes in the market. The increase in exports and investment in the surrounding area and the importance of respecting the opinions of private investors in the first PPP project between Japan and Vietnam utilizing the ODA loan were also considered.

2.4 Special Terms for Economic Partnership (STEP)

The CDM method (Figure 3) was already practiced in Vietnam. Excluding the terminal construction of the Cai Mep area in the south, however, the scales are much smaller. In 2013, the Japanese company was awarded the contract to carry out ground improvement works expecting sound management and shortening of the construction period since it was considered to be the most challenging for the project.



Source: MLIT

Figure 4 The CDM method (ground improvement), one of the Japanese technologies introduced in the project

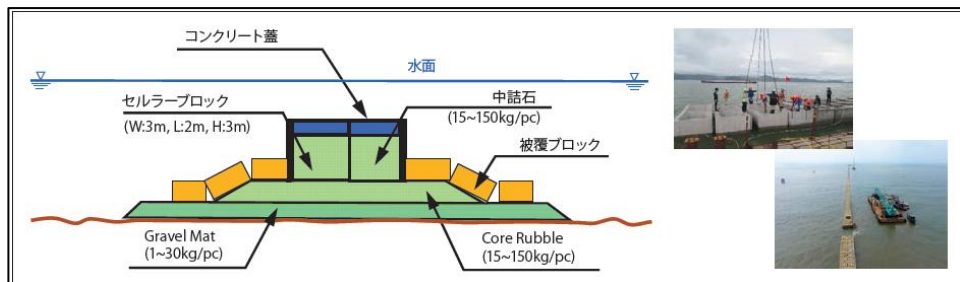
Table 2 Items originated by Japanese technology used in the construction of the project

Name of Package	Origin of Japanese Technology	Application of Japanese technology
Land reclamation and ground improvement for the construction of a container terminal	Approx. 21%	Ground improvement (CDM, steel pipe hangers, fenders, bollards, etc.)
Navigation channel and anchorage dredging (PART A)	Approx. 59%	Loss of dredging equipment (grab dredger)
Navigation channel and anchorage dredging (PART B)	Approx. 57%	Dredging equipment loss costs (cutter suction dredger)
Breakwaters and sand dykes	Approx. 12%	Navigation beacons
Total	Approx. 30~35%	

Source: Civil Engineering Consultant Vol. 278, January 2018.

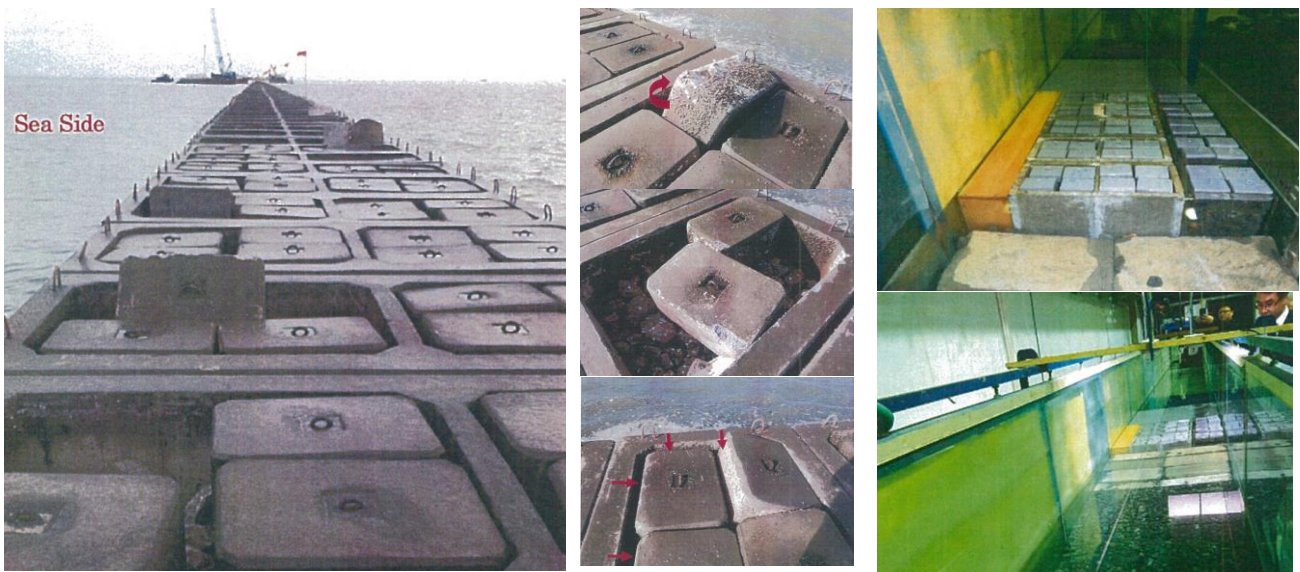
2.5 Typhoon damage during construction and technology transfer through countermeasure studies

Based on the agreed by the D/D, reclamation and ground improvement works for the construction of the container terminal (water depth of 14 m, length of 750 m, and 2 berths) started in 2013. The construction of a breakwater (3,230 m) to prevent waves from overtopping the terminal and a sand dike (7,600 m) was in 2015. In 2016, construction began on the dredging of the navigation channel and anchorage (14 m deep, 160 m wide, 18 km long)



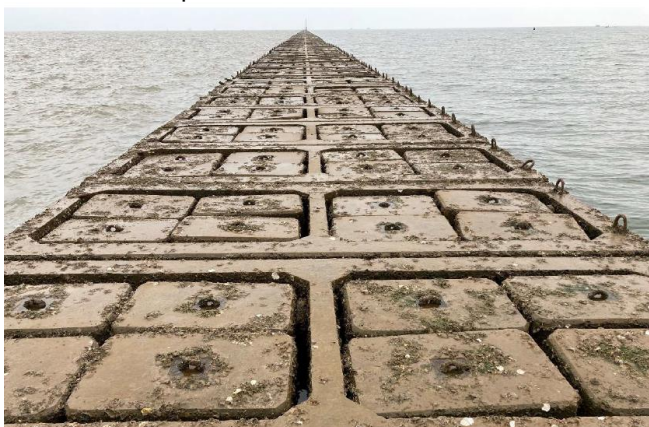
Source: Civil Engineering Consultant Vol. 278, January 2018.

Figure 5 Standard cross-section and installation of sand dykes

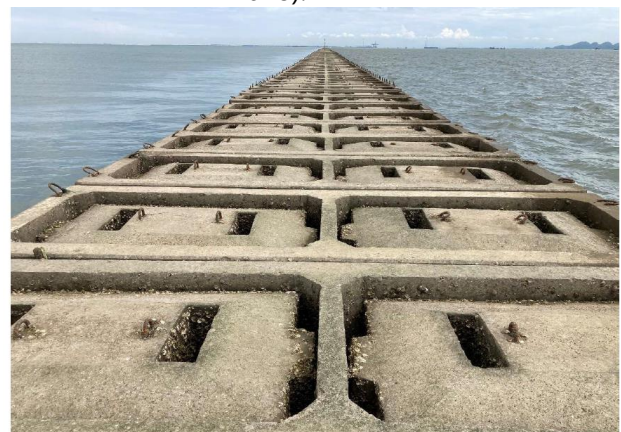


The lid of the complete block damaged by the maximum wave force of nearly 3 m in height due to a typhoon (first time in July 2017 and second in September 2017).

Hydraulic model experiments at the University of Tokyo (March 2018).



Cellular upper lid concrete blocks (quadrupartite)



Proposed countermeasures (improvements after hydraulic model experiments)

Source: Nippon Koei

From the beginning of the project, it was predicted that the tendency of burial would increase, so it was decided to construct a sand dike. However, During the construction in 2017, a typhoon damaged the

cellular block cover, as shown in Figure 5, so Construction Supervisor Consultant investigated the occurrence and cause of the damage.

As a result, the construction management consultant decided that a design change was necessary and discussed it with Professor Yoshimitsu Tajima, one of the leading experts in coastal engineering in Japan, from the University of Tokyo.¹⁵ With his cooperation as part of the research, including the use of experimental facilities and mobilisation of students, the hydraulic model experiments were carried out over four and a half months, including a field survey. The changes in the design were approved by the Maritime PMU (MPMU), the construction manager from the Vietnam side. The National Quality Inspection Council (SAC) of Vietnam was consulted subsequently, and the approval procedure was requested.

Results of the hydraulic model tests supported by the University of Tokyo were reported to the Vietnamese government and later approved by MOT, resulting in a Variation Order in the construction contract (2018). The contractor in charge of the construction agreed to adjust the schedule to improve the technology without delaying the overall schedule by proceeding with other tasks. After the experiment, the concrete lid was modified from four sections to a single unit, and the concrete blocks were designed with voids and an upper slope to ensure stability given the effects of wave forces (see the photo).

The overall cost of the section was reduced resulting from fewer installations, which the Vietnamese officials appreciated. The typhoon revealed weaknesses in the blocks, which were quickly remedied on a technical basis through experimentation. It demonstrated an example of technology transfer during construction.¹⁶

2.6 Challenges faced against obtaining the approval for the Environmental and Social Impact Assessment Report

The project involves extensive construction work and anticipates having an impact on the sea area. In order to prepare and submit an Environmental Impact Assessment (EIA) report, Vietnam Maritime Administration (VINAMARINE already established a department in charge of it. However, due to the proximity of the Project to the environmental protection area, the Ministry of Natural and Environmental Resources (MONRE) raised concerns about the large amount of dredged material (approximately 40 million m³) that would be disposed off-shore and the burial of the shipping channel. Concerns were also addressed about the possibility of mixing the dredged material with waste from the plant. By utilizing the results of a study by the D/D consultant, which included analysis of the sediment, simulation of sedimentation, and consideration of alternatives, the Project complied with the strict requirements of MONRE and received approval.

With regard to social impacts, Haiphong City provided sufficient advance information (construction plan, post-service conditions, and environmental management plan) to Cat Hai Island, the location of the terminal. In addition, the project made a social contribution by repairing the local kindergarten, providing

¹⁵ Professor Tajima is from the Department of Civil Engineering in the Graduate School of Engineering of the University of Tokyo.

¹⁶ Based on the Construction Supervision Consultant and MPMU (Construction Manager).

support for people living with acquired immunodeficiency syndrome (AIDS) and measures for infection prevention, and providing employment for local people¹⁷. A budget has also been set aside for the training and qualification of construction workers. It was also confirmed that there are many fishermen on the north-eastern side of Cat Ba Island, opposite the proposed Lach Huyen Port, but not on the location of the bridge on the western side, and the necessary compensation plan was prepared and implemented.¹⁸

2.7 Response to criticism of the construction of Lach Huyen Port

After the outline of the project based on the D/D was published by MOT in 2011 as Decision 476¹⁹, there had been some expert objections and biased criticisms against the Japanese development preparations and technical proposals. These included the environmental impact aspect, the reliability of the technology (length of the breakwater, sediment build-up), the huge cost and profitability, including criticism of the high cost of Japanese ODA, and distrust of foreigners having a share of the concessions. About the environmental impacts, some comments were based on the misunderstanding on the proposal of the off-shore disposal of dredged material, as merely considered costs without thoroughly checking JICA's D/D study.

The report and advice prepared by the D/D consultant provided sufficient materials to convince those inside Vietnam that are against the Project. MOT explained to them, through a dialogue, that the criticisms were not based on sufficient economic and technical grounds. The criticisms were not directed at JICA, but MOT took the initiative to resolve the situation and show leadership as the implementing agency without criticism squarely directing at JICA.

Partly because the D/D was born by JICA, explanatory materials for the Vietnamese government were requested one after another. It took substantial time to study the important soil dumping site and the water depth, which was a great burden for the D/D consultant and JICA in the position of management out of doubt. However, by continuing to provide the technical evidence, the implementing agency, the Ministry of Transport, become confident and finally reached a deeper understanding of the environmental impact, the technical aspects, and the cost-effectiveness of the project. At the same time, it should be noted that the technology transfer from Japan was highly appreciated.

¹⁷ Based on the interview with the VINAMARINE

¹⁸ As facing difficulties for conducting interviews, responses were not be obtained from Haiphong City.

¹⁹ DECISION on approval for adjustment of Hai Phong international gateway port cbonstruction investment project- Starting stage No. 476/ QD-BGTVT(15 March 2011)

Chapter 3. Remarkable achievements and pending issues

3.1 Management status of Lach Huyen Port

Completed in May 2018 and inaugurated in February 2019, Lach Huyen Port can now offer direct services to Europe and the United States (US) thanks to the operation of large vessels. Transportation of goods to Europe and the US east coast, for example, only takes five to seven days, less than through Hai Phong Port.

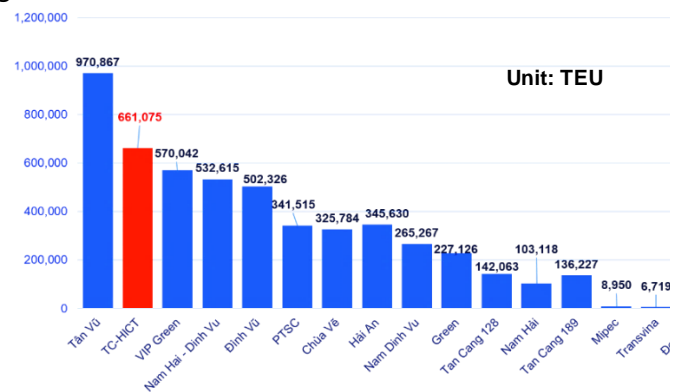
Together with the volumes handled by other terminals at Hai Phong Port, container throughputs in Northern Vietnam have been growing steadily, as shown in Figure 6. The Lach Huyen Port handled approximately 500,000 TEU in 2018 after its opening. In 2019, it was 420,000, and by 2020, it was 660,000 TEU (TC-HICT shown in Figure 7) or 60% of the business plan within two and a half years of opening. As of 2021, three liners serve the port per week from North America and seven liners per week from China, South East Asia, and South Asia. Since the depth of the terminal along the Cam River in Hai Phong City is around 7 m, large ships cannot call at the ports. Consequently, the advantage of the Lach Huyen Port remains unchallenged. Furthermore, it has already been decided that Hai Phong Port Corporation (VINALINES terminal operator) will operate terminals 3 and 4. According to the plans of MOT for the development of the Lach Huyen Port, it will take place as shown in Table 3 and Figure 9. These expansions will also foresee the reduction and relocation of port terminals along the Cum River, which have become inefficient.



Source: HICT

Note: The Blue are throughputs of Haiphong, while yellows are that of Cai Lan Port

Figure 6 Container Throughput in Northern



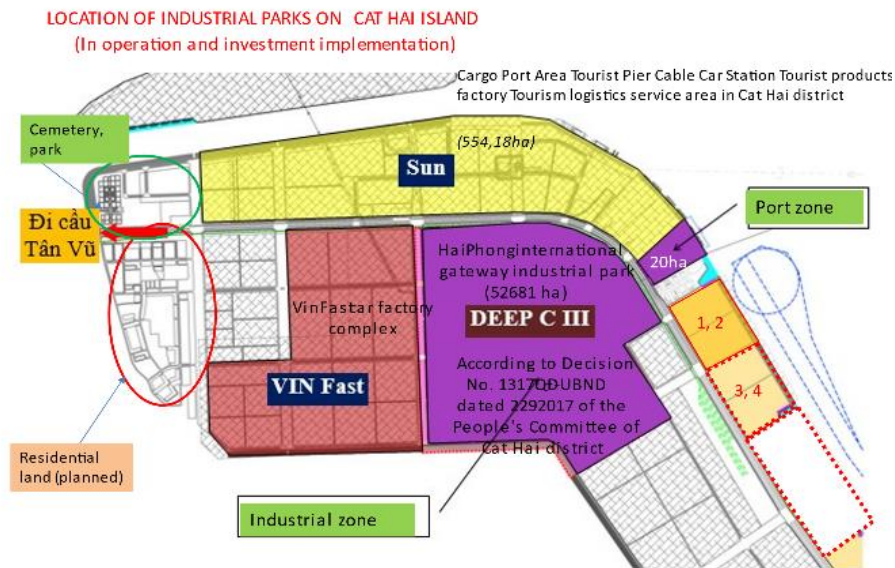
Source: HICT

Note: The Red represents throughputs of Lach Huyen Port (TC-HICT).

Figure 7 Container Throughput Lach Huyen Port and other terminals in Haiphong City (2020)

Although industrial parks already existed in the industrial corridor from Haiphong to Hanoi, the Vietnamese companies, Sun Group and Vin Group, and Belgian company Deep C have developed industrial parks on the land bordering Lach Huyen Port (Figure 8). Cat Hai Island, the location of the port, has been transformed from a remote fishing island by the Vin Group, which has set up a car factory (Vin Fast) and a cable car for tourism (Figure 13). The announcement of the construction of a port and motorway led to an increase in investments from South Korea and Europe, including the construction of a huge Bridgestone plant. Haiphong is now one and a half-hour away from Hanoi by a motorway, and it now has an AEON

mall and an international airport. Japanese companies continue to expand not only in industrial parks but also in the service industry.

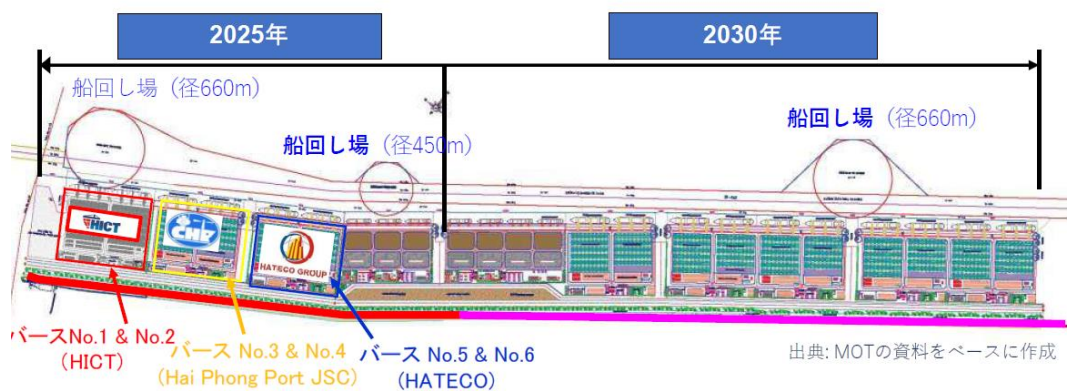


Source: Adjustment of Detailed Planning of Lach Huyen Port Area to 2020 Orientation to 2030

Figure 8 Industrial Estate of Cat Hai Island and 1st, 2nd Terminal of Lach Huyen Port

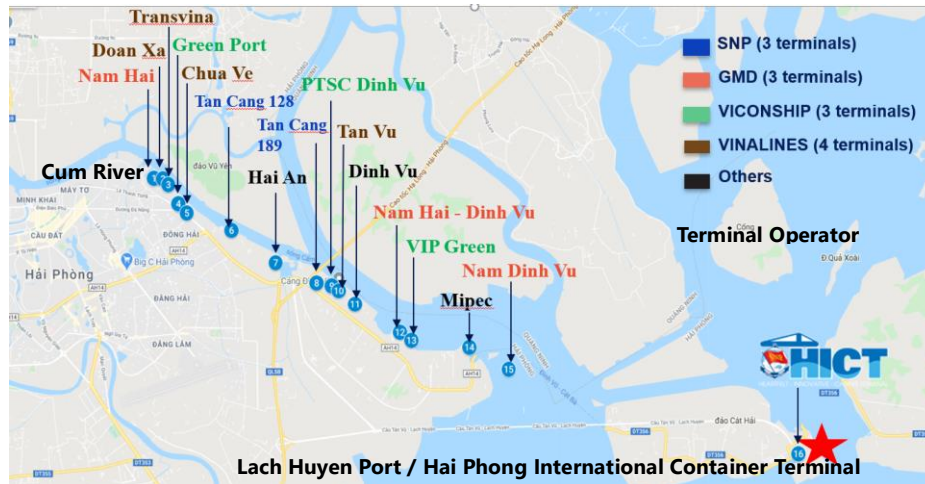
Table 3 Development Plan of Lach Huyen Port by MOT

Items/Target Year	2025	2030
Berth for Containership Number/Length	6 berths / 2,250 m	16 berths / 6,000 m
Berth for General Cargo Number/Length	3 berths / 750 m	7 berths / 1,750 m
Design vessel size	100,000DWT (8,000TEU)	100,000DWT (8,000TEU)
Expected Throughput per Year	45-50 million t	115-125 million t/
Port Area	314 ha	686 ha



Source: HICT

Figure 9 Development Plan of the Lach Huyen Port by MOT



Source: HICT

Figure 10 Port Terminals in Haiphong City

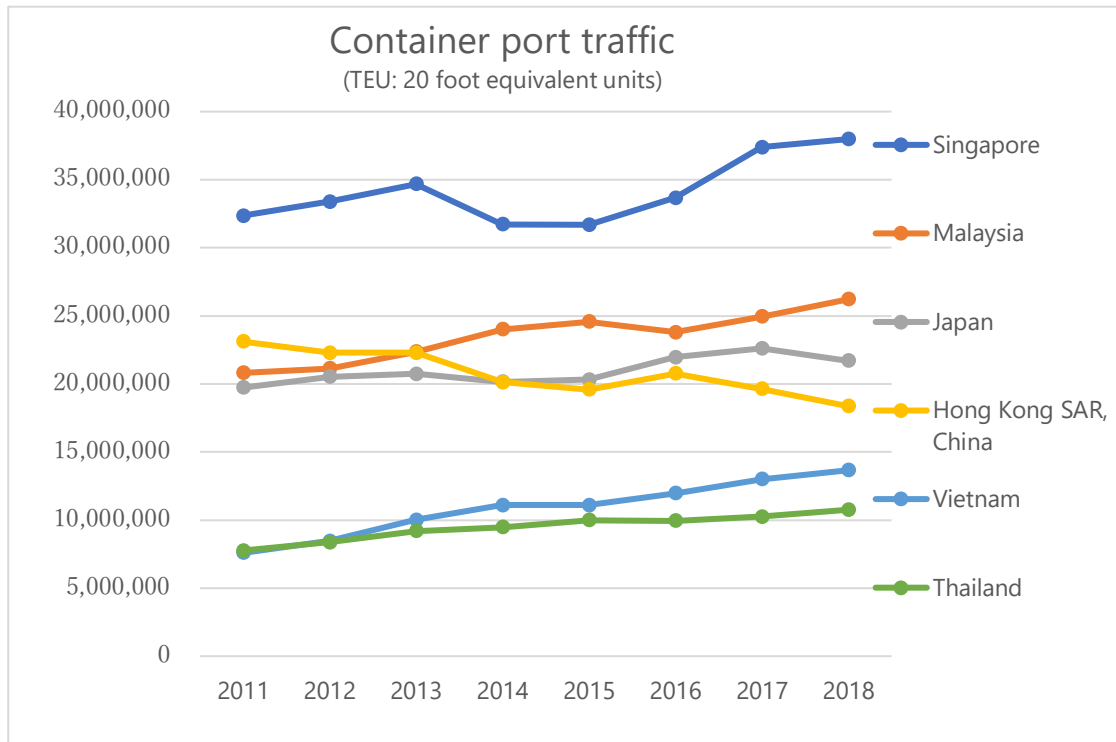
As shown in Figure 11, there are several terminals along the Cam River in Haiphong, some of which have deteriorated. They are planned to be gradually relocated to the Lach Huyen port area because of the congestion and accidents caused by container trucks²⁰. The urban landscape of Haiphong will also undergo major changes.

3.2 Supporting the relocation of manufacturing base to Vietnam

Lach Huyen Port underpins the expansion of imports and exports of the manufacturing base in the North of Vietnam. Figure 15 shows the container handling volume in Vietnam has grown steadily since 2011 when a deep-sea port was completed in the south of the country. Eventually, in 2013, it overtook Thailand. The recent friction between the US and China increased the volume of data-related equipment from Vietnam to the US. Data equipment exporters are more concentrated in the north of the country than in the south. The development of the Lach Huyen port had a significant impact. Without the development of the 14 m-depth Lach Huyen Port, which accommodates large vessels and transport directly to the US. Vietnam may not have been able to export sufficiently to respond to the surging demand from the US. As shown in Figure 12, data-related equipment exports of Vietnam to the US have risen sharply in inverse proportion to the decline in exports of China from around 2019.

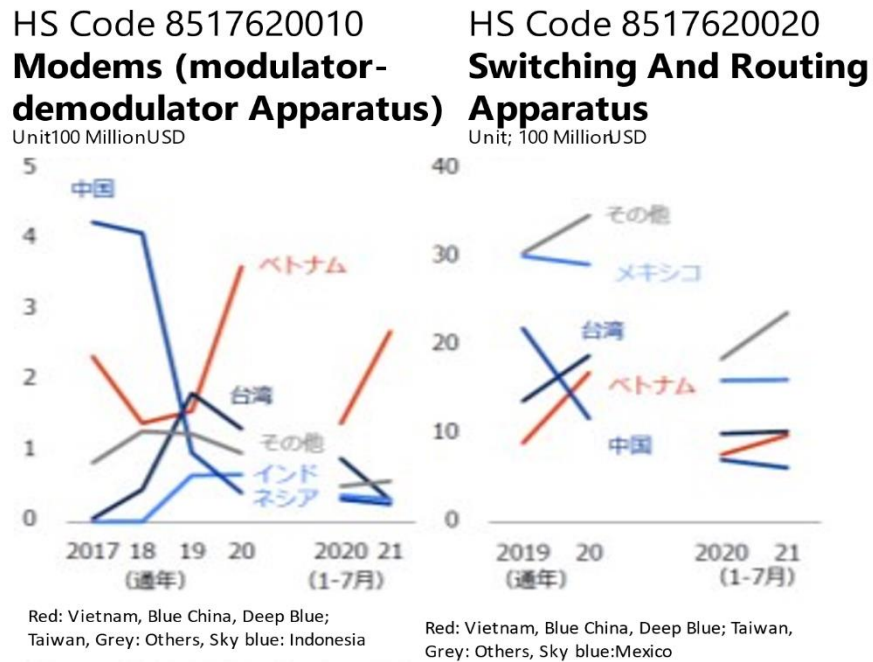
Immediately after the opening of the port, the organic linkage among Hanoi (with a population of 8 million), Haiphong (with a population of 2 million), and the industrial parks being developed in the surrounding area became clear. It made the region a major production base and a significant contributor to the industrialization of Vietnam.

²⁰ Based on the port development plan prepared by the MOT and urban development plan prepared by Hai Phong City.



Source : Prepared by the data of the World Development Indicators

Figure 11 Container Port Traffic in the Region



Source: World Trade and Investment Report 2021 Seminar "Changes in the World Economy and Trade" JETRO 14 September 2021

Figure 12 Changes in the top U.S. import partners for data-related equipment

3.3 Delays in the establishment of Port Management Boards (PMB) for the efficient operation of the various terminals in the northern ports.

As of 2021, an F/S is being prepared for the construction of a new deep seaport in Quang Ninh province, approximately 100 km away from Lach Huyen Port. It is inexplicable that another new port project is being prepared when there is a master plan to expand the berths at Lach Huyen. This reminded the fragmented investment plans in the south where large container terminals are planned for Cai Mep, but alternative ports were being built on the outskirts of Ho Chi Minh City. Possibly, this new planning is a result of the current regime that makes consensus building difficult for those involved in the port sector in Vietnam, i.e., the separate management of the planning, development, and operation of land, water bodies, and infrastructure behind ports by multiple ministries and local governments. In other words, the coordination between localities and specialized management units or line ministries is still quite limited.

Chapter 4. Extraction of values and lessons learned

By following and analysing the process of this project, the values found are summarised below,

- 1) At an early stage of the project, a consortium of private companies (the terminal operators of the port) was formed that could enable the specification of the port more competitive for an international hub port by setting the length of the berth from 600 m to 750m, water depth to 14 m, etc. to accommodate large containerships. Taking into account the intentions of trading companies and shipping companies with experience in the port terminal business, modifications were proposed against the F/S prepared by the Vietnamese side to correspond to the market needs. The terminal operator appreciated the fact that it was possible to minimize the design and cost required, rather than having to build total components by the ODA loans²¹.
- 2) As the project was within the framework of the Japan-Vietnam Strategic Partnership, any differences of opinion between Japan and Vietnam could be discussed at the top level with the Deputy Prime Minister and the MOT. MOT managed both the yen loan part and the private part of the project, tried to understand the investor's requests and the advice of the consultant in charge of detailed design, and continued to try to promote the formation of a consensus between Japan and Vietnam²².

Chapter 5. Challenges and Recommendations for the Future

5.1 Recommendation for Vietnam

(1) Enabling the market for the private sectors' participation

The Minister of MOT in 2015 announced that "the Lach Huyen Deep Sea Port will be the last port project to be financed by the government budget. The government will only finance projects related to national defence and security." Since there has been still a great demand for infrastructure development,

²¹ Project Design, Coordination and Engagement are applied in Delivery Challenges under GDI.

²² Commitment & Leadership is applied in Delivery Challenges under GDI.

MOT has created a PPP Department and has been working hard to improve the business environment for attracting private companies during this project period. While there is a policy of encouraging private sector investment in the port sector, the situation remains where the risks that the private sector has to shoulder are substantially large. It is hoped that this will be addressed with further legislation in the future at the macro level (i.e., the Government and the National Assembly of Vietnam).

(2) Strengthening further for the Port Management Structure

The Maritime Act enacted in 2015 stipulates comprehensive management of ports through the establishment of Port Management Boards (PMBs). In Northern Vietnam, including Haiphong City, the MOT has been working hard to establish PMBs, but only to fail, due to the fact it requires the change of legal systems beyond MOT. Involvement of the Ministry of Justice, other authorities are necessary. There is therefore no immediate prospect of sorting out the complex interests involved and establishing a PMB. However, if the problem of the inconsistent management system of the port is not overcome, concerns remain over the Lach Huyen Port which must operate efficiently and become more competitive as an international hub port. As MOT cannot solve this problem on its own, appropriate and urgent intervention from the Vietnamese central government is important.

(3) Further Improvement of Connectivity

As a sole deep-sea and gateway port of the Northern Region, Lach Huyen port handles container and general cargo and will be the new destination for old port facilities located upstream of the river in Haiphong Port. Since the Lach Huyen Port plans to expand the berths successively, high growth of freight traffic will be continuously expected in 2021–2030. National Highway 5 and National Highway 18 run parallel from Hanoi to Hai Phong and Quang Ninh province. Several large-scale industrial parks are located along these national highways, leading to heavy truck traffic. The completion of the Hai Phong–Hanoi Expressway partially reduced the heavy traffic. Developing more alternative routes by constructing new expressways is necessary to mitigate traffic congestion in the future. Promoting connections with the rail network will also facilitate more efficient cargo collection and delivery with the hinterland. Land use of industrial parks and logistics functions should be incorporated in the future development plan of Lach Huyen Port.

5.2 Recommendation for Japan

(1) Enhancing its international competitiveness

There are views to appreciate the detailed and technical studies in preparation for the project, the introduction of excellent technology to shorten the construction period, cost management, improve safety, and use the latest equipment. However, there is no doubt that there will be more tendency for the Vietnamese side to carry out the necessary works themselves, applying the technical skills they have acquired. Bearing in mind that some senior officials have said publicly that the port sector does not require ODA, it will be necessary for Japan to further improve its technical capabilities, modern management methods of ports, and other competitive approaches. Otherwise, it is extremely challenging to win projects

in international competitive bidding.

In order to strengthen competitiveness, it is even more important to formulate projects with a view to collaborate with local companies. At the same time, the strength of Japanese private sectors needs to be addressed such as cost, schedule, and safety management through technical application. Furthermore, indirect benefits such as the effect of promoting investment in the surrounding area, of Japanese companies needs to be articulated. Improving further skills of promotion and presentation is essential to address overall advantage of the projects implemented by Japanese companies and technology.

(2) Ongoing dialogue to ensure that factors impacting the business are addressed as soon as possible

The projects that also have a significant impact on the development of the surrounding infrastructure need to carefully follow the development plans of the target site and the surrounding provinces. Currently, the Lach Huyen Port has a proposal to extend its terminal, but there are plans to build other ports elsewhere as well. It would be an economic loss for the region, even the country as a whole if the existing Lach Huyen Port did not incur benefits. It is important to maintain close dialogues with the Vietnam side even if the port is already operational, for the review of any plans that may harm the port and cooperation on infrastructure development and other projects that will have a more synergistic effect on the expansion of the operation of the port.

ANNEX

1. Project Profile

Purpose

This project contributes to the economic growth and strengthens the international competitiveness of Viet Nam, as well as enhances cargo-handling capacity by constructing an international port with sufficient water depth and surrounding basic infrastructure.

The Lach Huyen Channel was opened in 2006, with a width of 100 m, a depth of 7 m, and a target vessel capacity of 20,000 DWT. The new route is 160 m wide, 14 m deep, and 17.4 km long and is designed to accommodate 100,000 DWT container ships that enter the international Lach Huyen port of. A 7.6 km-long sand barrier was also constructed along the route to prevent burial.

Output
1) Port Development- Component A
Construction of Port Terminal; Land reclamation and soil improvement. (Water depth of 14.0 m and two berths each with a length of 750 m)
Dredging channels and anchorage (channel depth is 14.0 m, width is 160 m, length is approximately 18 km)
Construction of Break Water (3,230 m), sand protection dyke (7,600 m), etc.
Construction of container yards, equipment, etc. simultaneously by private sectors – Component B
2) Bridge and Access Road-Component C (Motorways Tan Vu–Lach Huyen, including Dinh Vu Sea Bridge, at 16 m wide, connecting the port and Tan Vu Area by a 15.63 km-long road and bridge.
(Road is 10.19 km and bridge at 5.44 km with 4 lanes)
3) Consulting Service

2. Chronology of the Project

Year	Event
2003-2005	Seeking alternative port sites, pre-F/S, F/S from 2005 (by TEDI)
April 2007	Prime Minister Decision to announce the opening target as the year 2015
May 2007	MOT completed the F/S for the port part
2009	Port System Development Master Plan (2020-2030) (Decision No. 2190/QD-TTg/2009) Joint Venture for private investors is initially formed.
July 2009	MOT completed the F/S for access road and bridge
August 2009	JV submitted the proposal for PPP proposal to the Government of Japan, approved to apply for the PPP, and started the negotiation with the Government of Vietnam on the financial schemes up to the year 2015, METI Demand Survey for Lach Huyen Port
October 2009	JICA Preparatory Survey on Lach Huyen Port Infrastructure Construction (Port)
April 2010	JICA Preparatory Survey on Lach Huyen Port Infrastructure Construction (Road)
October 2010	Establishment of the Special Purpose Company (SPC) by Japanese investors
March 2011	JICA Detail Design Survey on Lach Huyen Port Infrastructure Construction (Port)~ March 2013

Year	Event
	MOT Decision, No. 476/ QD-BGTVT “on approval for adjustment of Hai Phong international gateway port construction investment project- Starting stage.”
August 2011	Decision No. 1741/QD-BGTVT, that designate the master plan of the north towards 2020 and 2030
October 2011	Joint Venture Agreement with Vietnam and Japanese companies
November 2011	Loan Agreement for Phase (I)
April 2013	Groundbreaking of Construction
December 2013	Discussion about the technical terms between MOT and Ambassador
March 2014	Loan Agreement for Phase (II)
May 2014	Groundbreaking for the Tan Vu–Lach Huyen Highway and Bridge
2015	Expressway between Hanoi and Haiphong (105 km) completed
December 2015	Loan Agreement for Phase (III)
May 2016	Groundbreaking for the Private portion
May 2017	Completion of Lach Huyen Bridge
July 2017	Typhoon July, September, Countermeasure of Soil Protection Dykes
September 2017	Partial opening of the Port and Bridge
November 2017	Completion of Reclamation, soil improvement, and bank protection
May 2018	Ground opening of Lach Huyen Port
June 2018	Approval of Design Change by MOT
August 2018	The depth of channel—14m was officially announced. Decision No.1191/QD-BGTVT
January 2019	Completion of Channels
April 2019	Formal inauguration after gantry crane started to operate
November 2019	Completion of the breakwater and sand protection dyke

Process Analysis of Effectiveness on Terminal 2 Construction Project in Noi Bai International Airport and Related Projects



February 2022

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Purpose of the Process Analysis

JICA conducts ex-post evaluations and publishes their results in order to ensure accountability to the public and extract lessons and improvements for similar projects in the future. However, the current ex-post evaluations focus on confirming the effectiveness (outcomes) of the project based on indicators. The process that directed (or did not) to the development of the project's effects is not always confirmed in detail, and the analysis of success and failure factors is not always sufficient. In light of this, we focused on the process as well as on the outcomes of the projects. In order to analyse and strengthen the process from this perspective, we have selected projects where useful lessons can be learned, and we have also conducted evaluations focusing on the "confirmation and analysis of the process of achieving effects." The purpose of this process analysis is to analyse and evaluate, from an ex-post point of view, how the effects were manifested, focusing on the implementation process at the time¹.

The "Terminal 2 Construction Project in Noi Bai International Airport (NIA)" (hereinafter "NIA T2 Project") is a project to construct a new terminal building for international passengers at Noi Bai International Airport (NIA) in Hanoi, the capital of Vietnam, in order to meet the rapidly increasing demand for air passengers and to improve convenience and safety. The project also aims to improve the convenience and safety of the airport. Nhat Tan Bridge Project (also known as the Vietnam-Japan Friendship Bridge, hereinafter "Nhat Tan Bridge Project") and Noi Bai International Airport to Nhat Tan Bridge Connecting Road² (hereinafter "Connecting Road Project"), which were also offered Japanese ODA loans concurrently, have enhanced transport capacity and dramatically improved access to NIA. The three projects have similarly contributed to the promotion of economic growth and the enhancement of international competitiveness, specifically the increase in foreign direct investment and the development of tourism and logistics. This has been demonstrated at the ex-post evaluation carried out in terms of relevance, efficiency, effectiveness or impact, and sustainability.³

In this process analysis, the development mechanism of the NIA T2 Project, as well as the synergy effect of completing the Nhat Tan Bridge and the Connecting Road at the same time was analysed. The analysis is based on the responses of the airport officials and consultants/contractors, the human resources development for the engineers and staff, and land acquisition, etc., and the process of completing these three projects and putting them into service simultaneously, as well as the soft cooperation in operating the airport terminal. The study also aims to provide recommendations for strengthening global competitiveness in the future.

The impact of the COVID-19 infections on the Study

The study was originally planned to start in 2020, but the COVID-19 outbreak limited the number of

¹As the results of this analysis are expected to provide useful insights for development practitioners working to solve similar development challenges, we have used the analytical framework of the Global Delivery Initiative (GDI), a platform for knowledge from the international development community, including international organisations.

While information presented in the report is based on a combination of project documents and these interviews, these findings do not represent the official views of the Government of Vietnam or JICA.

² It is named Vo Nguyen Zap Road after the national hero of Vietnam, Vo Nguyen Zap.

³ https://www2.jica.go.jp/en/evaluation/pdf/2019_VN13-P3_4_f.pdf

stakeholders that could be interviewed, which constrained the research. This was due to the following reasons

- The reduction of flights at international airports and the strengthening of waterfront measures.
- The fieldwork was postponed until May 2021, with last-minute changes to the quarantine protocol and the Vietnamese side refusing to allow interviews for being busy dealing with the pandemic
- Particularly, the working system in the office was affected when a staff member tested positive for the virus.
- The number of people to interview was limited since it had already been more than five years after the start of service, and many of those involved have already retired.

Due to these circumstances, it was decided to conduct on-line interviews with the former MOT leaders.

Under this circumstance, interviewing the persons in charge from relevant organisations was not accommodated. Alternatively, the information was collected by conducting several online interviews with the former senior officials. Since the head office is in Ho Chi Minh City, interviewing the Airports Corporation of Vietnam (ACV), which is the implementing agency of the NIA T2 Project, was done online. Contacting the Hanoi People's Committee, responsible for acquiring land for all three projects, was difficult, so any analysis or recommendations for site acquisition was not possible.

After the start of the field survey in Hanoi, it was possible to have face-to-face interviews with some of the MOT officials in charge of the NIA T2 Project, the Nhat Tan Bridge, and the Connecting Road between mid-June and mid-July 2021, when restrictions on domestic travel were somewhat relaxed. However, the plan to do the field survey twice and obtain feedback on the content of the surveys on the second occasion was not fulfilled. Some interviews were carried out remotely using online meetings. Within the constraints of the face-to-face research, additional information was collected by the national consultant for confirmation of collected data.

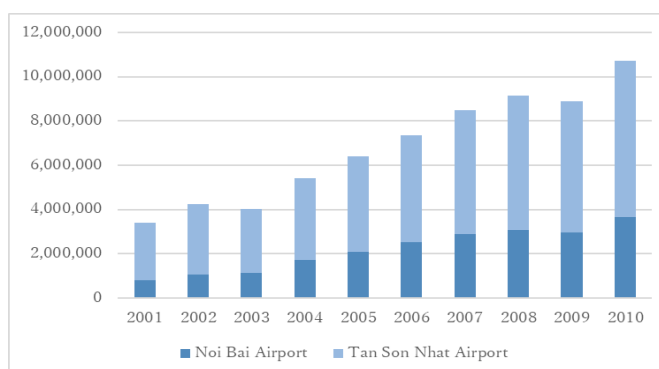
Introduction

On 4 January 2015, the grand opening ceremonies of NIA T2, Nhat Tan Bridge (or Japan-Vietnam Friendship Bridge, which is the largest cable-stayed bridge in Southeast Asia), and the Connecting Road between Noi Bai International Airport and Nhat Tan Bridge (Bo Nguyen Zap Road) were held in Hanoi. These three large-scale projects, with more than 70 % of the total cost of JPY183.1 billion or JPY131.6 billion, are being funded by Japanese ODA. The ceremony attendees include Mr. Nguyen Sinh Hung (Chairman of the National Assembly), Mr. Hoang Trung Hai (Deputy Prime Minister), Mr. Dinh La

Thang (Minister of Transport), Mr. Nguyen The Thao (Chairman of the Hanoi Municipal People's Committee), and others from the Vietnamese side, and Mr. Akihiro Ohta (former Minister of Land, Infrastructure and Transport) and Mr. Hiroshi Fukada (Ambassador of Japan to Vietnam). In 2015, Vietnam celebrated the 70th anniversary of its independence in 1945, the 40th anniversary of the end of the Vietnam War in 1975, and the 20th anniversary of the accession of Vietnam accession to ASEAN in 1995. It was also a very significant event for Vietnam as it symbolised the cooperation between Japan and Vietnam. Nearing the grand opening ceremonies, both Japanese and Vietnamese officials had worked tirelessly to complete the three projects at almost the same time.

In the 2000s, the economic growth of Vietnam was driven by the growth of exports and foreign investment, and to sustain this growth, it was necessary to develop a transport network that could meet the increasing demand for transport and rapid urbanization and contribute to smooth and safe logistics and mobility of people. There are 22 civilian airports in Vietnam, but three airports—NIA in Hanoi, Danang International Airport in Central Vietnam, and Tan Son Nhat International Airport in Ho Chi Minh City—accounted for about 89% of the total air passenger traffic in the country (2007). From 2001 to 2010, the number of international passengers at NIA increased at a rate of about 19% per year, while it was at 12% at Tan Son Nhat International Airport. By 2010, the number of international passengers at NIA was 3.675 million, which was much higher than expected. As shown in Figure 1, the increase at Noi Bai International Airport was rapid during that period.

The current Terminal 1 (T1) was put into service in 2001, and its capacity, which is six million passengers (both domestic and international) per year, was assumed would exceed by around 2010. In fact, the total number of domestic and international passengers handled by the passenger terminal building of NIA reached 9.52 million in 2010, already exceeding the planned capacity (6 million passengers per year). ACV needed NIA to expand its passenger handling facilities to cope with the further demand and to ensure convenience and safety as soon as possible.



Source: Civil Aviation Administration of Vietnam (CAAV)

Figure 1 Trend of the International Passengers of the Two Major International Airports in Vietnam

Before the implementation of this project, NIA was ranked below 200 in the World Airport Rankings.⁴ Having faced problems in facilities and services compared to other neighbouring countries, it also needed to reform and strengthen the relevant organizations in terms of operation and maintenance.



Noi Bai International Airport Terminal 2

The only access from NIA to Hanoi city centre was the existing North Thang Long–Noi Bai Road,⁵ but a survey in 2008 showed that the actual traffic volume exceeded the maximum capacity of the road. As the construction of the new terminal is expected to increase traffic even more, the main concern of MOT was to increase the transport capacity to avoid congestion. The construction of the Nhat Tan Bridge (Japan–Vietnam Friendship Bridge) as part of the Hanoi Ring Road No. 2 had already been signed as a ODA loan project in 2006, but a road directly from the Nhat Tan Bridge to NIA without going through the North Thang Long–Noi Bai Road is also important to improve access. Improving accessibility at the same time as constructing a new terminal, the construction of the "Noi Bai International Airport–Nhat Tan Bridge Connecting Road" (hereinafter "Connecting Road") has been decided and will be carried out with the aid of a ODA loan. MOT and others involved in the development of the international gateway of Hanoi have put great importance in the three projects as they are appropriate for the development.

The process from preparation to accomplishing results, i.e., analysis and clarification of the following aspects within the framework of the Delivery Challenge, is the purpose of this study.

1) How the technical cooperation (e.g., difficulties in setting up the Commissioning Preparatory Committee and the shared vision and strategy developed in the course of the discussions) contributed to realize an operation appropriate to the completed new terminal facility and the means and approach to achieve. What value has been derived from the technical cooperation carried out not only through the construction of the airport terminal facilities, but also for the operation of the airport and the introduction of new technical facilities, in particular, provided by the Japanese airport companies.

2) What trial and error led to the modification of the process: the NIA T2 project had to be put into operation upon completion without ample time to check; the Nhat Tan Bridge project faced a delay in acquiring land due to the relocation of residents of the planned pier site, etc.

3) In what ways have the results met or exceeded the expectations: e.g., the World Airport Rankings, impact of activities to improve customer satisfaction, etc.

4) Challenges and impediments to further promote economic growth and strengthen international competitiveness towards the development for the northern sub-centre, etc.

⁴ The World Airport Rankings is a customer satisfaction survey conducted by Skytrax based in the United Kingdom. More than 550 airports around the world are recognised as benchmarks of quality in terms of customer service, facilities, accessibility, and many other aspects. <https://www.worldairportawards.com/> (Confirmed December 2020).

⁵ The road passes over the Thang Long Bridge (a double-deck bridge with a four-lane motorway on the upper level and a double-track railway on the lower level), built with the support of the former Soviet Union and opened to traffic in 1985.

Based on the above points, lessons learned are drawn and concerns to further strengthen international competitiveness in the future are identified.

Chapter 1. The Outset of the NIA T2

The economic growth of Vietnam, driven by the growth of exports and foreign investment, has been on track, and to make this sustainable, it was necessary to develop a transport network that would accurately respond to the increasing demand for transport and rapid urbanization and contribute to smooth and safe logistics and mobility of people. The role of aviation is significant in the country, which has a long land area of 1,650 km from north to south, and in 2009, the number of passengers by rail and air were equal to approximately 11 million. On the other hand, in terms of passenger-kilometres⁶ transported, aviation has surpassed rail since 1996, which was when statistics became available.

In view of the importance of the aviation sector as described above, Japan initiated the support for a new international development plan for Hanoi as early as 1995. However, due to the fact that an air force facility was established on the north side of NIA and airport facilities were shared between the military and civilian sectors, the development of the airport by ODA was once cancelled. Consequently, the Vietnamese Government built the current Terminal 1 (T1) and its throughput was 6 million passengers per year. In 2004, JETRO conducted the "Feasibility Study on the Noi Bai International Airport Terminal 2 Project Feasibility Study (F/S)". It was confirmed with the MOT that the military use of the airport will be limited to training and the planned relocation of the military airport would be in accordance with the Vietnamese government policy. In 2007, the annual passenger throughput of T1 exceeded 6 million, and in 2010, reached 9.52 million.

There is an international market rate for the landing fees, and the airport charges collected from passengers are higher than the domestic price level, which makes it easier for capital investment with the assumption of long-term profitability. The commercial viability of the NIA T2 project under the OECD Export Credit Arrangement⁷. Based on the assumption that 85% of the project cost will be financed by Japanese banks and the rest by local banks in Vietnam, and using F/S data to analyse cash flow in various cases, it was concluded that it would be difficult to achieve a surplus in the first 10 years of operation and that the project would not be commercially viable. It was therefore decided to recommend that the project be implemented with highly concessional ODA loans.

Following the completion of construction of Tan Son Nhat International Airport Terminal (Ho Chi Minh City) in 2007 under the Japanese ODA Loan, the construction of NIA T2 was demanded to start as soon as possible in view of the increasing demand. Initially, the ACV officials stated that the project should start as soon as possible with the same design as Tan Son Nhat International Airport in Ho Chi Minh City. In addition, the ACV did not pursue to finalize the F/S under JICA funds since the procedure of the JICA and Vietnamese government aid offices was foreseen to take a long time. Subsequently, the ACV hired a Japanese

⁶ Cumulative number of passengers carried (passengers) multiplied by the distance travelled (kilometres) by each passenger.

⁷ A Gentlemen's Agreement, under the auspices of the OECD Board of Trade, setting out the common terms and conditions (minimum premium, down payment, maximum maturity, minimum interest rate and method of redemption) for the granting of official export credit for the export of goods and services with a maturity of two years or more. levels, down payments, maximum redemption periods, minimum lending rates and redemption methods, etc.) between the participating countries.

consultant company that had carried out the F/S study of Tan Son Nhat International Airport by their own fund. In 2009, ACV completed the acquisition of land for the construction of T2 and other preparations and signed the loan agreement.

Chapter 2. Technical assistance to Noi Bai International Airport

2.1 In-service preparatory committee for the establishment of an operations and maintenance (O&M) system

The strengths of Japanese airports include "know-how of airport O&M with a high overall quality in terms of punctuality, safety, cleanliness, eco-airport⁸ technology, etc."⁹ ACV, however, did not fully understand the values at that time. The preceding Tan Son Nhat International Airport had solely constructed a terminal. On the other hand, the MOT leaders enthusiastic about the development of the International Gateway Three Projects, i.e., the Nhat Tan Bridge, Connecting Road, and NIA T2, understood that it would not be a true infrastructure development project even if the infrastructure is complete unless it includes the quality of the soft side, the so-called service.

At the same time, the Japanese side also felt the need to improve the O&M technology for T2 in addition to conventional support of planning and construction for past airport projects financed by ODA loans. Therefore, the project support system with a wide range of participants, including airport companies, was established. In order to strengthen the terminal operation and management system, the Narita International Airport Corporation (NAA), with a proven track record in overseas projects and well-versed in airport operations, conducted a preparation study for the "Project for Support on Establishment of the Programs for O&M in NIA Technical Cooperation Project" in 2009–2010. The structure of the study is shown in Figure 2, which includes (i) the current status and issues of airport operation, (ii) the study on the profit improvement, (iii) the issues in O&M staff, (iv) the study on the establishment of operation and maintenance system of fuelling facilities, and (v) the study on the dispatch of experts for management and operation. This study provided a blueprint for the cooperation required in the five years leading up to the opening of T2.¹⁰

The project decided to install a Fuel Hydrant System (FHS), a fuelling system that uses underground pipes, and considered to introduce various data link systems, including a state-of-the-art passenger baggage handling system and a flight information system. A variety of data link systems were being considered. A high level of knowledge and know-how is also important for proper O&M of these systems. However, at the beginning of the project in 2010, the JICA Preparation Study revealed that the Northern Airports Corporation of Vietnam (NAC)¹¹ and its subsidiaries have insufficient knowledge, know-how, and experience. JICA and the Civil Aviation Bureau of the Ministry of Land, Infrastructure, Transport and Tourism

⁸ Airports that have implemented measures to promote environmental conservation and the creation of a positive environment at and around the airport. Ministry of Land, Infrastructure, Transport and Tourism (MLIT).

⁹ Website of the (MLIT), Japan.

¹⁰ This was the first in the airport support history of Japan that a scheme had taken airport operations into account, according to the MLIT.

¹¹ In 2016, it was merged with the southern and central airport companies to become ACV.

(MLIT) decided to provide continuous technical support until the commencement of service.

1. Preparation period in Japan 1-1. Grasp of the basic information of Noi Bai International Airport and existing information 1-2. Preparation of the operation implementation plan 1-3. Preparation for the presentation about Narita Airport			
2. Field survey 2-1. Submitted the implementation plan to the Northern Airports Corporation of Vietnam (now ACV) and interviewed them about the problems and requests. 2-2. Submitted and organized the documents such as the organization and operation rules of the NAC (Vietnam) 2-3. Confirmation of the detailed design of Terminal 2 2-4. Confirmation of the airport operation of Terminal 1 2-5. Submission of technical proposal for the maintenance and management system			
3. Overall Management 3-1 Analysis of the current situation and proposals for management and business planning 3-2 Analysis and proposal of the current situation of human resource management 3-3 Analysis and proposal of operation system 3-4 Current status analysis and proposal of maintenance management system	4. Survey of current status of airport operations and compilation of issues 4-1 Survey of the current status of airport operations 4-2 Survey of the current status of revenue and expenditure and fee structure, and proposals 4-3 Survey and proposals for outsourcing and related projects 4-4 Survey and proposal for cost reduction	5. survey on the current status of facility design and maintenance, and identification of issues 5-1 Survey of the scale and equipment of each facility 5-2 Survey of maintenance management system 5-3 Survey and proposal for spare parts management and maintenance records 5-4 . Proposal for sustainable maintenance management 5-5 Proposal for operation and risk management standards	6. Investigation of the current situation of the refueling system and arrangement of issues 6-1 Survey on the scale and system of fueling system 6-2 Investigation of the actual condition of maintenance management system 6-3 Investigation and proposal of safety management 6-4 Status of apron management

Source; JICA Study for Support on Establishment of the Programs for O&M in NIA

Figure 2 Overview of the 2009 survey provided a comprehensive picture of the operation of Noi Bai International Airport

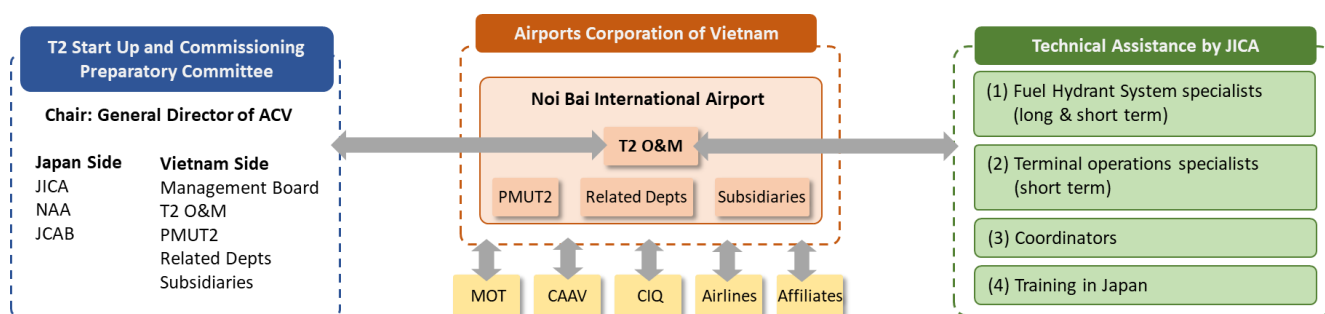
The following year of 2011, in the “Detailed Planning Study of the Project to Support the Development of the Operation and Maintenance Plan of Noi Bai International Airport,” the NAA-dispatched experts prepared a “To Do List” (of about 300 items, including the determination of the management concept, development of a medium-term business plan, conclusion of agreements and contracts with airlines and tenants, development of various operational plans, various training, setting appropriate airport charges, etc.) in chronological order, based on the comprehensive study of the existing terminal, and provided it to ACV.

However, due to differences between the countries, cultures, and laws, applying the items as they are is inappropriate. The ACV staff should initiate to modify and make them applicable in Vietnam. NAA felt that the preparation stage was the most difficult since the discussions had to start with explaining the importance of the respective items for the airport operations.

In addition, in order to enhance the effectiveness of the technical cooperation and to centrally manage the progress of the preparations for the launch of T2, the Japanese side proposed the establishment of the “T2 Commissioning Preparatory Committee” in November 2011, consisting of relevant organizations from Japan and Vietnam. Seven meetings of the T2 Preparatory Committee were held between April 2012 and June 2013¹². The benefits of lower operating costs and improved operations were understood early on, but

¹² Report by the Experts dispatched to support the management of the new terminal at Noi Bai International Airport

the benefits of improved management were less understood. Initially, the Vietnamese side seemed wary of Japanese interference in the management rights¹³.



Source: MLIT

Note: CIQ: Customs, Immigration, Quarantine

Figure 3 Noi Bai T2 Project Operation Preparation Framework

Table 1 The Major Technical Trainings Provided by the JICA

Period/ Provider	Contents
2011–2014	On-site training in Japan -Training on technical and policy issues by the Narita International Airport and Kansai International Airport
2012–2013 NAA	Dispatch of Experts for New Terminal Management Support (Short-Term) <ul style="list-style-type: none"> • Airport management and O&M management for terminal facilities and equipment • Institutional building for the new terminal facilities • Planning for the sound financial management, proper pricing policies, etc.
2012–2015	Dispatch of an Expert for Aviation Policy and Fuel System (Long-Term by MLIT)
2013–2014 NAA	Project for Support on Establishment of the Programs for O&M in NIA Technical Cooperation Project (Terminal Management) <ul style="list-style-type: none"> • Customer Satisfaction Improvement, Terminal Facility Management • Security Management, Terminal Operation Center • IT/Communication Equipment, Special Equipment/ Electricity, Manufacturing Facility
2014–2015 New Kansai International Airport Engineering Co., Ltd	Project for Support on Establishment of the Programs for O&M in NIA Technical Cooperation Project (Fuel Hydrant System) <ul style="list-style-type: none"> • Aircraft refuelling facility operation technology, Operational Inspection / Security, Monitoring Control System • Laboratory Quality Management and Electricity / Machinery O&M

Source: Documents provided by the JICA Experts

However, through the series of meetings and together with the training in Japan, the importance of technical assistance has been better understood. Under the meeting, a project operation preparation framework was set up as shown in Figure 3, and experts from Vietnam and Japan prepared for the launch

JICA/NAA, 2013.

¹³ From Interview with MLIT

of T2, mainly based on the experience of NAA. The issues discussed and proposed for training in this preparatory committee were not limited to technical training in IT, electrical and mechanical matters. They also included non-aeronautical revenue enhancement initiatives, customer satisfaction (CS), safety management and tenant management (Table 1). Among the many technical support items, the following sections describe the aircraft fuelling systems that have had the greatest impact, and the soft support, represented by CS.

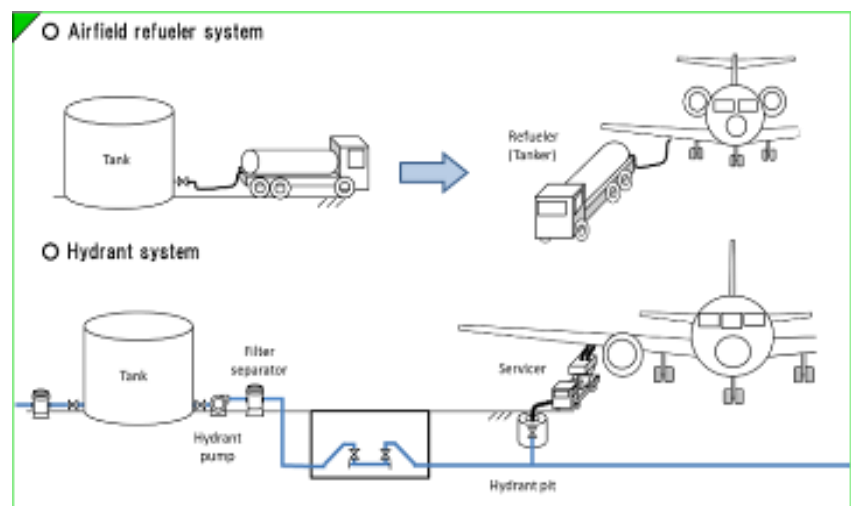
2.2 Introduction of state-of-the-art technology

The two types of aircraft fuelling systems are the airfield refueler system and hydrant fuelling system (FHS), as shown in Figure 4, which refuel aircraft directly via underground pipelines that run from newly constructed refuelling depots to the apron areas. T1 caused congestion at the apron during the peak flight hours, as fuelling larger aircrafts requires more than one refueler. The FHS introduced in the project first became operational in Vietnam. Initially, the Vietnamese side did not request it because of the high initial investment cost.¹⁴

However, having explained the revenue and safety benefits of FHS operation by elaborating the NAA as a case, ACV gradually understood advantage of the introduction, and made decision to introduce FHS. Affiliated engineers of the Noi Bai Aviation Fuel Service Company (NAFSC), established by the ACV with a joint investment from petroleum companies, were keen to learn the state-of-the-art fuelling techniques such as facility operation and safety control manuals, monitoring and supervision systems.

The experts for the operation of aircraft fuelling facilities dispatched by the MLIT from 2012 until the opening of the T2 provided technical advice comprehensively for preparing the terminal management and the refuelling facility operation management. The experts provided support for "stable supply, quality assurance and speed" in the refuelling service after the start of service to operate this system.

Furthermore, one year before the completion of the project facilities, there were concerns about the very tight schedule that would not allow operational training for the new facilities prior to the opening in



Source: Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Japan

Figure 4 Aircraft Refuelling Systems

¹⁴ Tan Son Nhat International Airport, completed in 2007, was the first airport in Vietnam with an FHS facility installed; however, its operations started in 2016, after the opening of Noi Bai Airport. The installed hydrant pipes could not function. The hydrant system is seen as similar to a water supply system but requires a high level of technology and operational skills. In other countries, there were cases of FHS that have had operational challenges and accidents. (FHS expert)

January 2015. In this context, the Vietnam Aviation Fuel Company (VINAPCO) suggested that if the refuelling facility at T2 would not be operational in time, the refuellers at the domestic terminal (T1) could be used at T2. However, accepting this proposal would have an impact on the income and expenditure of the FHS.

Consequently, JICA completed the “NIA Operation and Maintenance Planning Support Project (FHS)” a few months before the start of service. Experts from the New Kansai International Airport Engineering Co., Ltd. provided detailed training, and Vietnamese engineers received on-the-job training both in Japan and Vietnam. In addition, thanks to the advice of an inspector from the International Air Transport Association (IATA),¹⁵ NIA satisfied the stringent international standards for aviation fuel control by the International Fuel Quality Pool (IFQP) necessary for long-distance flights in December 2014, just prior to the opening of the airport. The implementation of these FHS and the process of gaining international approval were made possible by experts who had been sent to NIA to identify the issues in advance and coordinate with relevant authorities.

Since then, T2 has never applied the airfield refueler system used in T1. The application of FHS reduced the congestion of the apron and time for fuelling aircraft and substantially improved safety by avoiding the risk of refueler collision. The volume of fuelling jet oil increased significantly from 151,055 tons in 2015 to 364,285 tons in 2019, an increase of almost 1.5 times.

Furthermore, Japanese experts explained the difference of FHS operations between under direct management of the oil companies and airlines, which is common at Europe and the US airports, and under airport companies like in Japan. Finally, ACV applied the Japanese approach. NAFSC, an NIA affiliate, is in charge of the project, so refuelling fees are regularly paid to NIA, contributing to the stable financial management of the airport. ACV also appreciated that the project had been developed by a Japanese company under the Japanese Technology Transfer Program (STEP), using the experience of Japan in the introduction and operation of the FHS at Narita, Haneda, Chubu, and Kansai international airports, as well as its after-sales support.¹⁶ The first operation of the FHS in Vietnam resulted from the series of training conducted by Japanese airport companies after the dispatch of the jet fuel experts in 2012 and the multifaceted support from Japan, including consultations with the Japanese Petroleum Association.

Introducing FHS has a significant impact in creating a safe and quick refuelling environment capable of handling long-haul flights. In particular, NIA is expected to see an increase in long-haul cargo flights as the EU-Vietnam Free Trade Agreement (FTA) came into force in August 2020, which significantly improves the business environment for European companies in Vietnam.¹⁷

Besides FHS, Photocatalytic technology¹⁸ was also introduced for use in toilets to provide antibacterial and deodorising effects. Additionally, more baggage handling systems have been introduced than in T1, shortening the time to pick up checked-in baggage upon arrival.

¹⁵ Being affiliated to All Nippon Airways (ANA) and having regular flights to and from Hanoi made it easier to respond to requests for assistance.

¹⁶ JFE is in charge of the FHS facilities, and aftercare has been provided.

¹⁷ Decided about 99% of the tariffs would eventually be eliminated after a gradual diminishing period of up to 10 years.

¹⁸ A catalytic substance that promotes chemical reactions in the vicinity when exposed to light and has the power to decompose micro-organisms and oxides.

2.3 Technical support on management aspects, such as improving customer satisfaction (CS)

The leaders of the MOT, while appreciating the achievements of the Tan Son Nhat International Airport in Ho Chi Minh City (developed with ODA Loan), felt that the modernisation of the airport facilities only was not sufficient for a sophisticated airport for the capital city. A customer satisfaction (CS) expert from NAA was dispatched under the “NIA Operation and Maintenance Planning Support Project (Terminal Operation),” started in 2013, guided the introduction of the concept of CS in the airports of Vietnam for the first time. Several training courses were held in Vietnam and Japan, introducing the important concept of CS to enhance the competitiveness of airports, and simultaneously, how increasing non-aeronautical revenue contributes to the management of airports.

NAA provided the details of CS, such as the importance of a friendly attitude towards passengers, the introduction of accessible and culturally-inclusive design, and customer service surveys, which have not been discerned yet by the ACV staff (see photo below). At the airport entrance and exit, ponds were installed in the image of Hanoi with many lakes to give an impression of calmness. ACV also asked an artist to paint a lotus to provide an aesthetic effect. These are examples of creating a beautiful and friendly atmosphere.

The vision was to (i) improve the image of NIA among foreign and Vietnamese passengers, (ii) make the airport competitive in the region, and (iii) make the airport more attractive to passengers and airlines and increase non-airline revenue. The training by NAA promoted changes in every detail, from the method of staff training to airport cleaning.¹⁹ NAA's involvement in the CS training was not the first time at NIA, but one of the several training courses it conducted, such as in Egypt and other countries. In the case of NIA, NAA conducted a week-long training course solely on CS, which included recommendations on how to establish the organisation to conduct CS. Moreover, the training reflected the needs and current situation of the Vietnamese side. As a result, the awareness within ACV has changed; for example, they are seeking anything that can be improved immediately in T1 instead of waiting for T2 to be put into service.²⁰



Friendly attitude towards customers



Accessible design



Culturally-inspired airport design

Source: Narita International Airport Corporation.

Materials from Narita International Airport Corporation (NAA) used in JICA CS training

¹⁹ CS training materials provided by NAA.

²⁰ Based on the report of the NIA Operation and Maintenance Planning Support Project (Terminal Operation).



Stand with customer satisfaction survey sheets



Duty free and shopping area



The pond next to the terminal exit, with the lotus, Vietnam's national flower, painted on the wall.

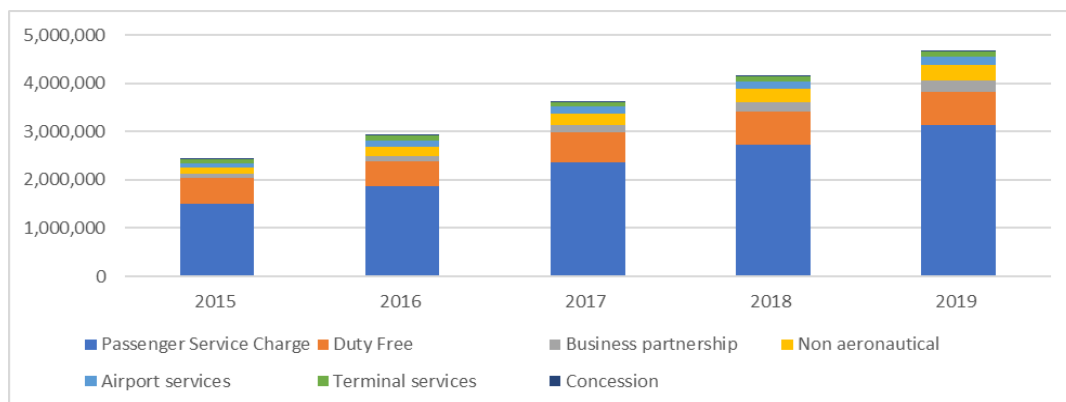
Source: JICA Ex-Post Evaluation Report, 2019.

Noi Bai International Airport Terminal 2

NAA experts explained to ACV the importance of diversifying and increasing non-aeronautical revenues to strengthen its financial position given the next expansion of its facilities, giving concrete examples of their management policies and know-how. For example, the experts advised on tenant management methods (setting rents linked to sales) and a wide range of tenant attraction strategies and reiterated that stable airport management would be ensured if the revenue from the sales of duty-free goods and various services increased more than the corresponding growth in passenger numbers. Duty-free and non-aeronautical revenue also grew steadily, as shown in Figure 5.

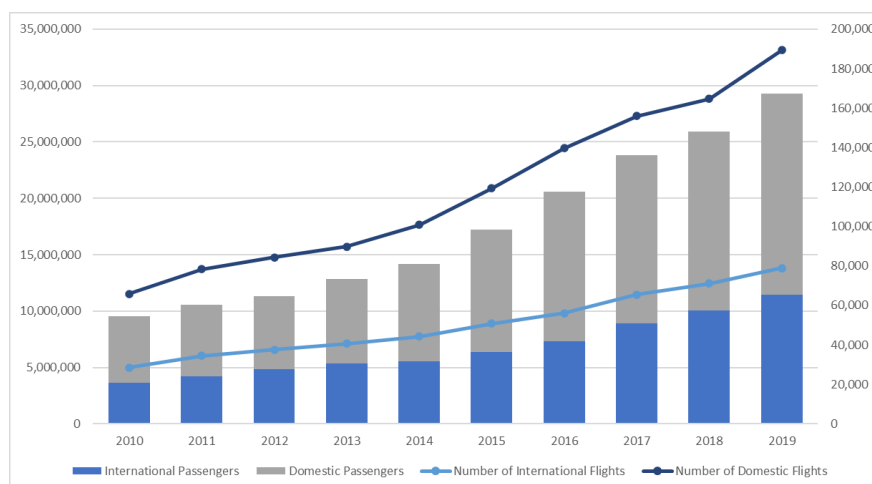
After the opening of T2, owing to the terminal improvements and partly to the consecutive CS training, the ranking of NIA at the World Airport Awards jumped to 82nd in 2016 from 218th in 2015. In the same year, it topped the World's Most Improved Airports. Since then, NIA has kept its ranking in the 80s range. No other airports in Vietnam have ranked within the 100 best airports since.

NIA T1 has increased its capacity by becoming the sole domestic terminal, which has led to a rapid growth in the number of domestic flights, as shown in Figure 6. From 2015 to 2019, international and domestic passenger numbers grew by an impressive 15.7% and 13.3%, respectively. The number of passengers reached its target ahead of schedule, and its performance exceeded demand forecasts, requiring immediate expansion.



Source: ACV Unit: million VND

Figure 5 The Revenue Sources of NIA T2



Source: ACV

Note: T1 built an annex for the Low-Cost Career Lobby in 2013, which also influenced the increase of the domestic flights.

Figure 6 Number of International and Domestic Passengers (Left Axis) and Flights (Right Axis) of the Noi Bai International Airport

2.4 Signing of an airport agreement between Airports Company of Vietnam (ACV) and Narita International Airport Corporation (NAA)

In the beginning, Japanese airport companies were allowed by Japanese law to engage in research and consulting services to support overseas infrastructure development as part of the ODA programme but were prohibited from overseas airport business. Through the participation in the NIA project, the significance of the NAA's international cooperation achievements, such as participating in the overseas airport project formation studies and airport consulting services, has been widely acknowledged. It also contributes to the efficient management and operation of the NAA itself. In 2018, the "Law on the Promotion of Japanese Companies' Participation in Overseas Social Infrastructure Projects" came into force, making overseas airport projects a core business of the NAA.²¹

ACV and NAA signed an Airport-to-Airport Agreement in 2017 in recognition of the intermittent and long-term support provided to NIA since 2009, among other things. Consequently, even after the completion of the NIA T2 project, CS training sessions were held in Hanoi in 2017 and Narita in 2018. As further technical support, training sessions on runway civil engineering, pavement, aviation lights, etc. were held in Narita in 2019.²²

²¹ <https://www.naa.jp/jp/b2b/business/expertise/index.html>. Accessed September 2021.

²² Interviews with NAA (April 2020 and April 2021). Subsequently, NAA has signed contracts for operational cooperation in the expansion projects of New Ulaanbaatar International Airport in Mongolia (investment in New Ulaanbaatar International Airport Co., Ltd. in 2019) and U-Tapao Airport in Thailand (2020).

Chapter 3. Towards the grand opening ceremony for the three international gateway projects

3.1 Coordination of the construction schedule with Nhat Tan Bridge and the Connecting Road

The loan agreement for Nhat Tan Bridge (Japan-Vietnam Friendship Bridge) was signed in 2006 to build a bridge across the Red River in Hanoi to meet the increasing traffic demand. The project was also intended to commemorate the 1,000th anniversary of the transfer of the capital to Hanoi in 2010. Initially, it was planned to connect to the existing National Highway 3 to access Noi Bai Airport, but after the decision to build NIA T2, a connecting road between Nhat Tan Bridge and the airport was also recognized important to shorten the access time. MOT leaders themselves directly studied the right of way for the road and planned the Connecting Road from the Ring Road 2 and Nhat Tan Bridge to Noi Bai Airport in the shortest possible distance. The projects of NIA T2, Nhat Tan Bridge and the Connecting Road were designated as the three international gateway projects (Figure 7).²³

The Ministry of Defence, Hanoi People's Committee, and the MOT, which owned most of the official land on the stretch of road connecting Nhat Tan Bridge to NIA and drawn up the plan, all agreed that improving accessibility was important. They also decided on the alignment of a new high standard road, with three lanes in each direction rather than connecting to the existing National Highway 3, giving impact on more residents. While many projects require time to coordinate the opinions of relevant authorities, it did not take long to reach a consensus on the significance of building the shortest possible route from the airport to the city.²⁴ In addition, it was decided to ensure the surrounding communes would not be divided by building underpasses, etc., and a side road would be constructed parallel to the main road.

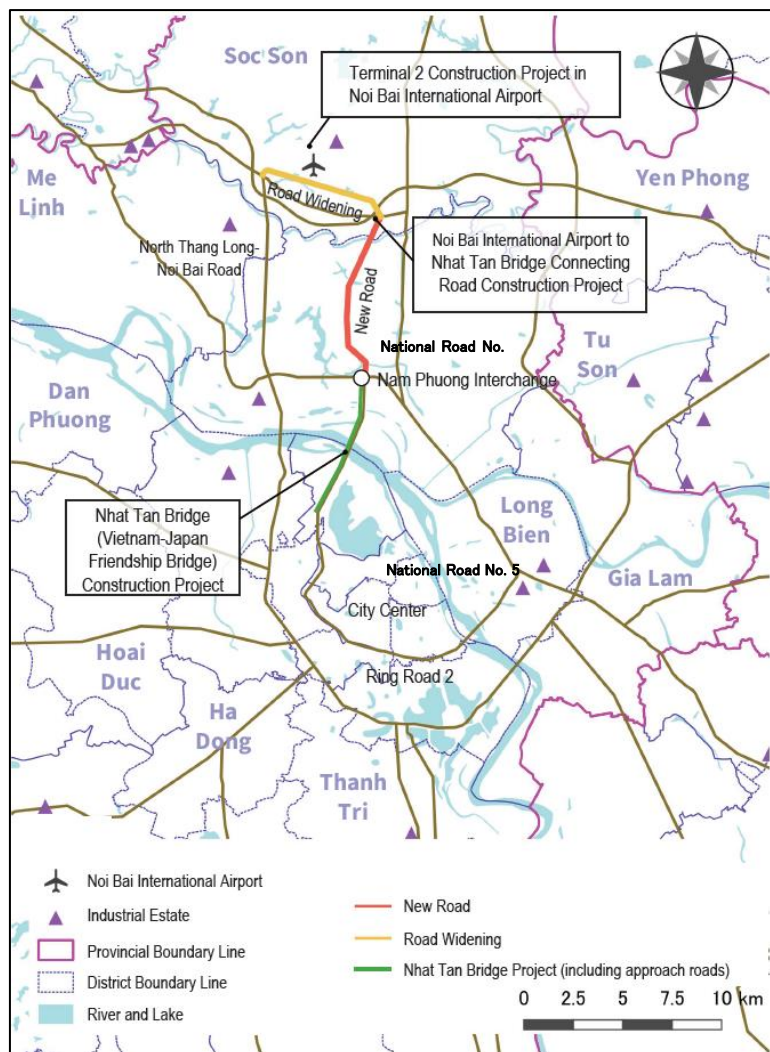
However, it was likely that the completion of the Nhat Tan Bridge would be postponed by approximately two years from the planned date of 2012 since it took longer than expected to acquire the land for the proposed site and relocate the locals. As mentioned in the introduction, 2015 would be a milestone year, such as the 70th anniversary of Vietnam's independence. The leaders back in 2015 wanted to celebrate the inauguration of the three projects at the same time. On the other hand, the construction of the Connecting Road was also delayed. Like with Nhat Tan Bridge, the acquisition of land took a long time. Moreover, the Connecting Road Project was divided into five different packages, represented by Vietnamese, Korean, or Chinese contractors. Some packages could not manage the subcontractors efficiently, which led to substantial delays.

The implementing agency for the Nhat Tan Bridge and Connecting Road was MOT, and under MOT is the Project Management Unit 85 (PMU 85) that is directly responsible for the procurement to the construction of projects. PMU 85, responsible for many ODA loan projects in the past, was upset by the delays of the subcontractors. Subsequently, the Minister of Transport instructed to replace the subcontractors in order to achieve the joint grand opening ceremony in early 2015²⁵.

²³ The Nhat Tan Bridge Project was delayed due to the involuntary resettlement procedure, and the completion of the construction of the NIA T2 and the Connecting Road were scheduled to coincide with the completion of The Nhat Tan Bridge Project.

²⁴ Based on the discussion with former MOT officials.

²⁵ From interview with PMU85



Source: JICA Evaluation Team, based on the existing maps.

Figure 7 Location Map of the Projects with Existing Road Network in Hanoi City

Other problems, in addition to that with the subcontractors, include the revised design of the connection with the road in front of the airport and the road-widening by a Vietnamese company. The road-widening was under a separate contract that did not proceed as planned and blocked the passage of vehicles for the construction of the terminal. Coordination between PMU 85 and ACV was supervised by the JICA office. Schedule management was a critical matter as well.



Nhat Tan Bridge and Connecting Road

3.2 Responding to requests for accelerated T2 completion

Regarding the NIA T2 construction, the contractor Taisei Corporation had worked hard to comply with the 34-month construction period on time while responding to repeated requests for design changes. It coped with the minor changes and causes for delay.²⁶ According to the contractor, approximately 3,000 Vietnamese engineers and workers were employed during the peak period of around one year. About 120 Japanese engineers and engineers who had worked at Qatar Airport in the Middle East were also dispatched to carry out the work. There were about 20 local subcontractors.

The Japanese contractor had a hard time ensuring the quality, process, and safety standards were strictly adhered to because the awareness of the local workers was different from that in Japan²⁷. However, it was in the best interest of the local company to follow the policies of the Japanese contractor, including the safety management system. Both the construction consultant and contractor were regarded as sincere and professional in their approach²⁸. In addition, as the site was acquired for a residents' cemetery, ACV has been organising local charity events both during and after construction, as it considers it important to cooperate with local residents and build consensus with the local communities

Normally, there is a four- to six-month period of familiarisation with airport operations after completing the construction work and before the opening of the new airport. The project was planned for completion in December 2014 and opening in April 2015 or later. However, about six months before the completion, the Vietnamese government made an unusual request for the full opening of the airport, only the day after the construction was handed over, in order to cope with the rapid increase in passenger demand. Meaning, the building construction and operations testing with the airlines had to be done in parallel, and the tenants had to be brought in ahead of schedule. The contractor had to prepare for the risk of the baggage handling system not working as T1 had no experience with automated systems. The ACV was also generous enough to accept that some tenants could not open their businesses in time. Finally, this request was fulfilled, and a joint grand opening ceremony was held in January 2015 with the three projects. For the joint ceremony to be possible, PMU 85 and ACV, which are in charge of the respective projects, had frequent progress meetings with the MOT to overcome the challenges they faced.

3.3 Project costs and repayments

There were criticisms from the Vietnamese side about the relatively high cost of NIA T2 due to a single bidder for construction. However, there is a clear difference in the cost of financing between STEP's low-interest rate financing and that of commercial banks and government bonds. In other words, assuming that the repayment amount of Vietnamese government bonds is 5% interest per annum (at that time) with a redemption period is 30 years and interest rate of STEP is 0.1-0.2% with a grace period of 10 years and the repayment period is 30 years, the total repayment amount is about 60% lower with STEP than

²⁶ The construction period of 34 months was the same as the preceding Tan Son Nhat International Airport project, but the work itself was about 1.5 times larger and therefore more demanding.

²⁷ One of the example is to raise awareness of schedule compliance.

²⁸ Survey on Construction Safety ACV, JICA 2012

government bonds.²⁹ Not many complaints have been expressed from the senior management of ACV, including about the financial benefits of the ODA loan and the benefits of the substantial technical assistance granted by JICA. Rather, they focused on the increased revenue from NIA by opening the airport even a single day earlier and increasing the number of flights.³⁰

Chapter 4. Remarkable achievements and pending issues

4.1 Synergy effects of the three projects

The construction works of NIA T2, the Nhat Tan Bridge, and the Connecting Road are in line with the development policy and needs of Vietnam and the Japanese aid policy to support the development of international airports and urban ring road networks as gateways for economic growth (tourism, logistics, etc.). In order to respond to the increasing demand for air transportation, the NIA T2 project has provided facilities that can accommodate 15 million passengers per year and O&M has been carried out without any problems. The project has brought economic benefits to Hanoi in particular, such as shortened travel time from the centre of Hanoi to NIA via Nhat Tan Bridge and the Connecting Road, reducing traffic congestion and improving logistics efficiency, and to Vietnam in general .

If the Nhat Tan Bridge has not started operations simultaneously with NIA T2, the existing Thang Long Bridge³¹ is the only available route to the city centre from NIA. The Nhat Tan Bridge contributed not only to the travel speed and time to NIA but also to the development of the urban ring road network. Both projects have not only connected NIA with the city centre, industrial estates, and logistics centres but also improved access to other provinces. The traffic congestion on Thang Long Bridge to reach the city centre from NIA, which took 60–90 minutes in 2011, has been significantly reduced to 16–22 minutes in 2020 using Nhat Tan Bridge and the Connecting Road. The annual benefit of the Nhat Tan Bridge is estimated to be about VND1,816.2 billion (about US\$9.1 billion), and the reduction of travel costs is about VND2,595.2 billion (about US\$13 billion)³².

The land freight volume in Hanoi has shown a steady increase since 2014, and according to the interview with the logistics industry, the logistics volume to and from NIA has increased by 11.4% per annum since 2015. Similarly, in terms of the linkage from central Hanoi to the northern provinces, the two projects have connected National Highway 3, the east–west Noi Bai–Ha Long Line, Hanoi–Lao Cai Expressway, National Highway 2, and National Highway 18, which connect central Hanoi to the north of Vietnam. The respondents said that the road network to the north of Hanoi has improved. Expanding the transport network and new investments have played an important role in the growth of the logistics industry as new companies have started to lease land to build facilities and logistics centres targeting the northern region of Hanoi.

²⁹ JICA materials (ODA to Vietnam, JICA's vision, challenges in the field, future prospects).

³⁰ Interview with ACV on June 2021.

³¹ It was built in 1985 with the support of the former Soviet Union. For more information on the bridge, see the Annex.

³² Ex Post Evaluation report of JICA in 2019 (The conversion rate is 1VND=0.05015yen)

4.2 Progress in Development of North Hanoi

The construction of the Nhat Tan Bridge and the Connecting Road, together with the construction of the NIA T2, has made the development potential of northern Hanoi more realistic. With the concentration of population in Hanoi, the area to the west of the Red River, which divides the city into two parts, has been gradually expanding, while the urbanisation of the northern part of Hanoi (the location of NIA), to the east of the Red River, has been a key target as potential sub-centre in the Hanoi Urban Master Plan of 2011. The Nhat Tan Bridge and the Connecting Road have increased the accessibility to the city centre from the east side of the Red River, which is as important, if not more, as the improved access to the airport.

Hanoi City recognizes the importance of developing the area near the Nampom Interchange, National Highway 5, and Nhat Tan Bridge to the Connecting Road, as shown in Figure 8, including the development of the sub-centre, due to the need to promote the planned urban development. There are already plans for development along the Connecting Road between NIA and Nhat Tan Bridge, such as housing, entertainment facilities, and business complexes, involving several Vietnamese private companies and the Japanese company Sumitomo Corporation (Figure 9)³³.

Sumitomo Corporation and BRG Group, one of Vietnam's largest local real estate companies, are working together to develop a smart city at the location shown in number 1 of Figure 8. It is a 272-ha development project led by the private sector, with the first phase starting in 2019³⁴. The project is located along the Connecting Road, which connects NIA to the centre of Hanoi and is also expected to connect to the Hanoi Urban Railway Line 2. The project is a forerunner of private sector-led development in line with the Vietnamese Government's guidelines for smart city development in 2018. Land acquisition and project planning have been completed, with the first phase aiming to create a sub-centre with a population of around 20,000 and a final working population of 200,000. The project is designed to incorporate smart technology in six areas: energy, transport, administration, education, business, and daily life, and at the same time, aims to improve the motorbike society and air pollution, leading to the sustainable development of Hanoi.³⁵

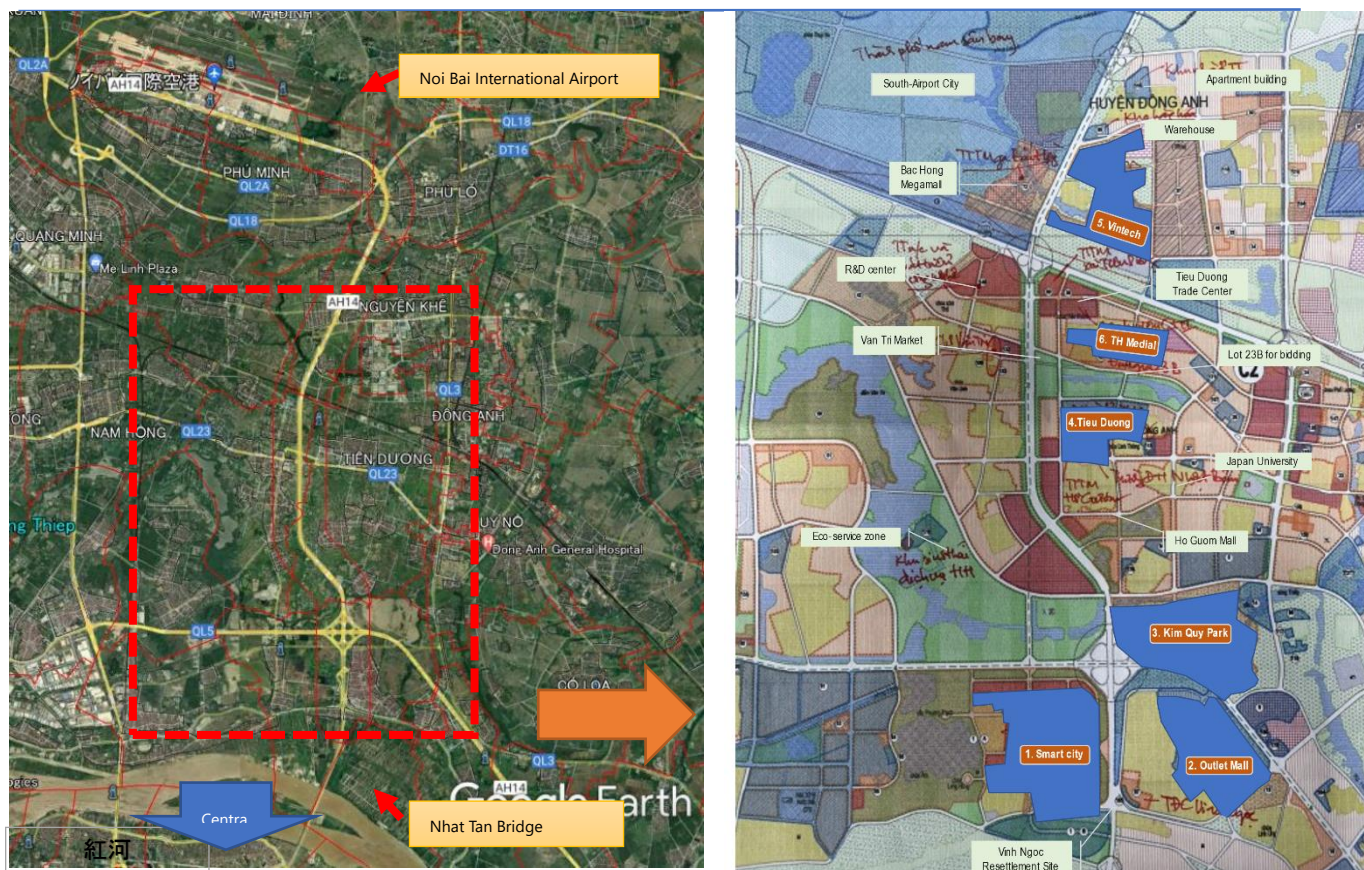
In the past, most of the land along the Connecting Road in the northern part of Hanoi was farmland, but it is expected that many of the former farmers will continue to find jobs in the service industry to improve their livelihoods. Gradually, the area will turn to be a sub-centre. These developments would not have been possible if the Nhat Tan Bridge had been a stand-alone project. The timely decision between Japan and Vietnam to build a road connecting NIA and Nhat Tan Bridge as an integrated international gateway projects made it possible to complete the three projects simultaneously in 2015 and trigger the development of the surrounding area.³⁶ The three international gateway projects have also created an environment for the urbanisation of northern Hanoi.

³³ Relevant documents of Hanoi City

³⁴ Construction of the first phase was planned to start in 2021 but COVID-19 caused delay.

³⁵ North Hanoi Smart City development project from Sumitomo Corporation 2020 data.

³⁶ Interview with MOT and Hanoi City.



Source ; Compiled from Hanoi city data and Google maps

Note: The following plans was presented by the City of Hanoi

1. North Hanoi Smart City by Sumitomo Corporation (mixed-use urban development project by Sumitomo Corporation)
2. Kim Quy Park (recreational facilities by Sun Group)
3. Tieu Duong Social Housing (Green Link City) (housing development by Viglacera and Hoang Thanh)
4. Vintech Park (business complex by Vin Group)

Figure 8 Proposed development plan along the northern Connecting Road in Hanoi



Source: Sumitomo Corporation

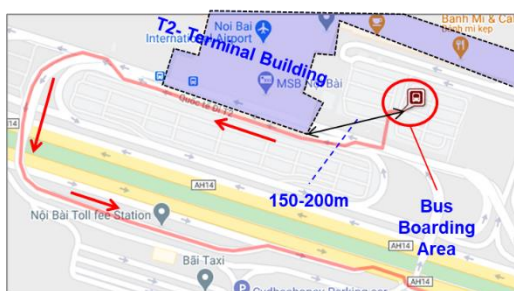
Figure 9 Image of the North Hanoi Smart City development

4.3 Challenges after CS training

CS training has improved the service aspect of NIA on the soft side. However, there are still some

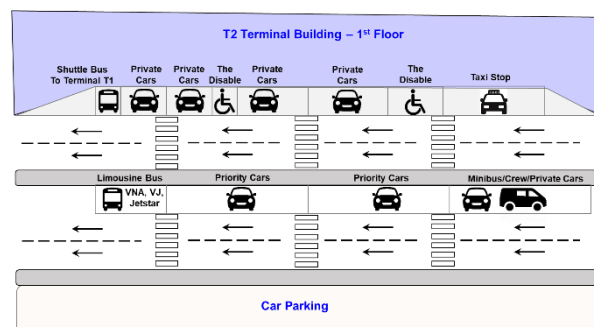
shortcomings in terms of actually improving the service in response to customer feedback. Congestion on the roads in front of the airport has been the norm before 2020. Users have pointed out that taxis dispatched by an app are congesting the area around the car park. Subsequently, it is inconvenient for passengers to move to the domestic terminal.

Users have particularly indicated the inconvenience of getting on and off the bus and that it should be improved as soon as possible. At present, users of the two high-fare bus routes can get on and off at the terminal exit, but users of the other four routes have to walk around 150–200m or more from the exit on an uncovered road (Figure 10). As shown in Figure 11, the area around the exit is occupied by private vehicles, taxis, and shuttle buses heading to T1 of the domestic terminal with no consideration to the convenience of ordinary bus users. However, ACV has no plans to improve in this respect in the short term. Since these are caused by financial or technical constraints, failure to respond to customer needs is a concern from the point of view of CS. CS training was a key request from senior transport officials who requested to introduce appropriate customer service to modern infrastructure, which NAA has repeatedly provided. This issue illustrates how difficult it is to apply and sustain CS. Customer requirements need to be incorporated in further opportunities for terminal expansion.



Source : Drafted based on the Google Maps

Figure 10 Bus No. 7 stop



Source : Author

Figure 11 T2 Ground floor boarding area

Chapter 5. Values and lessons learned - Human Resource & Organizational capacity

(1) Establishment of an appropriate management system through "packaged infrastructure support" that provides both hardware and software support³⁷

Not only was the provision of terminals and fuel supply facilities made possible with the cooperation of Japanese airport companies, but also the combined multifaceted technical assistance aimed for sophisticated operation and increased added value. This is a good example of "packaged infrastructure support," in which Japanese technology and know-how are used to provide integrated and comprehensive cooperation in terms of both hardware and software.

At the start of the operation of the project, the Japanese officials advised the ACV on the proper operations of the aircraft and facilities and provided training to improve CS, and strategies to increase non-

³⁷ Project Design, Human Resource & Organizational capacity (Skill Transfer) are applied in Delivery Challenges under GDI.

aeronautical revenues. These multiple results were based on the close consultation between the Japanese and Vietnamese airport companies and officials in the preparatory committee for the service during the implementation of the project. It shows how important strategic preparation is to enhance the results of infrastructure development as well as the effectiveness of implementing soft technical cooperation alongside main construction work.

In addition, NAA, which played a central role in providing technical assistance, has been in regular discussions with ACV even after the inauguration. In 2017, NAA also signed an inter-airport agreement. The Japanese and Vietnamese sides continue to strengthen strategic cooperation, promote tourism, and cooperate on technical matters. The consistent involvement of the Japanese side has led to the development of business in the medium- to long-term and the sustainable development of this project.

Support for the airport sector, including multifaceted technical assistance as well as management improvements, as done in this NIA T2 project, has never been performed in other projects. It was only possible by the fact that immediately after the decision to implement the project, the Vietnamese side had a common understanding that mere provision of facilities was insufficient, owing to the initiative of the Japanese side. The technical support by Japanese airport companies provided from the beginning of the project is the asset apart from the preparation of the construction work in addition to know-how and experiences as well as technology transfer from Japan side. The significant lessons learnt from this project includes how to assess the existing conditions appropriately, and management capacity of infrastructure and terminal operation based on advanced and modern internationally standards

(2) Introduction of FHS, that operation ensured by Japan's multi-layered technical support³⁸

The FHS, which is the main technical feature of the project, is a refuelling system for aircraft directly from newly constructed refuelling tanks to the aircraft tarmac via pipes buried underground. The system contributes to shortening refuelling times and safety on long-distance flights. Although the equipment was provided to Tan Son Nhat Airport, also constructed with an ODA loan before the NIA T2 project, it had not been immediately operated after project completion, making both Japan and Vietnam recognize the importance of the technical support. In addition to the long-term experts dispatched by MLIT and Narita International Airport Corporation (NAA), support from the New Kansai International Airport Engineering was also granted. The fact that the operator of FHS is an affiliate of NIA, not an oil company or an airline company, has been appreciated by ACV as the revenue stream has increased and after-sales service of the system has been provided for by a Japanese company.

(3) Responding to the Vietnamese side's strong commitment to simultaneous completion³⁹

The airport, bridge, and road projects were constructed simultaneously, and stakeholders were mainly the transport ministries and airport companies of both countries, so there was no need for coordination with multiple stakeholders nor multiple approvals of local governments other than Hanoi City. Nhat Tan

³⁸ Skill Transfer, are applied in Delivery Challenges under GDI.

³⁹ Commitment & Leadership, Coordination & Engagement, Project Design (Time Allocation) are applied in Delivery Challenges under GDI.

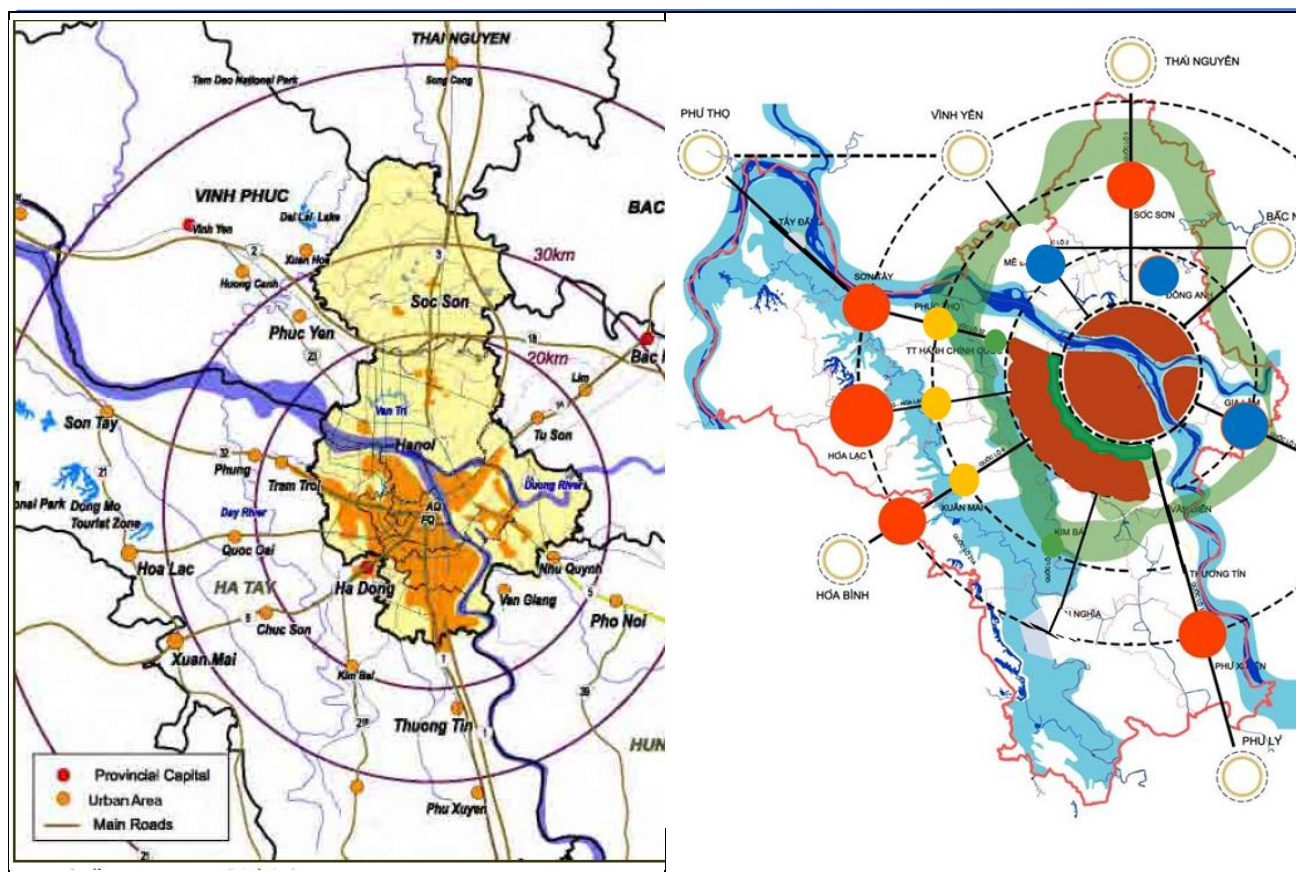
Bridge and the Connecting Road, on the other hand, required substantial land acquisition that posed the risk of delays. However, the Vietnamese side set a clear target to hold a grand opening ceremony in January 2015, and the project was overwhelmed by the leadership of the Vietnamese side, including the City of Hanoi, the MOT, and the Deputy Prime Minister, and especially by the strong commitment of the top management of the relevant agencies. The Japanese consultants and contractors also understood the significance of the simultaneous completion of the projects, and in order to meet the strong wishes of the Vietnamese side, they adjusted the schedule and made every effort to ensure safety management to avoid any delays due to accidents, and prepared for the completion and opening of the project. The Japanese consultants and contractors were highly appreciated for their time management skills, which prevented major delays in the overall schedule.

(4) Simultaneous completion of the three projects that encouraged interest from the business community and the promotion of a number of development plans⁴⁰

In Figure 12, the yellow-highlighted area on the left, west of the Red River, was the only urban area in Hanoi until 2007. Later, in 2008, Hanoi expanded its urban area by merging some of the surrounding provinces, Ha Tay and Bin Phouc partially, as shown in the orange borderline on the right. In the development master plan of Hanoi, it indicates that Soc Son district in the north of the city centre where NIA is located, Nhat Tan Bridge, and Dong Anh district around the Connecting Road will be further urbanized in the future, as shown on the image on the right in Figure 12. However, the urbanisation of this area has been slow due to its inaccessibility being divided by the Red River. In January 2015, when this project launched, the Nhat Tan Bridge was provided that connects to the city, increasing the convenience of the northern part of Hanoi. Reaching NIA back in 2011 took 60–90 minutes, but since 2020 using Nhat Tan Bridge and the Connecting Road, it only takes 16–22 minutes. This is significant. It is easy to imagine the congestion in Hanoi would be worse without the Nhat Tan Bridge. The number of vehicles accessing NIA would increase rapidly due to the growing demand for air travel.

The fact that the Connecting Road was not an old road (connecting to National Highway 3) but a new one, and the fact that this project, the Nhat Tan Bridge and the Connecting Road, were put into service at the same time, is significant. Improving access between the international airport and the city centre attracted the interest of the business community and had a direct effect on the many development projects proposed along the Connecting Road. In addition, the development of the surrounding area has led to the proposal of a smart city by Japanese companies in collaboration with Vietnamese companies, laying a solid foundation for the development of a sub-centre in the north direction, which has been a longstanding issue for Hanoi.

⁴⁰ Coordination, Engagement are applied in Delivery Challenges under GDI.



Source: JICA Comprehensive Urban Development Programme in Hanoi Capital City (HAIDEP) 2007

Source: Hanoi General Construction Plan 2011

Figure 12 Urbanisation status of Hanoi in 2007 and the strategic development areas identified in the 2011 Hanoi Master Plan Strategic development areas

Chapter 6 Future challenges and recommendations

There are examples of large-scale commercial and business complexes and other facilities developments, known as airport cities, alongside airports, such as the Haneda, Tokyo International Airports. The surrounding area of airports can potentially become a hub for economic development. For a long time, the area between NIA and Hanoi city centre has only been a transit point and farmland. However, after the three projects were put into service, they promoted rapid changes, with large development plans being prepared. It is envisaged that the provision of sub-centres and comfortable residential areas will be realised in stages once the smart city plan for the north is practiced.

On the other hand, there is a possibility for the accommodation facilities, restaurant businesses, and residents to increase in the vicinity of NIA, and it is feared that if zoning (residential and commercial) is not properly carried out, issues such as noise problems may arise in the future. There is an urgent need to coordinate the land acquisition for Urban Railway Line 2, which is planned to be extended to terminate at the airport⁴¹ in anticipation of increased traffic demand due to future large-scale development in the area.

⁴¹ Data Collection Survey for Hanoi Metro Line 2 Extension North, JICA 2020.

The ACV is currently working with the Paris Airports Authority on a master plan for the future extension of T2 to include T3. Major land acquisition is required. In order to expand the business opportunities and develop the sub-centre of NIA, it is necessary to quickly coordinate with the Hanoi People's Committee, the MRB, and the ACV for the expansion of the airport. It is also necessary to strengthen the process of land acquisition and zoning to limit uncontrolled development in the future.

The infrastructure development of NIA, a combination of roads and bridges appropriate for the international gateway of the capital of Vietnam, has been achieved through the combined efforts of the Japanese and Vietnamese parties. The improved accessibility and the increased development potential of the surrounding land will continue to be inherited and further developed. Therefore, a concerted effort by all parties is a prerequisite.

Japan and Vietnam leaders had a broad concept of the development of an international gateway. Rather than looking at it as three independent projects, such as an airport, a road, and a bridge, it is looking at realizing the development of a sub-centre in Hanoi in the future through peripheral development and a railway line that connects the CBD with NIA. The people involved in the projects were able to envisage and share the direction of the future development of the north of the capital city comprehensively rather than just the formation of individual projects. That ensured that the project could be brought into service concurrently, which was expectedly a challenge. Finally, this materialized broad and significant impacts.

The MOT official at the time who was directly involved in the three projects said that every time he arrived at the airport, he would feel proud of the terminal, the quality of the access road, and the symbolic Nhat Tan Bridge, which was the gateway to the country. In order to promote the development of the northern part of Hanoi and strengthen its international competitiveness, the three projects were positioned as three international gateway projects which together form the image of Hanoi Capital City in the eyes of foreigners.

Annex

1 Project Profile

	NIA T2 Project	Nhat Tan Bridge	Connecting Road
1) Objectives	To respond appropriately to the sharp rise in air passenger demand and enhance convenience and safety by building a second passenger terminal for the use of international passengers at Noi Bai International Airport in Vietnam's capital, Hanoi, thereby contributing to the promotion of Vietnam's economic growth and its international competitiveness.	To respond to the increased transport demand, streamline logistics and alleviate traffic congestion by constructing a bridge over the Red River and the Connecting Road to Hanoi City Centre, thereby contributing to promotion of economic development of Hanoi City and the northern regions of Vietnam and the strengthening of international competitiveness.	
2) Beneficiaries	ACV, Airport users (passengers and airlines)	Airport users, Drivers, logistics companies	
3) Project Schedule	March 2010 (L/A) ~ December 2016	March, 2006 (L/A) ~ December 2016	March 2010 (L/A) ~ June 2017
4) Project components	Construction of Airport Terminal, Technical Assistance for Terminal Management, Fuel Hydrant System, etc.	Construction of the bridge and highway Cable-stayed bridge with five main towers	
5) Project Cost (of which ODA Loan)	67,671 Million Yen, 55,246 Million Yen (Project cost for Technical Assistance: -Not available)	62,640 Million Yen (48,278 Million Yen)	24,168 Million Yen (16,350 Million Yen)

2 Project Chronology

Year	Event
1960s	Construction of an airport in Soc Son district, 22 km north of the capital Hanoi, as a military airfield. In January 1978, NIA opened
2001年	T1 was constructed with the capacity of 6 million passengers per year, operated by the NAC
2003	Hanoi Transport Master Plan by 2020、 Aviation Sector MP (2020-2030) F/S for the Nhat Tan Bridge by Transport Engineering Design Incorporated (TEDI)
March 2005	The F/S for NIA T2 by Itochu Corporation under METI
August 2005	F/S for Nhat Tan Bridge Completed and EIA report was approved by MONRE.
2006	Land acquisition delayed and completed up to 2013, which lead to the delay of the overall schedule.

Year	Event
July 2007	Completion of Tan Son Nhat Airport
March 2008	Adjustment of Master Plan of Noi Bai Airport (CAAV)
October 2008	Vice Minister Hai and JICA Chief Representative discussed the possibility for financing NIA T2 by Japan ODA loan.
April 2009	Completion of Land acquisition for NIA 2.
May 2009	Supplemental F/S for NIA T2 financed by NAC completed. Basic Design was also funded by NAC to accelerate the preparation.
October 2009	Study for Establishment of the O&M Institution in NIA by JICA F/S by the MOT for the Connecting Road (~February 2010)
March 2010	Completion of D/D for NIA T2 First Loan Agreement (L/A) for NIA T2 and Connecting Road Projects
May 2010	Meeting between Minister of MOT and Minister of MLIT, Japan to discuss the needs of technical assistance for operation.
January 2011	L/A for Nhat Tan Bridge Project(II)
April 2011	Technical Training in Japan for the NIA T2 Project Study for formation of the Project for Support on Establishment of the Programs for O&M in NIA Technical Cooperation Project by JICA
November 2011	Built consensus for T2 Commissioning Preparatory Committee供
2012	Users exceeded 11 million in T1, far more than the its planned capacity of 6 million. Dispatch of an Expert for Aviation Policy and Fuel System (Long-Term) by MLIT
2012~13	Dispatch of Experts for New Terminal Management Support (Short-Term) from NAA
February 2012	Ground breaking of the NIA T2
March 2012	NIA T2 Project L/A (II) The start of T2 Commissioning Preparatory Committee ~June 201
March 2013	Nha Tan Bridge Project L/A(III) / Connecting Road Project L/A(II)
October 2013	Project for Support on Establishment of the Programs for O&M in NIA Technical Cooperation Project (Terminal Management) January 2014
December 2013	NIA T2 Project L/A (III) Started to operate the new Lobby E-T1 for domestic LCC airlines constructed by ACV's budget
March 2014	Draft Final Report for Noi Bai International Airport Integrated Development Plan
October 2014	New Kansai International Airport Engineering Co., Ltd started to technical assistance for Fuel Hydrant System (FHS) ~February 2015
December 2014	IATA Inspection for approving the operation of FHS, Start of operation of T2
January 2015	First operation of FHS
4 January	Grand opening ceremony for three projects

Year	Event
2015	Awarded the JICA President's Award for the Three Projects
2016	Awarded the most improved airport in the world by SKYTRAX
May 2017	Signing of an ACV and NAA in recognition of the intermittent and long-term support provided to NIA since 2009,
July 2019	Final disbursement of NIA T2 Project

Reference

Table Bridges over Hong River

NO	Name of Bridge	Opening Year
SS01	Thang Long Bridge	1985
SS02	Chuong Duong Bridge	1985
SS03	Vinh Tuy Bridge	2010
SS04	Thanh Tri Bridge	2007 (Financed by Japan ODA loan
SS05	Long Bien Bridge	1902
SS06	Nhat Tan Bridge	2015

Source: Author



Source : The Ex-Post Evaluation Report Nhat Tan Bridge Project

Figure Bridges over Hong River

