

MINISTRY OF TRANSPORT  
SOCIALIST REPUBLIC OF VIET NAM

**THE PREPARATORY SURVEY  
ON  
LACH HUYEN PORT  
INFRASTRUCTURE CONSTRUCTION  
IN  
VIET NAM  
  
FINAL REPORT**

**JULY 2010**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

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**ORIENTAL CONSULTANTS CO., LTD.**

**PADECO CO., LTD.**

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## **PREFACE**

In response to the request from the Government of The Socialist Republic of Vietnam, Government of Japan decided to conduct the Preparatory Survey for Lach Huyen Port Infrastructure Construction in The Socialist Republic of Vietnam and entrusted to the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Nagao Nobuaki of Oriental Consultants co., LTD and consist of Oriental Consultants co., LTD and PADECO co., LTD between Oct 2009 and July 2010.

The team held discussions with the officials concerned of Ministry of Transport and The Vietnam Maritime Administration and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of The Socialist Republic of Vietnam for their close cooperation extended to the study.

July 2010

Kiyofumi Konishi,

Director General  
Economic Infrastructure Department  
Japan International Cooperation Agency

## LETTER OF TRANSMITTAL

July 2010

Mr. Kiyofumi Konishi  
Director General  
Economic Infrastructure Department  
Japan International Cooperation Agency

Dear Mr. Konishi,

It is my great pleasure to submit herewith the Final Report of a Preparatory Survey on Lach Huyen Port Infrastructure Construction in Viet Nam

The study team composed of ORIENTAL CONSULTANTS CO., LTD and PADECO CO., LTD. conducted surveys in the Socialist Republic of Vietnam over the period between October 2009 and May 2010 according to the contract with the Japan International Cooperation Agency (JICA).

The study team compiled this report, which proposes a medium term port development plan for 2020 and an implementation plan as Japan's ODA loan project, through close consultation with officials of the Government of the Socialist Republic of Vietnam and other authorities concerned.

On behalf of the study team, I would like to express my sincere appreciation to the Government of Vietnam and other authorities for their diligent cooperation and assistance and for the heartfelt hospitality, which they extended to the study team during our stay in Vietnam.

I am also very grateful to the Japan International Cooperation Agency, the Ministry of Foreign Affairs of Japan, the Ministry of Land, Infrastructure, Transport and Tourism of Japan, and the Embassy of Japan in the Socialist Republic of Vietnam for giving us valuable suggestions and assistance during the course of the study.

Yours faithfully,

Nobuaki Nagao  
Team Leader  
The Preparatory Survey  
on Lach Huyen Port Infrastructure  
Construction in Viet Nam

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## LIST OF ABBREVIATIONS

A	AASHTO	American Association of State Highway and Transportation Officials
	ACL	American Container Line, Inc.
	AIDS	Acquired Immune Deficiency Syndrome
	AIS	Automatic Identification System
	ALiCC	Arch action Low improvement ratio Cement Column
	APL	American President Lines
	ADCP	Acoustic Doppler Current Profiler
	ADB	Asian Development Bank
B	ASEAN	Association of South East Asian Nations
	B/C	Cost-Benefit Ratio
	BKK	Bangkok
	BLT	Build - Lease - Transfer
	BOD	Biological Oxygen Demand
	BOO	Build-Operate-Own
	BOR	Berth Occupancy Ratio
	BOT	Build-Operate-Transfer
	BRICs	Brazil, Russia, India and China
	BS	British Standard
	BT	Built – Transfer
C	BTO	Build - Transfer - Operate
	CBR	California Bearing Ratio
	CBTA	Cross Border Transport Agreement
	CD	Chart Datum
	CDL	Chart Datum Level
	CDM	Cement Deep Mixing
	CFS	Container Freight Station
	CHE	Cargo Handling Equipment
	CIF	Cost, Insurance and Freight
	CIQ	Customs, Immigration, Quarantine
	CKYH	Coscon, "K"LINE, Yang Ming, Hanjin Shipping
	CNC	CNC Lines
	COSCO	China Ocean Shipping Company
	COSCON	COSCO Container Lines Co., Ltd
	CSD	Cutter Suction Dredger
	CTP	China-Transpacific Service
	CY	Container Yard
D	DAP	Diammonia Phosphate Fertilizer
	DO	Dissolved Oxygen
	DSCR	Debt Service Coverage Ratio
	DVIZ	Dinh Vu Industrial Zone
	DWT	Deadweight Tonnage
E	ECD	Empty Container Depot
	ECDIS	Electronic Chart Display and Information System
	EHS	Environment, Health and Safety
	EIA	Environmental Impact Assessment
	EIR	Equipment Interchange Receipt
	EIRR	Economic Internal Rate of Return

	EMP	Environmental Management Plan
F	FC	Full Container Ship
	FDI	Foreign Direct Investment
	FEU	Forty-Foot Equivalent Unit
	FIRR	Financial Internal Rate of Return
	FOB	Free On Board
	F/S	Feasibility Study
	FTA	Free Trade Agreement
G	GL	Ground Level
	GOJ	The Government of Japan
	GOV	The Government of Socialist Republic of Viet Nam
	GDP	Gross Domestic Product
	GMS	Greater Mekong Subregion
	GPS	Global Positioning System
	GSO	General Statistics Office of Vietnam
	GT	Gross Tonnage
H	HAPACO	Hai Phong Industrial Zone Joint Stock Company
	HCM	Ho Chi Minh
	HECO	Highway Engineering Consultants
	HHWL	Highest High Water Level
	HIV	Human Immunodeficiency Virus
	HK	Hong Kong
	HP	Haiphong
	HPH	Hutchison Port Holdings
	HWL	High Water Level
	HYMENET	The Center for Hydrometeorological and Environmental Station Network
I	ICB	Interlocking Concrete Block
	IDC	Interest During Construction
	IMF	International Monetary Fund
	IMO	International Maritime Organization
	IP	Industrial Park
	IZ	Industrial Zone
	IRR	Internal Rate of Return
	ISL	Institute of Shipping Economics and Logistics
	IT	Information Technology
J	JBIC	Japan Bank for International Cooperation
	JBSI	Japan Bridge & Structure Institute, Inc.
	JCC	Joint Coordination Committee
	JETRO	Japan External Trade Organization
	JICA	Japan International Cooperation Agency
	JIS	Japanese Industrial Standards
	JIT	Just in Time
	JOPCA	Japan Overseas Ports Cooperation Association
	JPY	Japanese Yen
	JV	Joint Venture
L	LC	Laem Chabang
	LCP	Laem Chabang Port
	LCL	Less than Container Load

	LED	Light Emitting Diode
	LIBOR	London Interbank Offered Rate
	LLWL	Lowest Low Water Level
	Loa	Length Over All
	LWL	Low Water Level
M	MARPOL	International Convention for the Prevention of Pollution from Ships
	METI	Ministry of Economy, Trade and Industry
	MLWL	Mean Low Water Level
	MOM	Minutes of Meeting
	MONRE	Ministry of Natural Resources and Environment
	MOT	Ministry of Transport
	MOU	Memorandum of Understanding
	MP	Multi Purpose Ship
	MPA	Maritime and Port Authority of Singapore
	MPI	Ministry of Planning and Investment
	MPMU	Major Projects Management Unit
	MSC	Mediterranean Shipping Company S.A.
	MSC No.1	Maritime Safety Company No.1
	MSL	Mean Sea Level
	MWL	Mean Water Level
N	N.A.	Not Applicable
	NCPFP	National Committee for Population and Family Planning
	NK	Nippon Koei Co., Ltd
	NPV	Net Present Value
O	ODA	Official Development Assistance
	OOCL	Orient Overseas Container Line
P	PAB	Project Affected Fishing Boats
	PAH	Project Affected Household
	PAP	Project Affected People
	PAT	The Port Authority of Thailand
	PC	Prestressed Concrete
	PC	The People's Committee
	PCU	Passenger Car Unit
	PDA	Pile Driving Analyzer
	PHC	Prestressed High-strength Concrete
	PIANC	Permanent International Association of Navigation Congress
	PIL	Pacific International Lines (Pte) Ltd .
	PM	Prime Minister
	PMB	Port Management Body
	PMU	Project Management Unit
	POC	Port Operating Company
	PPP	Public Private Partnership
	PRC	People's Republic of China
	PSA	Port of Singapore Authority
	PTI	Pre Trip Inspection
	PVD	Prefabricated Vertical Drain
Q	QGC	Quay Gantry Crane
R	RAP	Resettlement Assistance Program

	RC	Reinforced Concrete
	RCL	Regional Container Lines
	RO	Rehabilitate – Own
	ROE	Return on Equity
	RORO	Roll-On/Roll-Off ship
	ROT	Rehabilitate - Operate - Transfer
	RTG	Rubber Tyred Gantry (Crane)
S	SAPROF	Special Assistance for Project Formation
	SC	Slot Charter
	SCF	Standard Conversion Factor
	SDVDC	South Dinh Vu Development Joint Stock Company
	SITC	SITC Container Lines Co., Ltd
	SP	Singapore
	SPC	Special-Purpose Company
	SPP	Steel Pipe Pile
	SPT	Standard Penetration Test
	SSPP	Steel Sheet Pipe Pile
	STEP	Special Terms for Economic Partnership
T	TCVN	Vietnam Standards (Tiêu Chuẩn Việt Nam)
	TCXDVN	Vietnamese Construction Standard (Tiêu chuẩn Xây dựng Việt Nam)
	TDSI	Transport Development and Strategy Institute
	TEDI	Transport Engineering Design Incorporated
	TEDIPOET	Port & Waterway Engineering Consultant Joint Stock Company
	TEU	Twenty-foot Equivalent Unit
	TNWA	The New World Alliance
	TSHD	Trailing Suction Hopper Dredger
	TSS	Total Suspended Solids
U	UKC	Under Keel Clearance
	UNCTAD	United Nations Conference on Trade and Development
	UNESCO	United Nations Educational, Scientific and Cultural Organization
	USA	United States of America
	UXO	Unexploded Ordnance
V	VAT	Value-Added Tax
	VHF	Very High Frequency
	VIDIFI	Vietnam Infrastructure Development and Financial Investment
	VINALINES	Vietnam National Shipping Lines
	VINAMARINE	Vietnam National Maritime Bureau
	VINASHIN	Vietnam Shipbuilding Industry Corporation
	VITRANSS	National Transport Development Strategy in the Socialist Republic of Vietnam
	VMS	Vietnam Maritime Safety Agency
	VND	Vietnamese Dong
	VNHC	Vietnam National Hydrographic Center
	VPA	Vietnam Seaports Association
	VTs	Vessel Traffic Service
W	WACC	Weighted Average Cost of Capital
	WB	The World Bank
	WTO	World Trade Organization

## PART – 1

### Necessity and Background of the Project

## **1. Introduction**

### **1.1 Background of the Preparatory Survey**

In the northern region of Viet Nam, maritime cargo traffic volume is likely to increase to 56 million tons in the year 2010, and to 110 – 130 million tons in the year 2020. These figures will exceed the cargo handling capacity of both Hai Phong and Cai Lan ports (total capacity of 75 million tons) located in the northern region. There is an urgent need to boost the cargo handling capacity of ports located in the northern region of Viet Nam.

Facing this situation, the Government of Socialist Republic of Viet Nam (hereinafter referred to as “GOV”) directed Transport Engineering Design Incorporated (hereinafter referred to as “TEDI”) to make a feasibility study on Lach Huyen Port Infrastructure Construction Project (hereinafter referred to as “the Project”) located in the northern region of Viet Nam. Based on the result of the feasibility study, GOV has requested the Government of Japan (hereinafter referred to as “GOJ”) to provide yen loan to the Project in order to enforce the development plan proposed in its feasibility study stage. In accordance with this request, the Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched a mission on the Project (hereinafter referred to as “the JICA Mission”) to Viet Nam from July 20 to 23, 2009 in order to develop scope and implementing arrangements of a further survey which will review the currently available data and conduct supplementary study to facilitate formation of the Project (hereinafter referred to as “the Preparatory Survey”). Based on this preliminary survey, the scope and implementing arrangements of the Preparatory Survey were settled and signed by JICA, Ministry of Transports and Vietnam National Shipping Lines (hereinafter referred to as “VINALINES”).

The Project is comprised of developments of port and its access road and bridge. Although it is considered essential that both components are implemented in an integrated manner, the Preparatory Surveys for them are conducted by different survey teams. Since this report mainly describes the port portion, for detailed information of the access road and bridge, refer to the report prepared by another Preparatory Survey team.

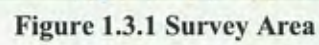
### **1.2 Objectives of the Preparatory Survey**

The principal objectives of the Preparatory Survey are to examine the existing feasibility study on port development plans including the Hai Phong – Lach Huyen International Gateway Port development plan from a technical and a financial as well as a natural and social environmental standpoint, and refine the implementation plan of the future development plan of Lach Huyen Port Infrastructure Construction Project.

### **1.3 Survey Area**

The Preparatory Survey shall cover the area of Hai Phong – Lach Huyen International Gateway Port as shown in Figure 1.3.1.







## 1.4 Survey Schedule

The Preparatory Survey commenced immediately following the agreement on the inception report. Detailed Survey schedule is shown in Figure 1.4.1.

TIME		TASK	REPORTS
October 2009		<b>Preparatory Work in Japan</b> ★Collection & analysis of existing data / information	
October 2009		★Preparation of Inception Report & Questionnaires	
October 2009	P H A S E   1	<b>1st Work in Viet Nam</b> ★Presentation / Discussion of Inception Report ★Existing Data Collection and Analysis ★Socio-economic Situation of Vietnam and Surrounding Region ★Situation of Distribution of Goods and Ocean Shipping in Vietnam and Surrounding Region ★Present Situation of Ports in Northern Vietnam and Surrounding Region ★Past Port Development Plans in Northern Vietnam and Lach Huyen Port ★Demand Forecast (Target Year 2020) ★Collection of Existing Natural Condition Data and Execution of Additional Investigation ★Assessment of the Existing Simulation Data on Sedimentation and Execution of Further Study ★Review of Natural and Social Environmental Assessment Study and Conduct Further Study	Inception Report
November 2009			
November 2009			
January 2010	P H A S E   2	★The Scale of Medium Term Port Development Plan ★Port Layout Plan ★Access from Land to the Port ★Conceptual Design and Cost Estimates ★Consideration on Natural and Social Environment	
January 2010			
January 2010		<b>1st Work in Japan</b> ★Preparation of Interim Report	
February 2010	P H A S E   3	<b>2nd Work in Viet Nam</b> ★Presentation / Discussion of Interim Report ★Recommendation of Suitable Project Scope ★Establishment of Basic Design Conditions ★Basic Design of Port Structures, Cargo handling Equipment and Related Facilities ★Construction Plan ★Project Cost Estimates ★Project Implementation Schedule ★Organizational Structure for Project Implementation ★Financial Condition of Executing Agency and Financial Implementation Plan ★Recommendation of Appropriate Contract Packages ★Financial Analysis of Container Terminal ★Economic Analysis of Whole Project ★Operation and Effective Indicators ★Recommendation for Suitable and Effective Collaboration between Public and Private ★Operation and Management Organization ★Mitigation Measures for Natural and Social Environmental Aspects ★Navigational Safety and Vessel Traffic Control	Interim Report
March 2010			
April 2010			
April 2010		<b>2nd Work in Japan</b> ★Preparation of Draft Final Report	
April 2010			
May 2010		<b>3rd Work in Viet Nam</b> ★Presentation / Discussion of Draft Final Report	Draft Final Report
May 2010			
June 2010		<b>Final Work in Japan</b> ★Finalization and Submission of Final Report	Final Report
June 2010			

Figure 1.4.1 Survey Schedule

## 2. Socio – Economic Background Information

### 2.1 General

#### 2.1.1 Population

According to the preliminary results of census April 1, 2009, the population of Vietnam is estimated as 85,789,573. Vietnam is divided into 58 provinces and there are also 5 centrally-controlled municipalities existing at the same level as provinces. Ho Chi Minh City is the biggest municipality with population of 7,123,000 and followed by Hanoi (6,449,000) as shown in Table 2.1.1.

**Table 2.1.1 Average Population by Region and Province**

Region	Provinces	Population (1 April 2009)	Region	Provinces	Population (1 April 2009)
<b>Whole Vietnam</b>		<b>85,789,573</b>			
Red River Delta 18,433,563	Bắc Ninh	1,024,151	Central Highlands 5,107,437	Daklak	1,728,380
	Hà Nam	785,057		Dak Nong	489,442
	Hải Dương	1,703,492		Gia Lai	1,272,792
	Hưng Yên	1,128,702		Kontum	430,037
	Nam Định	1,825,771	South Central Coast 7,028,570	Lâm Đồng	1,186,786
	Ninh Bình	898,459		Bình Định	1,485,943
	Thái Bình	1,780,954		Khánh Hòa	1,156,903
	Vĩnh Phúc	1,000,838		Phú Yên	861,993
	Hà Nội *	6,448,837		Quảng Nam	1,419,503
	Hải Phòng *	1,837,302		Quảng Ngãi	1,217,159
North Central Coast 10,073,336	Hà Tĩnh	1,227,554	Southeast 15,758,966	Đà Nẵng *	887,069
	Nghệ An	2,913,055		Bà Rịa-Vũng Tàu	994,837
	Quảng Bình	846,924		Bình Dương	1,482,636
	Quảng Trị	597,985		Bình Phước	874,961
	Thanh Hoá	3,400,239		Bình Thuận	1,169,450
	Thừa Thiên-Huế	1,087,579		Đồng Nai	2,483,211
Northeast 9,480,044	Bắc Giang	1,555,720		Ninh Thuận	564,129
	Bắc Kạn	294,660		Tây Ninh	1,066,402
	Cao Bằng	510,884		Hồ Chí Minh City *	7,123,340
	Hà Giang	724,353	Mekong River Delta 17,178,871	An Giang	2,144,772
	Lạng Sơn	731,887		Bạc Liêu	856,250
	Lào Cai	613,075		Bến Tre	1,254,589
	Phú Thọ	1,313,926		Cà Mau	1,205,108
	Quảng Ninh	1,144,381		Đồng Tháp	1,665,420
	Thái Nguyên	1,124,786		Hậu Giang	756,625
	Tuyên Quang	725,467		Kiên Giang	1,683,149
	Yên Bái	740,905		Long An	1,436,914
Northwest 2,728,786	Điện Biên	491,046		Sóc Trăng	1,289,441
	Hoà Bình	786,964		Tiền Giang	1,670,216
	Lai Châu	370,135		Trà Vinh	1,000,933
	Sơn La	1,080,641		Vĩnh Long	1,028,365
				Cần Thơ *	1,187,089

Source: The 2009 Vietnam population and housing census, Preliminary result, GSO

Note: \*: municipality

The Vietnam categorizes the various provinces into eight regions. The Red River Delta comprising of 10 provinces is the most populated region (18,433,563), followed by Mekong River Delta (17,178,871). The Red River Delta and the Mekong River Delta are the regions containing the deltas of the two large rivers, where fertile land and favorable conditions for agricultural cultivation are located. These two regions share 41.5% of the country's population.



On the other hand, the population density in the Red River Delta is also the highest (1,232 people/km<sup>2</sup>) and followed by the Southeast (453 people/km<sup>2</sup>) and then the Mekong River Delta (423 people/km<sup>2</sup>). The national average population density is 259 people/km<sup>2</sup>, and the least populated region is the Northwest (72.9/km<sup>2</sup>). Figure 2.1.1 illustrates the regions of Vietnam and their population densities.

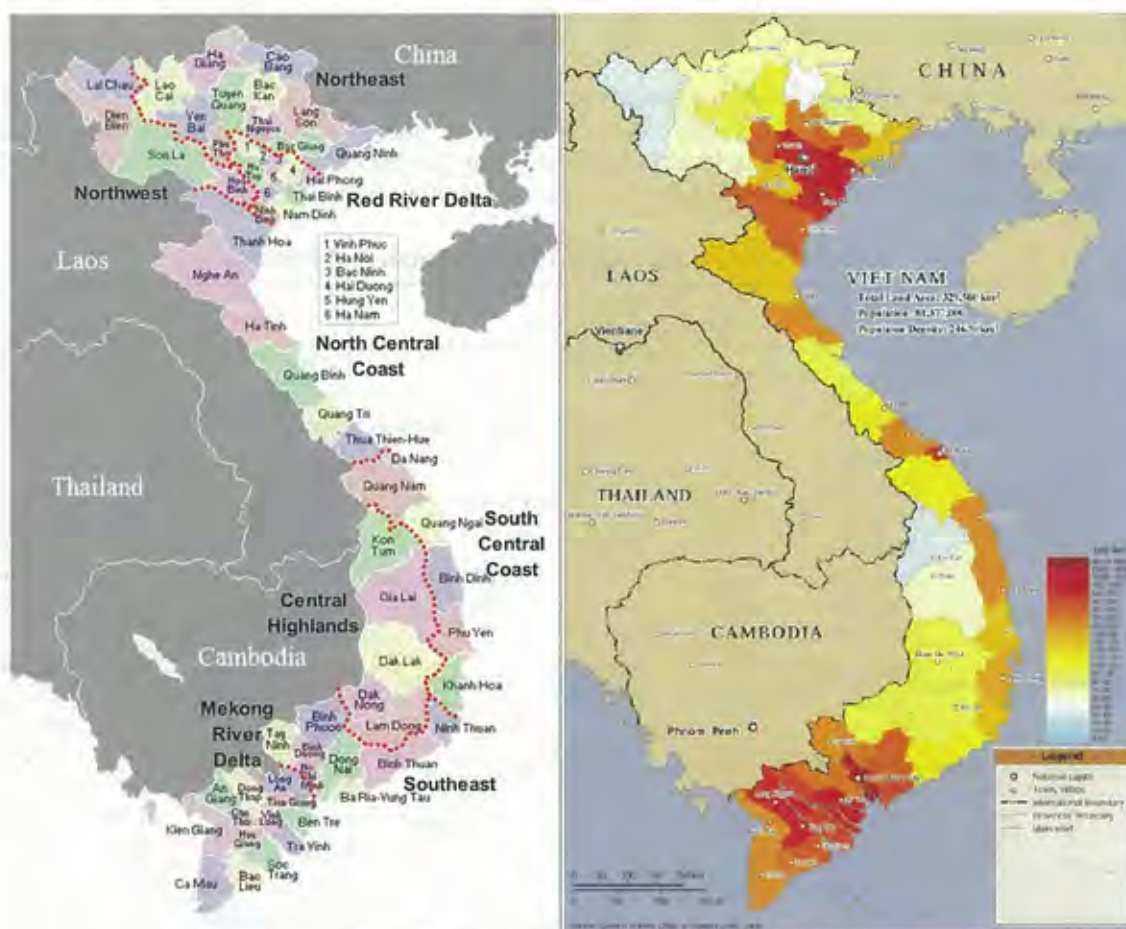


Figure 2.1.1 Regions and Population Density

Source: GSO and Wikipedia, modified by JICA Study Team

According to the National Committee for Population and Family Planning (NCPFP), it is estimated that the annual population growth rate for the period from 2010 through 2020 is 1.3%. With this growth rate, the populations are estimated as 92.9 million in 2015, 99.3 million in 2020. Moreover, average population by region is forecast for 8 regions up to the year 2020 as shown in the Table 2.1.2.

## 2.1.2 Economic Indices

Actual GDPs of Viet Nam, Asian countries and USA since 2000 and their forecasts by IMF are shown in Figure 2.1.2. From 2004 to 2007, annual GDP growth rate in Viet Nam rose to over 8%, and then slowed down to 6.2% in 2008. Figure 2.1.2 clearly indicates the impact of global financial crisis on each country's GDP in the years of 2008 and 2009. After 2009, the GDPs growth rates are estimated to recover from the year 2010. Table 2.1.3 indicates the GDP's forecast by IMF, ADB, the World Bank (WB) and the Ministry of Planning and Investment (MPI).

In the international donor agency's forecast, only Viet Nam, China, India and Indonesia is estimated more than 4% of GDP growth rate in 2009. Ministry of Planning and Investment (MPI) in Viet Nam is assumed for GDP growth rate in 2010-2020 as 6.5% for sustainable growth of GDP and 7.5% for high level of GDP.

Table 2.1.2 Average Population by Region

Region	Actual Data		Forecast	
	2009	2010	2015	2020
Red River Delta	18,433.6	18,691.6	20,037.2	21,479.6
Growth Rate		1.4%	1.4%	1.4%
Northeast	9,480.0	9,555.9	9,944.3	10,348.5
Growth Rate		0.8%	0.8%	0.8%
Northwest	2,728.8	2,769.7	2,983.8	3,214.4
Growth Rate		1.5%	1.5%	1.5%
North Central Coast	10,073.3	10,174.1	10,693.0	11,238.5
Growth Rate		1.0%	1.0%	1.0%
South Central Coast	7,028.6	7,112.9	7,550.1	8,014.1
Growth Rate		1.2%	1.2%	1.2%
Central Highlands	5,107.4	5,184.0	5,584.7	6,016.3
Growth Rate		1.5%	1.5%	1.5%
Southeast	15,759.0	16,105.7	17,957.0	20,021.1
Growth Rate		2.2%	2.2%	2.2%
Mekong River Delta	17,178.9	17,333.5	18,127.7	18,958.2
Growth Rate		0.9%	0.9%	0.9%
WHOLE COUNTRY	85,789.6	86,927.4	92,877.7	99,290.6
Growth Rate		1.3%	1.3%	1.3%

Source: Future growth rates were estimated by NCPFP and 2009 data is actual data on census April 1, 2009

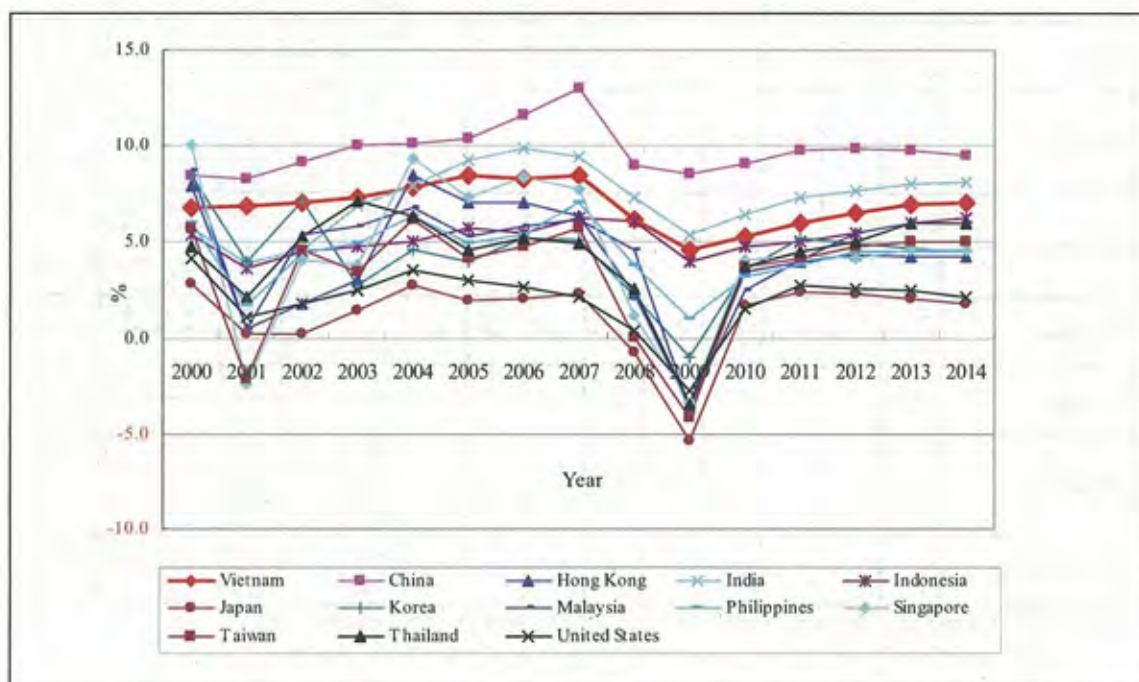


Figure 2.1.2 Actual GDP Growth Rates and IMF's Forecast in Vietnam, Asian Countries/USA



Table 2.1.3 GDP Growth Rate of Viet Nam, Asian Countries/USA by Year

Country	Year									Forecast						
	2000	2001	2002	2003	2004	2005	2006	2007	2008	by	2009	2010	2011	2012	2013	2014
Vietnam	6.8	6.9	7.1	7.3	7.8	8.4	8.2	8.5	6.2	IMF	4.6	5.3	6.0	6.5	7.0	7.0
										ADB	4.7	6.5				
										WB	5.5	5.0	7.0			
										MPI	5-5.5%	6.5% for 2010-2020				
China	8.4	8.3	9.1	10.0	10.1	10.4	11.6	13.0	9.0	IMF	8.5	9.0	9.7	9.8	9.8	9.5
										ADB	8.2	8.9				
										WB	6.5	8.3	7.2			
Hong Kong	8.0	0.5	1.8	3.0	8.5	7.1	7.0	6.4	2.4	IMF	-3.6	3.5	4.0	4.3	4.3	4.3
										ADB	-4.0	3.0				
India	5.7	3.9	4.6	6.9	7.9	9.2	9.8	9.4	7.3	IMF	5.4	6.4	7.3	7.6	8.0	8.1
										ADB	6.0	7.0				
										WB	5.9	8.1	8.5			
Indonesia	5.4	3.6	4.5	4.8	5.0	5.7	5.5	6.3	6.1	IMF	4.0	4.8	5.0	5.5	6.0	6.3
										ADB	4.3	5.4				
										WB	3.5	5.0	6.0			
Japan	2.9	0.2	0.3	1.4	2.7	1.9	2.0	2.3	-0.7	IMF	-5.4	1.7	2.4	2.3	2.0	1.8
										WB	-6.8	1.0	2.0			
Korea	8.5	4.0	7.2	2.8	4.6	4.0	5.2	5.1	2.2	IMF	-1.0	3.6	5.2	5.0	4.7	4.5
										ADB	-2.0	4.0				
Malaysia	8.7	0.5	5.4	5.8	6.8	5.3	5.8	6.2	4.6	IMF	-3.6	2.5	4.1	5.5	6.0	6.0
										ADB	-3.1	4.2				
										WB	-4.4	2.2	5.3			
Philippines	6.0	1.8	4.4	4.9	6.4	5.0	5.3	7.1	3.8	IMF	1.0	3.2	3.8	4.5	4.5	4.5
										ADB	1.6	3.3				
										WB	-0.5	2.4	4.5			
Singapore	10.1	-2.4	4.1	3.8	9.3	7.3	8.4	7.8	1.1	IMF	-3.3	4.1	4.3	4.2	4.6	4.6
										ADB	-5.0	3.5				
Taiwan	5.8	-2.2	4.6	3.5	6.2	4.2	4.8	5.7	0.1	IMF	-4.1	3.7	4.2	4.8	5.0	5.0
										ADB	-4.9	2.4				
Thailand	4.8	2.2	5.3	7.1	6.3	4.6	5.2	4.9	2.6	IMF	-3.5	3.7	4.5	5.0	6.0	6.0
										ADB	-3.2	3.0				
										WB	-3.2	2.2	3.1			
United States	4.1	1.1	1.8	2.5	3.6	3.1	2.7	2.1	0.4	IMF	-2.7	1.5	2.8	2.6	2.5	2.1
										WB	-3.0	1.8	2.5			

Source: IMF (International Monetary Fund), World Economic Outlook Database, October 2009

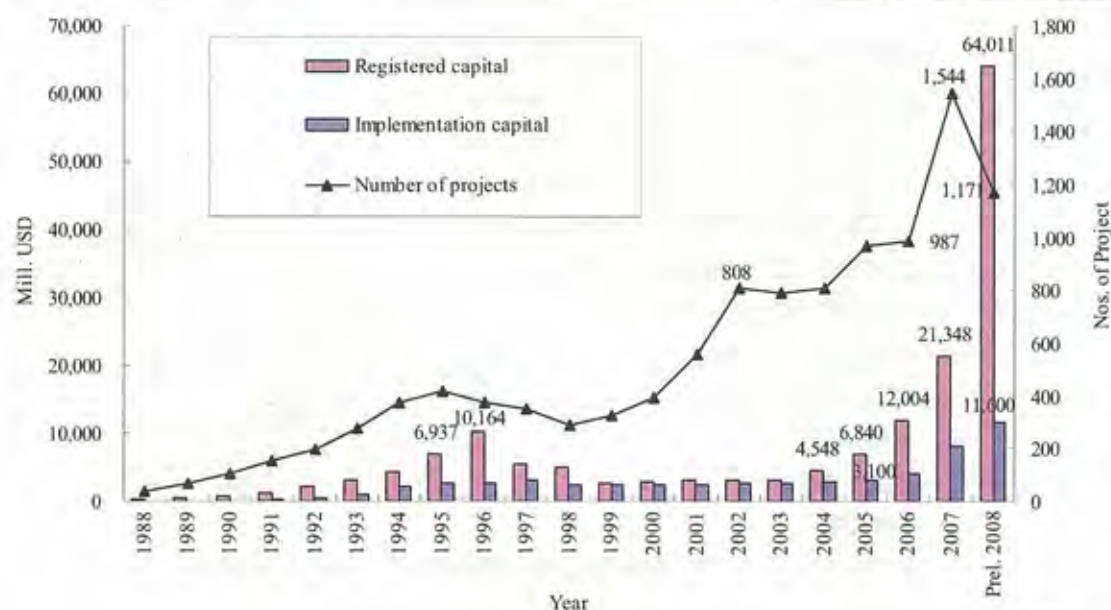
ADB (Asia Development Bank ), Asian Development Outlook 2009 Update, Sep 2009

WB (World Bank ), Global Development Finance, May 2009. But 2009's GDP 5.5% in Vietnam, WB updated 4 Nov ;

MPI (Ministry of Planning and Investment) , 2009 GDP forecast was announced by 7th plenary session of National Assembly's Economic Committee, May 2009

### 2.1.3 Foreign Direct Investment (FDI)

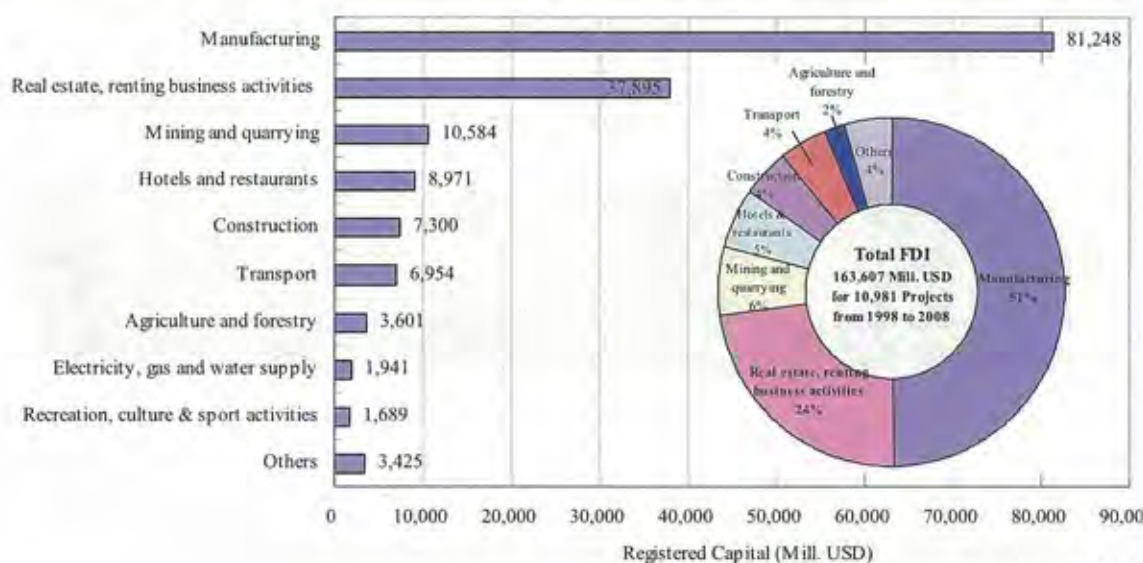
After 20 years of economic reform, Vietnamese economic growth is driven by the strong FDI inflows. Especially, the past three years, since 2006, FDI inflows sharply increased, thanks to the favorable FDI promotion policies after the accession WTO. In 2006, registered FDI recorded 12 billion USD; then, in 2007 reached 21.3 billion USD; in 2008 increased 64 billion USD, tripled from 2007 (Figure 2.1.3).



Source: GSO

Figure 2.1.3 FDI Inflows

From 1988 to 2008, FDI inflows have been focused especially on manufacturing sector with 81.3 billion USD (51% of total) and followed by real estate, renting business activities sector with 37.9 billion USD (24% of total), both sectors have high proportion in the FDI inflow (Figure 2.1.4).

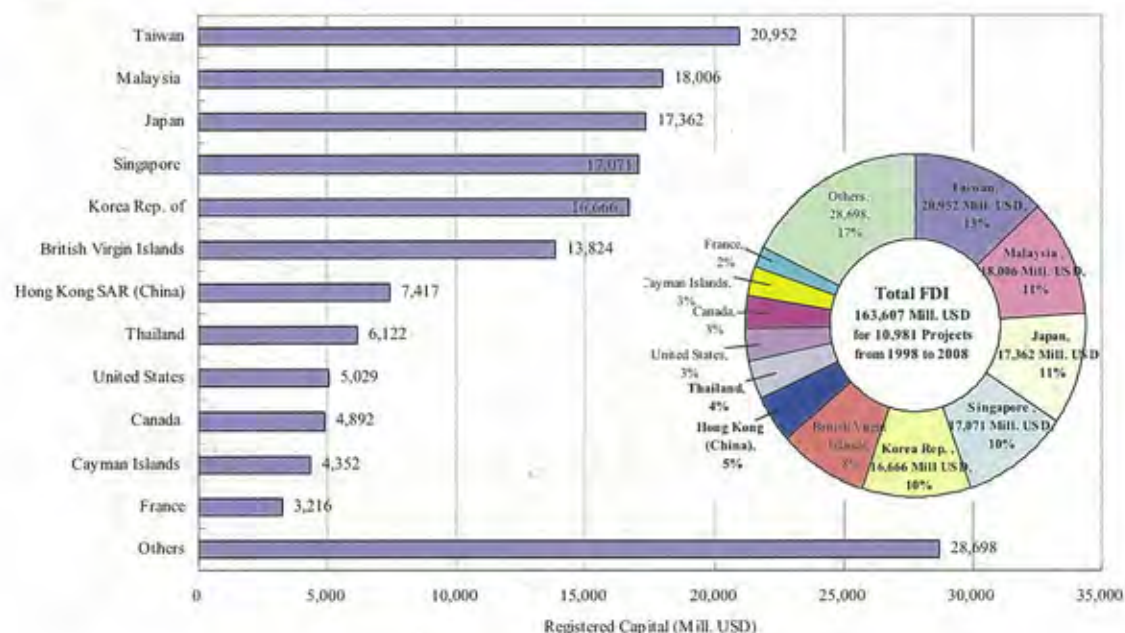


Source: GSO

Figure 2.1.4 FDI Inflows from 1988 to 2008 by Sector

From 1988 to 2008, top 10 countries and territories having invested into Vietnam are Taiwan, Malaysia, Japan, Singapore, Korea, British Virgin Islands, Hong Kong, Thailand, United States and Canada, accounting for 78% of registered capital of total FDI inflows. Out of the top 10 countries and territories, seven are Asian countries accounting for 64 % in total FDI inflows as shown in Figure 2.1.5.

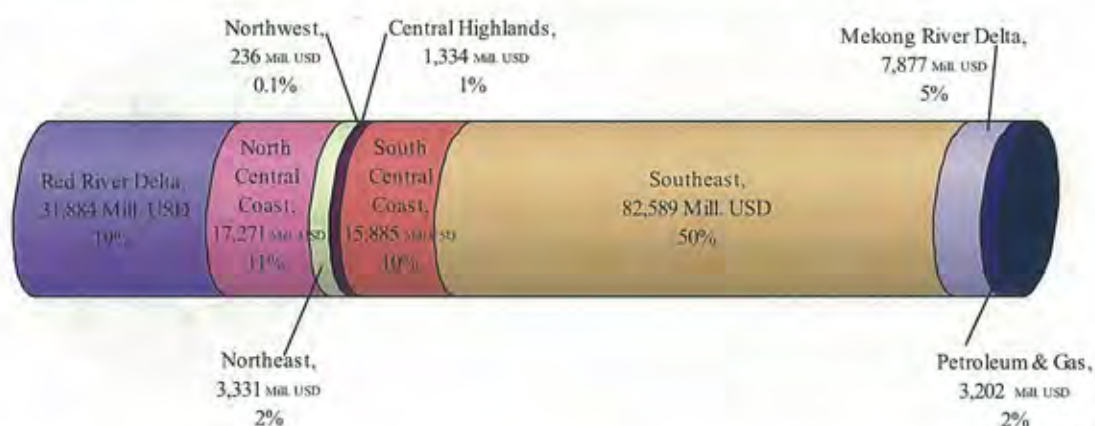




Source: GSO

Figure 2.1.5 FDI Inflows from 1988 to 2008 by Countries

From 1988 to 2008, registered capital of FDI Inflows in the Southeast region hit the highest 82.6 billion USD accounting for half of total and followed by Red River Delta 31.9 billion USD (19% of total). Figure 2.1.6 shows registered capital in FDI inflows (1998-2008) by regions.



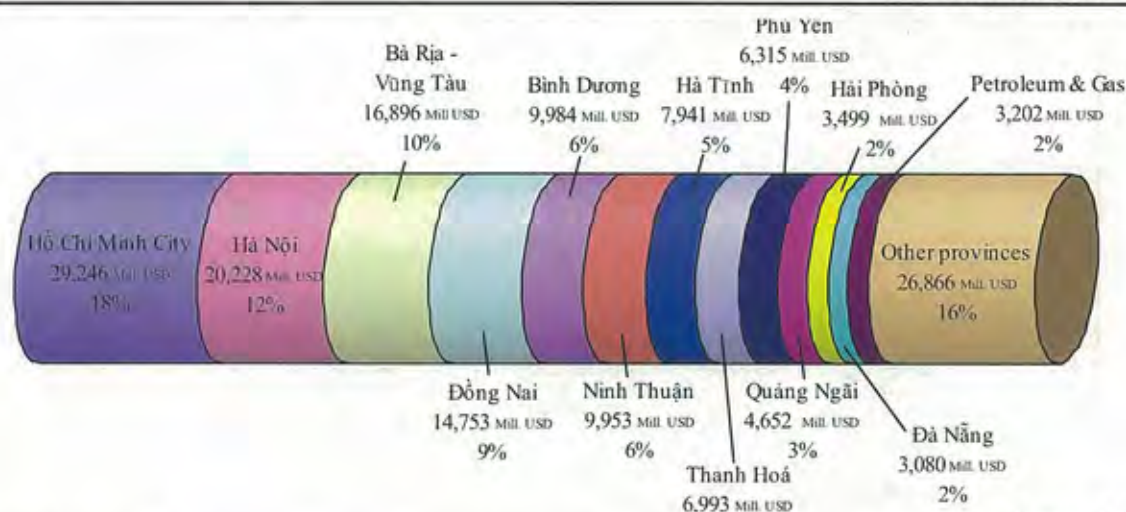
Source: GSO

Note: Including supplementary capital to licensed projects in previous years, including Petroleum & Gas

Figure 2.1.6 Registered Capital of FDI Inflows from 1988 to 2008 by Regions

On the other hands, top 12 provinces and municipalities of registered capital of FDI flows are Ho Chi Minh City, Hanoi, Ba Ria-Vung Tau, Dong Nai, Binh Duong, Ninh Thuan, Ha Tinh, Thang Hoa, Phu Yen, Quang Ngai, Hai Phong, Danang, accounting for 82% of total registered capital of FDI flows (Figure 2.1.7).



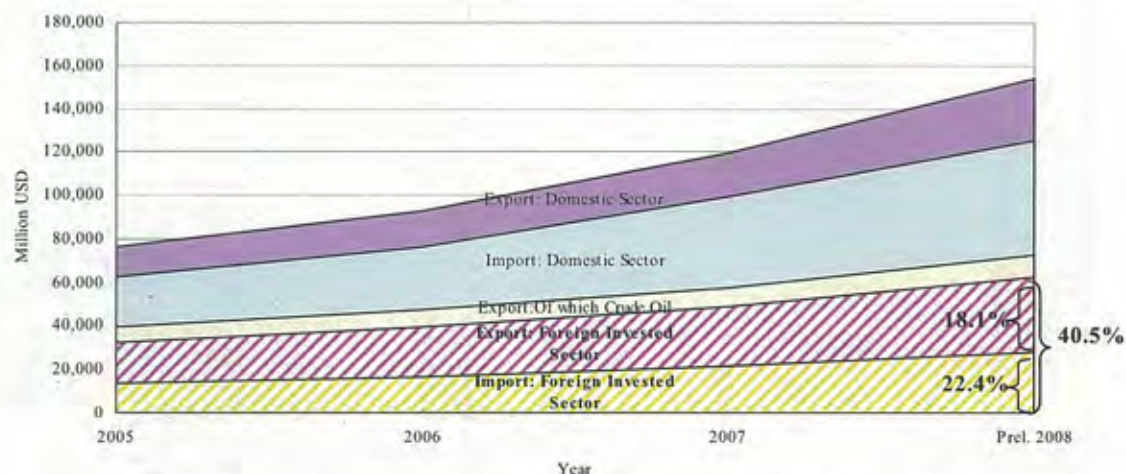


Source: GSO

Note: Including supplementary capital to licensed projects in previous years, including Petroleum & Gas

**Figure 2.1.7 Registered Capital of FDI Inflows from 1988 to 2008 by Provinces and Municipalities**

Based on the information of Ministry of Planning and Investment, the share of foreign investment sector in the total trade value was 40.5% in 2008, consisting of 18.1% for Export and 22.4% for Import (Figure 2.1.8).



Source: For Implementation of the Five-year Socio-economic Development Plan 2006-2010, MPI

**Figure 2.1.8 Foreign Invested Sector in Merchandise Trade (2005-2008)**

According to the information of Ministry of Planning and Investment, by the end of June 2009, Vietnam had 230 industrial parks and export processing zones with 144 operating and 86 still under construction. Figure 2.1.9 shows the list of established Industrial Parks and Figure 2.1.10 shows "Master plan of Industrial Park Development to 2015 and Vision 2020".





Figure 2.1.9 List of Established Industrial Parks





Source: MPI

Figure 2.1.10 Master Plan of Industrial Park Development to 2015 and Vision 2020

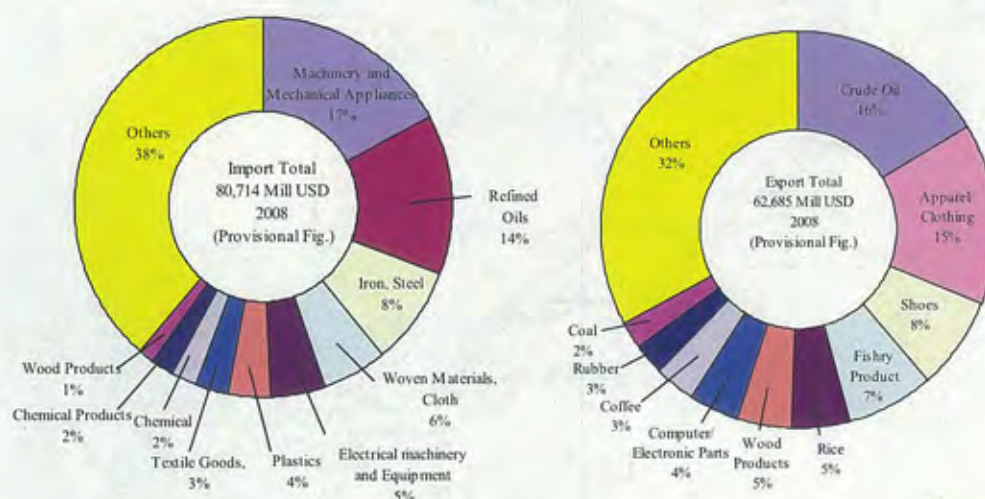


## 2.2 Distribution of Goods and Ocean Shipping

### 2.2.1 Distribution of Goods

#### 1) Trade in Viet Nam

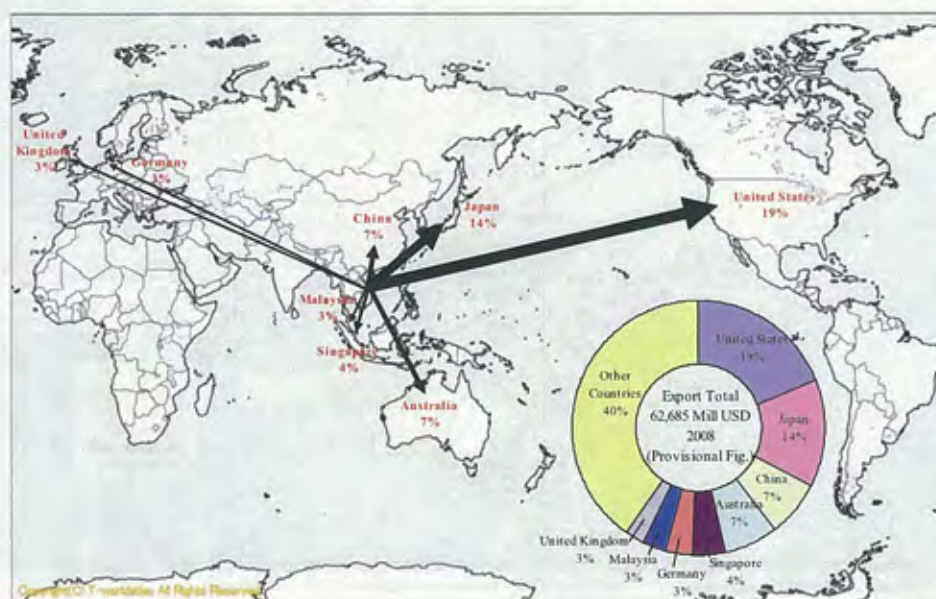
Vietnam has demonstrated its strong commitment to trade liberalization in recent years. It has joined the WTO in 2007 and signed Free Trade Agreements (FTAs) with ASEAN countries and the USA. Vietnam also has a cooperation agreement with the EU. In 2008, exports are mainly made up of crude oil, apparel/clothing and shoes, whereas imports are mainly made up of machinery, refined oil and steel (Figure 2.2.1).



Source: JETRO

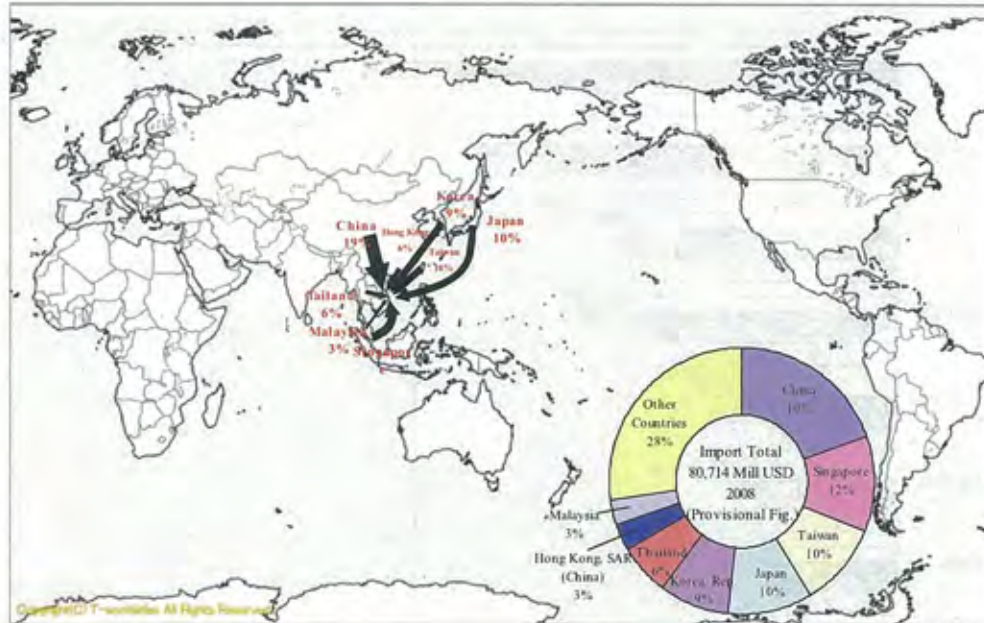
Figure 2.2.1 Main Commodity of Import and Export

The main export customers of Vietnam are the USA, Japan, Australia and China. For imports, the country's main partners are China, Singapore, Taiwan, Japan, South Korea and Thailand. (See Figure 2.2.2 and Figure 2.2.3 Trade Partner Country of Import and Export in 2008)



Source: JETRO

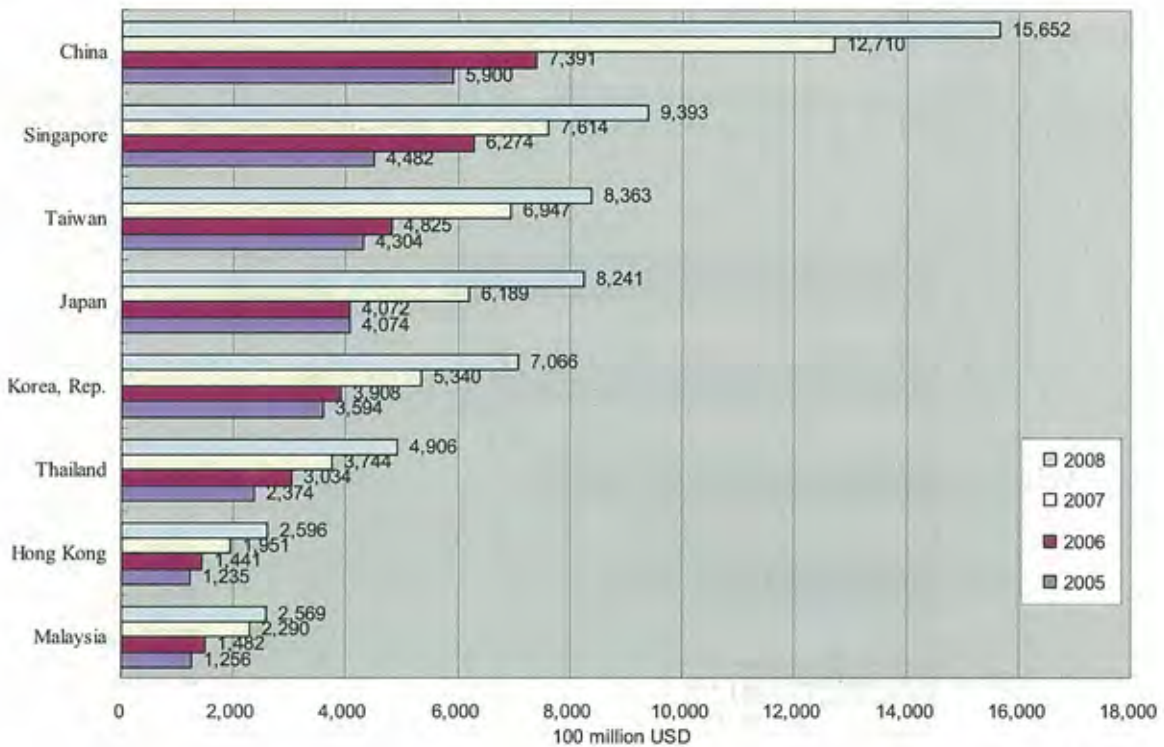
Figure 2.2.2 Trade Partner Country of Export in 2008



Source: JETRO

Figure 2.2.3 Trade Partner Country of Import in 2008

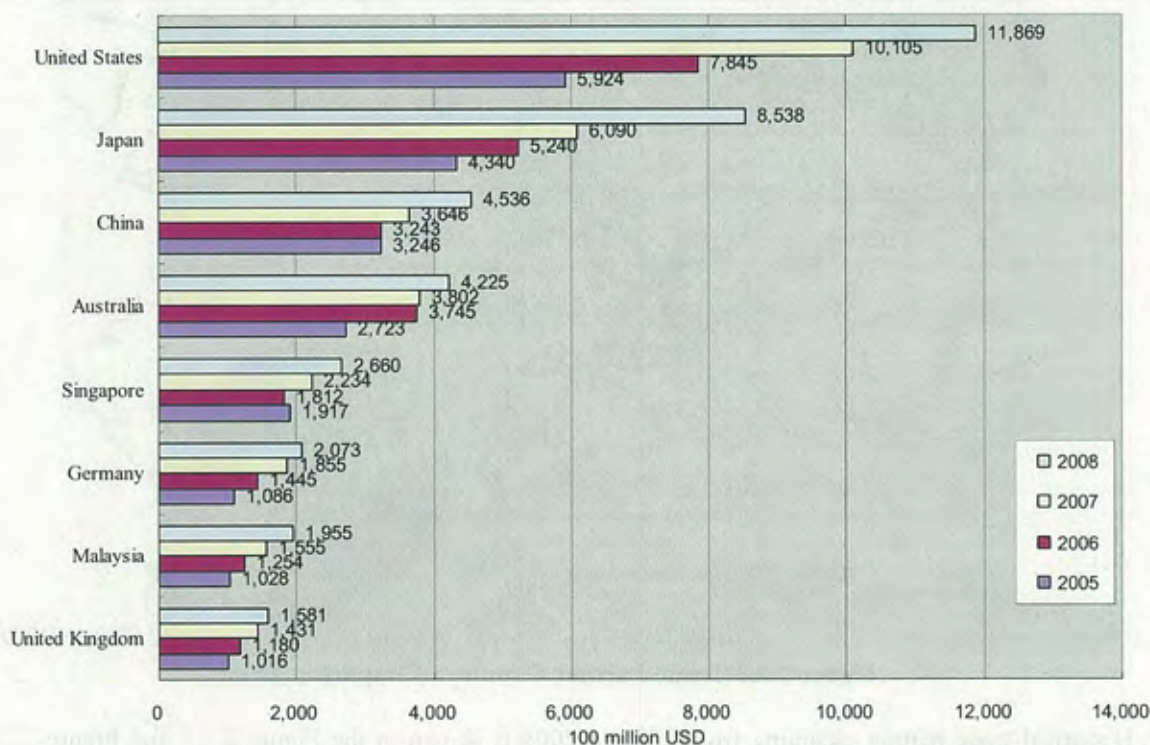
Historical trade partner changing from 2005 to 2008 is shown in the Figure 2.2.4 and Figure 2.2.5. China is top trade partner, and then Japan is second, followed by USA and Singapore.



Source: GSO and JETRO

Figure 2.2.4 Leading Import Market 2005-2008



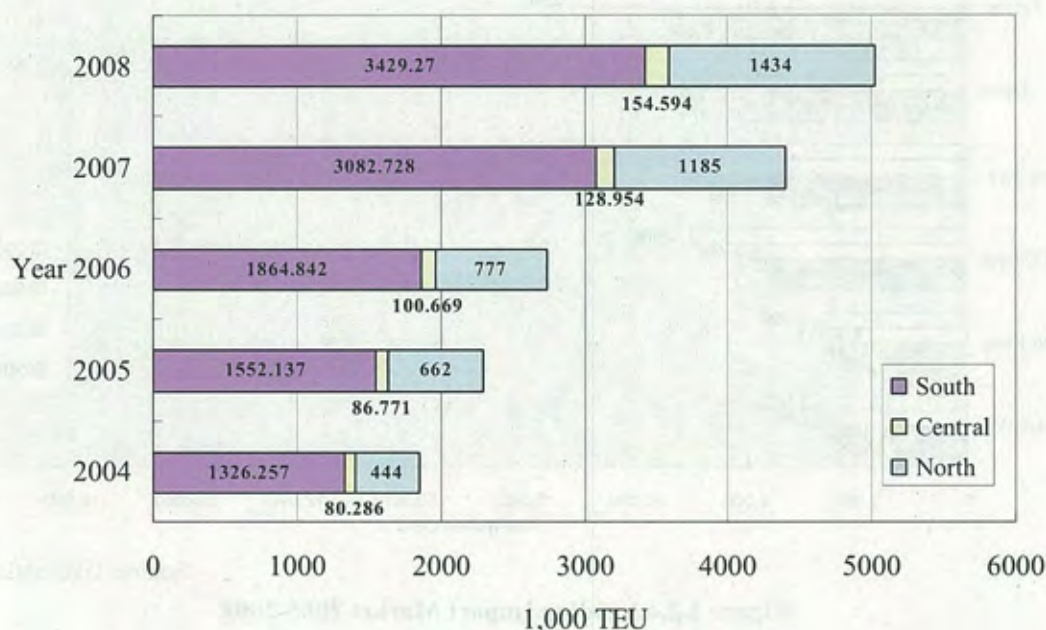


Source: GSO and JETRO

Figure 2.2.5 Leading Export Market 2005-2008

## 2) Rapid Growth of Container Movement in Viet Nam's Sea Ports

In 2008, Viet Nam's seaport handled 5,018,000 TEU, 2.7 times of 1,851,000 TEU in 2004. Especially, Northern Viet Nam's sea ports handled 1,434,000 TEU, 3.2 times of 444,000 TEU in 2004 (Figure 2.2.6).



Source: Vietnam Seaport Association and VINAMARINE

Figure 2.2.6 Rapid Growth of Container Movement in Viet Nam's Sea Ports

### 3) Nationwide Cargo Throughputs in the Seaports

In 2008, Viet Nam's seaport handled 143,612,000 tons, comprising 46,592,000 tons of import, 54,182,000 tons of export and 42,838,000 tons of domestic transport. On the other hand, total vessel calls were 30,367 in the Vietnam's Seaports, consisting of 9,867 calls in North Vietnam, 8,423 calls in Central Vietnam and 12,077 in South Vietnam (Table 2.2.1).

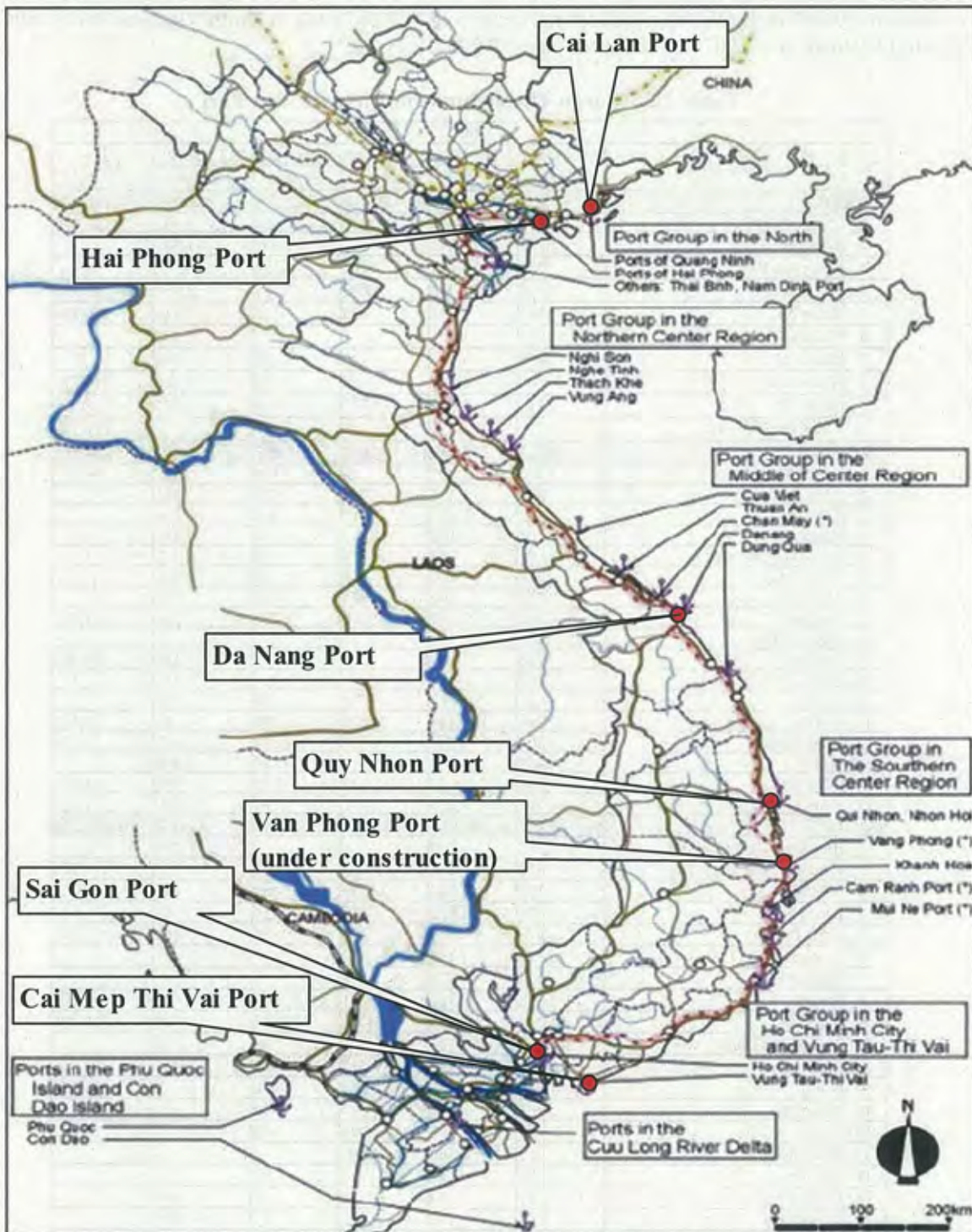
**Table 2.2.1 Cargo Throughputs in Vietnam' Sea Port**

2008							
No.	Ports'name	Vessels Calls	Cargo throughput (x 1,000 MT)				TEUs
			Tons	Import	Export	Domestic	
NORTH		9,867	59,655	13,814	22,748	23,093	1,446,944
1	Quang Ninh	378	3,023	856	1,664	503	35,028
2	Cam Pha	2,186	25,232	-	13,431	11,801	
3	Cang dau B12	325	6,753	3,382	3,371		
4	Hai Phong	4,779	13,900	7,635	3,231	3,034	729,978
5	Doan Xa	245	3,303	533	338	2,432	156,314
6	Vat Cach	997	1,501			1,501	
7	Cua cam	439	566	126	80	360	
8	Transvina	200	2,600	55	79	2,466	115,771
9	Dinh Vu	318	2,777	1,227	554	996	218,269
10	Other Private Ports						191,584
CENTRAL		8,423	15,035	1,649	5,993	7,393	154,594
1	Thanh Hoa	1,344	1,527	20	100	1,407	
2	Nghe Tinh	893	1,331	43	522	766	
3	Ha Tinh	352	1,187	10	813	364	
4	Quang Binh	202	132		14	118	
5	Vinashin-Cua Viet	95	30	13	10	7	
6	Thuan An	82	177	1	25	151	
7	Chan Mav	251	800	18	400	382	
8	Da Nang	1,542	2,742	526	1,230	986	61,881
9	9 Song Han						
10	Hai Son	125	120	10		110	10,000
11	Nguyen Van Troi	202	136			136	
12	Ky Ha	135	210	10	60	140	
13	Ky Ha – Quang Nam	286	400	126	176	98	6,115
14	Quy Nhon	1,296	3,311	835	1,524	952	72,276
15	Thi Nai	467	464	10	54	400	
16	Nha Trang	648	1,172	15	211	946	4,322
17	Cam Ranh	503	1,296	12	854	430	
SOUTH		12,077	68,922	31,129	25,441	12,352	3,429,270
1	Ben Dam – Con Dao VT	221*	250			250	
2	Thuong Cang Vung Tau	467	855	32	704	119	251
3	Phu My	382	2,743	2,179	88	476	
4	Dong Nai	775	2,803	721	914	1,168	
5	Binh Duong	620	356	130	120	106	109,943
6	Xang Dau Cat Lai	90	1,100	1,100			
7	Saigon Petro	134	808	808			
8	Saigon New	2,168	20,180	9,751	10,429		2,018,104
9	Sai Gon	1,819	13,166	5,413	2,845	4,908	510,496
10	Tan Thuan Dong	141	556	498	36	22	
11	Ben Nghe	857	4,199	1,512	500	2,187	188,815
12	VICT	1,015	5,360	2,670	2,690		536,176
13	Rau Qua	136	308	294	14		
14	Lotus	411	1,134	1,040	94		24,252
15	Nha Be Oil	213	4,500	4,500			
16	My Tho	184	286	17	81	188	
17	Dong Thap	33	184	25		159	
18	Vinh Long	10	179			179	
19	Can Tho	1,388	2,843	263	2,074	506	10,692
20	Binh Minh	12	190			190	
21	Tra Noc – Can Tho	385	2,926	32	2,329	565	
22	Cai Cui	324	2,554	3	2,359	192	
23	My Thoi	292	1,442	141	164	1,137	30,541
TOTAL		30,367	143,612	46,592	54,182	42,838	5,030,808

Source: Vietnam Seaport Association and Port operator data by VINAMARINE



Viet Nam has 80 seaports in 8 categorized seaport groups. The major seaports in Viet Nam are illustrated in Figure 2.2.7. In 2009, the construction of Van Phong Port started aiming for deep-sea transshipment hub port.



Source: VINAMARINE and Study Team

Figure 2.2.7 Major Seaports in Viet Nam



#### 4) Shipping Route and Line in the Northern Seaports

In 2008, the Northern Seaports in Viet Nam acted as only feeder ports, no deep-sea ports for trunk line vessels. Therefore, most of the Vietnamese export or import cargoes without deep-sea port in Southern Vietnam were transported to the neighboring hub ports where the vessels sailing on trunk line could call, such as ports of Hong Kong and Singapore, and then transshipped to the mother vessels and transported to the destination ports (Figure 2.2.8).



Source: ASEAN Logistics Network Map, 2<sup>nd</sup> Edition 2008, JETRO, Arrangement by JICA Study Team

**Figure 2.2.8 Trunk and Feeder Shipping Routes of Viet Nam's Seaports**

In 2009, the shipping schedule of Hai Phong Port has 43 liner service routes, 22 routes via Hong Kong port and 7 routes via Singapore Port. The maximum onboard capacity is 3,252 TEUs. (Table 2.2.2)

Table 2.2.2.2 Liner Service in Hai Phong Port (as of November 2009)

No.	Shipping Line	Service Code	Type of Service	Frequency	Fixed Date Service	Total Vessel	Shipboard Capacity	Service Partners	Shipping Route	Days of Round Trip
1	Advance Container Lines (Pte) Ltd	North Vietnam Exp	Feeder service	2 sailings a week	Yes		938 TEU	Advance Container Lines (Pte) Ltd	Singapore (PSA) - Haiphong - Da Nang - Qui Nhon - Singapore (PSA)	14
2		Vietnam-Singapore	Feeder service	1 sailing a week	No	4	3,232 TEU	Samudra Shipping Line Ltd	Haiphong - HCM - Singapore (PSA) - HCM - Haiphong	14
3	Ben Dong Shipping Co	Vietnam-Hong Kong	Feeder service	3 sailings a week	Yes	3	1,285 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong	7
4		Vietnam-Thailand	Feeder service	1 sailing a week	Yes	2	1,154 TEU	Ben Dong Shipping Co	Haiphong - HCM - Bangkok - Laem Chabang - HCM - Haiphong	14
5		Vietnam-Korea	Feeder service	1 sailing a week	Yes	1	422 TEU	Ben Dong Shipping Co	Haiphong - Busan - Haiphong	14
6	Cosco Container Lines Ltd	HHP	Mainline service	1 sailing a week	Yes	1	170 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
7	China Shipping Container Lines Co Ltd	CHW-HK-Haiphong	Mainline service	1 sailing a week	Yes	1	556 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
8	CT Navigation SA	Vietnam	Feeder service	1 sailing a week	Yes	1	525 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
9	China United Lines Ltd	SVG	Feeder service	1 sailing a week	Yes	1	629 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
10	Evergreen Line	KHP	Mainline service	1 sailing a week	Yes	1	629 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
11		HHS	Feeder service	1 sailing a week	Yes	1	629 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
12	Gold Star Line Ltd	HKS	Mainline service	1 sailing a week	Yes	1	1,306 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
13	Harbin Shipping Co Ltd	HPS	Mainline service	1 sailing a week	Yes	1	1,306 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
14		HPS1	Mainline service	1 sailing a week	Yes	2		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
15	Beng-A Shipping Co Ltd	HPS2	Mainline service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
16	Hub Shipping Sdn Bhd	Pag-Hph-Hon-Pag	Feeder service	1 sailing a week	Yes	1	700 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
17		GIMCO-2	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
18	Kawasaki Kisen Kaisha Ltd	GIMCO-3	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
19		NNN2	Feeder service	1 sailing a week	Yes	2	1,775 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
20	MCC Transport Pte Ltd	NNN4	Feeder service	1 sailing a week	Yes	1	1,128 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
21	Marine Express Lines Ltd	KHX	Feeder service	2 sailings a week	Yes	2	1,404 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
22		TVS	Mainline service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
23		VH2	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
24	Minou OSK Lines Ltd	VSS	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
25		VH3	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
26		VH4	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
27	Mediterranean Shipping Co SA	Tongking Express	Feeder service	1 sailing a week	Yes	1	3,157 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
28	Samsung Shipping Co Ltd	Vietnam Haiphong	Mainline service	1 sailing a week	Yes	2	684 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
29	Orient Overseas Container Line Ltd	RHX	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
30		KVX	Feeder service	1 sailing a week	Yes	1	1,049 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
31	STX Pan Ocean Co Ltd	HGX	Feeder service	1 sailing a week	Yes	1	1,118 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
32	PDZ Lines	HGX	Feeder service	1 sailing a week	Yes	1	984 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
33		HGX	Feeder service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7
34		RHP	Mainline service	1 sailing a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
35	Regional Container Lines Public Co Ltd	RSK	Mainline service	1 sailing a week	Yes	1	1,884 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	21
36		RSX	Mainline service	1 sailing a week	Yes	2	2,228 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
37	Russo-Orient Shipping Line Co Ltd	Russo-Orient Exp	Mainline service	2 sailings a week	No	1	1,054 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
38	Samudra Shipping Line Ltd	NVX	Feeder service	1 sailing a week	Yes	1	300 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
39	Shimoda Merchant Marine Co Ltd	HHS	Mainline service	1 sailing a week	No	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
40	STC Container Lines Co Ltd	CIV	Mainline service	2 sailings a week	Yes	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	14
41		Sea Container Pte Ltd	Mainline service	2 sailings a week	No	1		Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	6
42	Valencia Shipping Co	HCM-HPH	Feeder service	5 sailings a week	No	1	2,225 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	6
43	Wan Hai Lines Ltd	WPHH2	Mainline service	2 sailings a week	Yes	2	1,292 TEU	Ben Dong Shipping Co	Haiphong - Hong Kong - Haiphong - Chuan	7

Note: Vessel Sides of Shipping Lines



### 5) Vietnam-China Border Transport in the Northern Vietnam

Vietnam-China border regions have effectively cooperated in transport, tourism, culture and education. In 2003, the Greater Mekong Subregion (GMS) Cross-Border Transport Agreement (CBTA) entered into force for a multilateral legal instrument among GMS countries (Cambodia, People's Republic of China [PRC], Lao People's Democratic Republic [Lao PDR], Myanmar, Thailand and Vietnam).

In 2005, a new highway connecting Nanning National Route 1 in Vietnam was opened. In 2007, China and Vietnam agreed to construct an economic cooperation zone astride the boarder at Pingxiang city, Guangxi and Lang Son province in Vietnam. In 2008, Vietnam and China signed MOU to include the Nanning-Hanoi corridor and the Youyiguan-Huu Nghi Border Crossing Point under the umbrella of the GMS Cross-Border Transport Agreement.

In 2007, the regular scheduled road transport service from Hanoi to China has begun and then, using the return transport, the consolidation service for multi customers also started. In 2008, for facilitation of the movement of Chinese goods, Vietnam Government has the planning of six-lane expressway from Hanoi to Lang Son to connect with Guangxi.



Source: GMS Transport Strategy 2006-2015, ADB

Figure 2.2.9 New GMS Corridors



Figure 2.2.10 shows the present condition of sea and land transport of Hanoi-Guangzhou. After opening Nanning - Youyiguan expressway in the end of 2005 and opening Nanning - Zhanjiang - Guangzhou around the same time, the sea transport cost of Hanoi-Guangzhou is half price of the land transport cost, but the sea transport days are 1.5 times longer than land transport days.



Source: JETRO

Figure 2.2.10 Sea and Land Transport from Hanoi to Guangzhou Area

Table 2.2.3 shows major economic data (2008) of Guangdong and Guangxi province in China. GDP growth in both provinces is more than 10%, even if after global economic crisis in 2008.

Table 2.2.3 Major Economy Data of Guangdong and Guangxi Province (2008)

Province	Guangdong	Guangxi
Capital	Guangzhou	Nanning
Area	179,800km <sup>2</sup>	236,700 km <sup>2</sup>
Population (end of 2007)	94,490,000	50,020,000
Population density	526 /km <sup>2</sup>	210 /km <sup>2</sup>
GDP	CNY 3,569.6 billion	CNY 717.2 billion
GDP Growth	10.1%	12.9%
Per capita	CNY 37,588	CNY 14,966

CNY=approx 13Yen, 1 Dong=approx. 0.005 Yen (Dec 2009)

Fangcheng Port in Guangxi province is one of major 24 ports in China. Fangcheng port has 36 berths including 21 deep-sea berths of more than 10,000 ton vessel accommodation and maximum berth capacity with 200,000 ton vessel accommodation. 11 deep-sea berths for 50,000 to 200,000 ton vessel accommodation is under-construction now. Target capacity of Fangcheng Port North International port group (Fangcheng Port, Qin Zhou port and BeiHai port) is 100 million ton in 2010 and 300 million ton in 2020.

Ranking of GDP for Greater Pearl River Delta (Guangzhou, Hong Kong, and Macau) is eleventh in the World. In the TEU-ranking of the container ports in 2008, Hong Kong is No. 3 (24.2 million TEU), Shenzhen is No.4 (21.4 million TEU) with 27.1% growth rate in 1998-2008 and Guangzhou is No. 8 (11.0 million TEU) with 29.2% growth rate in 1998-2008. (Table 2.2.4)



**Table 2.2.4 TEU-ranking of the top 10 world container ports in 2008**

TEU-Ranking		Port (Country)	Mill TEU			TEU% Growth	
2008	(1998)		1998	2007	2008	2007-2008	1998-2008
1	(1)	Singapore (Singapore)	15.1	27.9	29.9	7.1%	7.1%
2	(10)	Shanghai (China, PR of)	3.1	26.2	28.0	7.0%	24.7%
3	(2)	Hong Kong (China, PR of)	14.6	24.0	24.2	1.0%	5.2%
4	(18)	Shenzhen (China, PR of)	2.0	21.1	21.4	1.5%	27.1%
5	(5)	Busan (Korea, Rep of)	5.2	13.3	13.4	1.4%	10.0%
6	(11)	Dubai (UAE)	2.8	10.7	11.8	11.1%	15.5%
7	(64)	Ningbo (China, PR of)	0.4	9.4	11.2	19.0%	41.3%
8	(52)	Guangzhou (China, PR of)	0.8	9.3	11.0	18.8%	29.2%
9	(4)	Rotterdam (Netherlands)	6.0	10.8	10.8	-0.1%	6.0%
10	(35)	Qingdao (China, PR of)	1.2	9.5	10.3	9.1%	23.9%

Source: ISL Port Data Base 2009

Moreover, 3 major ports (Guangzhou, Shenzhen and Xiamen) in Pearl River Delta have planning huge development in the future. Table 2.2.5 shows actual volume of cargo and container cargo and future development plan in Chinese major ports.

**Table 2.2.5 Chinese Port Development Plan**

Chinese Port	Actual Data		Development Plan					Remarks
			2010		2020		2030	
	Cargo Volume (mil. ton)	Container Cargo (mil. TEU)	Cargo Volume (mil. ton)	Container Cargo (mil. TEU)	Cargo Volume (mil. ton)	Container Cargo (mil. TEU)	Cargo Volume (mil. ton)	
Guangzhou	Year 2008							
	347	11.0		14.0				
Shenzhen	Year 2008							
	211	21.4	280	28.0	440		480	
Shekou	Year 2007							Shenzhen Area
	54.3	5.0						
Yantian	Year 2007							Shenzhen Area
	54.3	10.0						
Xiamen	2007	2008			Future Volume			
	81.2	5.0	120	10.0	260-290 ton	17-19		
Qingdao	Year 2008							
	300	10.0	320	12.0	450	22		
Tianjin (Tientsin)	Year 2008							
	356	8.5						
Shanghai	Year 2008							
	508	28.0						
Nantong	Year 2007							
	120	0.43	200	1.5				
Lianyungang	Year 2008							
	101	3.0	120	3.4	190	8.0		
Ningbo	Year 2008							
	520	10.9		11.0				
Yantai	Year 2008							
	111	1.5	200	2.5~3.0				
Dailian	Year 2008							
	246	4.5	250	8.0				

Source: KWE Kintesu World Express, Inc.

### 2.2.2 Ocean Shipping

Vietnam has 126 ports along their 3,260 km coast line, and 24 ports of them are opened for international trade. Shipping lines have liner services only in six ports out of the 24 ports, namely, Ho Chi Minh, Vung tau, Hai Phong, Cai Lan, Quy Nhon, and Danang.

There are three trunk lines in the world shipping industry. They are Far East - Southeast Asia - Europe, Southeast Asia - Far East - USA West coast, and USA East coast - Europe routes. Vietnamese ports are geographically included in the above former two trunk routes covering Asia. Despite their geographical locations, no Vietnamese ports are listed in the published shipping schedule as calling ports by the shipping lines operating Asia/USA and Asia/Europe direct services at the moment. Vietnamese cargos from / to the origins / destinations on the above trunk routes are still transshipped at the hub ports where the trunk line vessels call.

The reason of this situation is that Vietnamese ports are too shallow and small to receive large container vessels, and container volumes handled in the ports did not satisfy the space of large vessels at one calling until a few years ago. However, recently Vietnam has grown to become the “world’s factory” after BRICs countries, therefore, cargo volume jumped up by development of manufacturing and consuming power.

Ho Chi Minh area had been an only surpassing big location in Vietnam until several years ago. Hai Phong and Cai Lan ports appeared recently on the stage as the 2nd key port in this country, which is regarded as a gate for not only North Vietnam but also northern part of Indo-China countries like as North Thailand and Laos, and the border area of China. Both ports, however, are not incorporated in the trunk lines, neither in Asia/USA nor Asia/Europe route yet.

Since 2004, the container throughput in Hai Phong and Cai Lan have increased average 38% every year until 2008, and still continues to grow.

The deployed vessels are greater than 1,000 TEU and applicable for feeding the panamax/post panamax container vessels. They are also servicing markets and area where the demand for large container vessels is too low. Such size are deployed into near seas navigation route around South East Asia, as panamax/post panamax size vessels are not into South East Asia/ USA route including Hai Phong. Propulsion trends in container vessels are prevailing due to high fuel oil price and the following cost to vessel operation and port charges increase.

The size of feeder vessels are getting larger, as the feeder transportation demand from hub to feeder ports increases. This is because post panamax / panamax size vessels currently appeared on most main route in Asia

The existing routes served by the shipping companies calling at Hai Phong / Cai Lan and the vessel size are shown on the following map (Figure 2.2.11) with colored line in respective vessels’ container loading capacity. This map was organized from the following table (Table 2.2.6), which shows the service nets and details of the deployed vessels.

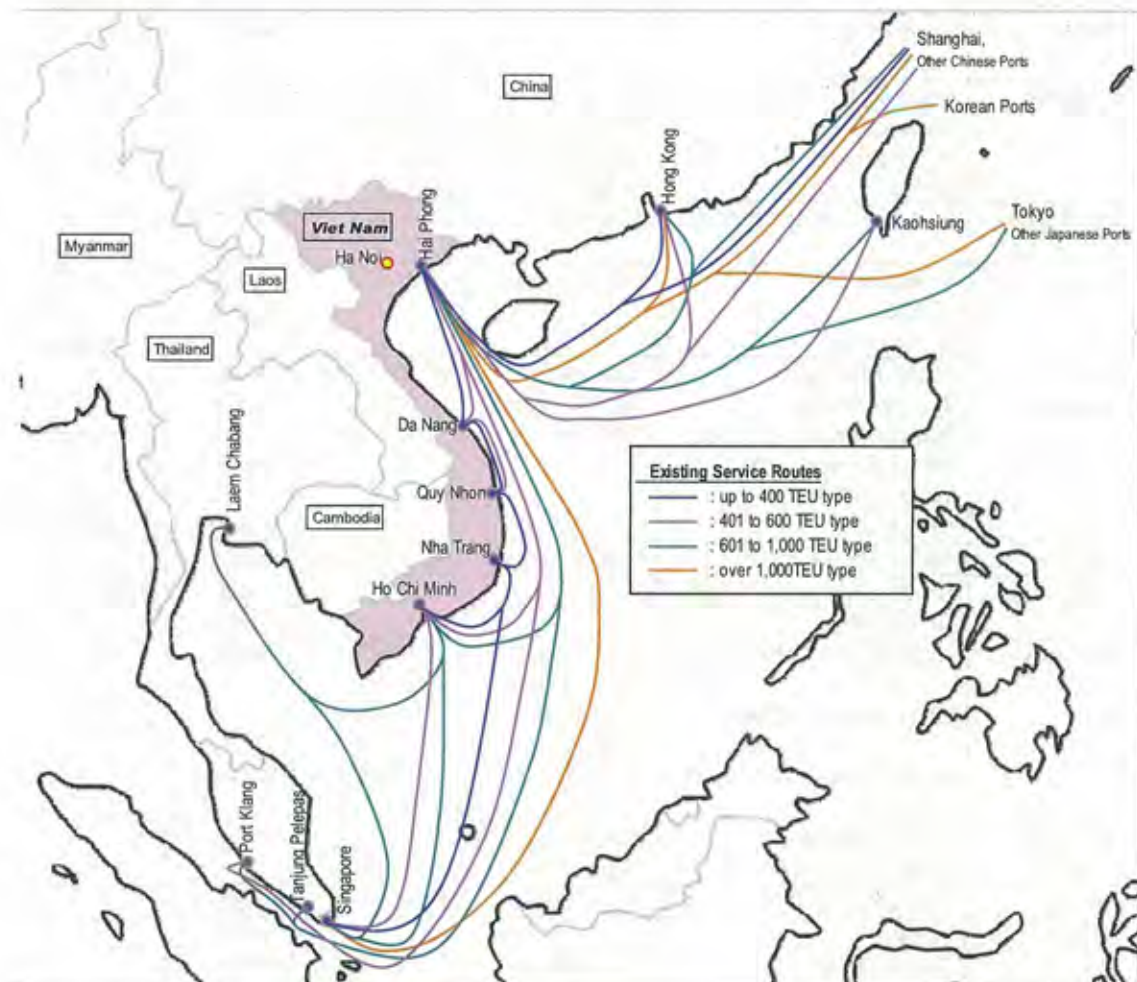
It is shown that most vessels in this route are 500/600 TEU type, and basically serving weekly. It can be found that the world major shipping companies have slot charter contract with regional feeder shipping companies, or have joint service as a partner.

Slot charter is to buy partial space from an owner, and partner is to throw their own vessels together into a group to maintain a round service.

It also shows that they connect the neighboring and closed ports/countries each other by deploying small size of container vessels, and containers are relayed from/to the trunk service at the hub ports, where are Kaohsiung, Chinese ports and Singapore. There is currently no direct service between India,



Europe and USA, and Hai Phong/Cai Lan. A few direct services are towards Far eastern countries, Japan and Korea.



Source: Study Team

Figure 2.2.11 Existing Service Route

Table 2.2.6 Service Type and Vessels calling at Haiphong

Shipping Cos. In Service	Route	Vessels Name	Loading Capacity	Frequency	P: Partners SC: Slot Charter
APL	SP/HCM/SP	"Cape Arago" "Westerhever"	FC 1,066 TEU FC 1,572 TEU	2 /Week	P: ACL
China Shipping	Chiwan/HK/HP/Chiwan	"Su Peng"	MP 170 TEU	Weekly	
COSCO	HK/HP/Zhanjing	"Bei Hai"	MP 602 TEU	Weekly	P: Sinotrans SC : Gold Star
	HP/Danang/QuiNhon/SP HP/HK/HP			Weekly	SC: COSCON P: Sinocor
Evergreen	Kaohsiung/HP/Kaohsiung	"Da Ping" "Dong Du"	MP 602 TEU FC 566 TEU	Weekly	
Gemartans	HP/Kaohsiung/HK/HP HP/HK/HP HP/QuiNhon/HCM/SP/HCM/ HP HP/Danang/QuiNhon/SP/HP	"Vinalines Pioneer" "Matura II"	FC 588 TEU FC 534 TEU	Weekly Weekly 2/Week	SC: K P: K, TS,SC: Cosco P: Cosco, etc. SC: Coscon

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Shipping Cos. In Service	Route	Vessels Name	Loading Capacity	Frequency	P: Partners SC: Slot Charter
Hanjing	Busan/HK/HP/ Busan			Weekly	SC: Hanjing, MOL
Heung A	Gwanyang/Busan/HK/HP/ Fangcheng/HK. HP/Fengchang/ Shekou	"Heung A Bangkok" "Heung A Singapore" "Heung A Hong Kong" "El Bravo"	FC 653 TEU FC 653 TEU FC 650 TEU FC 1,118 TEU	Weekly	
Hub Shipping	PKelang/HCM/HP/PKelang	"Hub Enzo"	FC 818 TEU	Weekly	P: CNC, Gemartrans
K Line	Kaohsiung/HP, HP/HK, HP/Kaohsiung/HCM/HP	"Vinalines Pioneer"	FC 588 TEU	2/Week Weekly	P: Wan Hai SC: Gemartrans P: Gemartrans
MCC Transport	SP/HP/T Pelepas, TPelepas/SP/HP/ Danang/NhaChang/TPelepas/ HP/HK/Kaohsiung/HP TPelepas/SP/HP/ Qui Nhon/SP	"Fesco Ayon" "MCC Confidence" "MCC Proteus"	FC 1,102 TEU FC 543 TEU FC 653 TEU	Weekly Weekly Weekly	P: Evergreen P: Evergreen P: Evergreen
MSC	HK/HP/Shantou/HK	"MSC Wellington"	FC 1,271 TEU	Weekly	
MOL	HK/HP/Chiwang/HK, HP/HK/HP			Weekly Weekly	SC: Bien Dong
Bien Dong	HP/HCM/SP/HCM/HP/HCM  HP/Fengchang/HK/HP,  HP/HCM/BKK/LC/HCM/HP	"VinashinFreighter" "Vinashin Trader" "Van Hung" "Van Ly" "Bien Dons Star" "Van Phuc"	FC 610 TEU FC 610 TEU FC 420 TEU FC 357 TEU FC 750 TEU FC 404 TEU	Weekly  2/Week  Weekly	P: MOL  SC: MOL
Nam Sung	Korean Ports/HK/HP/ Shekou/Xiamen/Inchon	"Bonny Star" "Happy Star"	FC 342 TEU FC 342 TEU	Weekly	
OOCL	HP/Kaohsiung/HP	"Grand Ocean"	FC 560TEU	Weekly	
RCL	SP/HP/SP			Weekly	
RSK	Shekou/SP/HP/ HK/Xiamen	"Ocean Bhum" "Resourceful"	FC 1,114 TEU FC 1,114 TEU	Weekly	
Samdera/ Advance CL	SP/HP/Danang/QuiNhon/SP HP/Chiwang/HK HK/HCM/HK	"Sinar Padang" "Kota Ria" "Kota Rakyat"	FC 400 TEU FC 938 TEU FC 938 TEU	Weekly	P: MOL
Sinocor Merchant Marine	HK/HP/HK	"Hua Sha"	MP 300TEU	Weekly	
SITC CL	Japanese Ports / Shanghai/HK/HCM/ HP/Tokyo	"Josco Lily" "SITC Tokyo" "Trinity"	FC 1,049 TEU 847 TEU 907 TEU	Weekly	
NYK  RCL	Guangzhou/Cai Lan/HCM HCM/Cai Lan/HK/Japan. ports Songkhla/HK/HP/HK	"ACX Lilly" "Asian Gyro" "Pira Bhum" "Ratha Bhum" "Supa Bhum"	1,404 TEU 1,032 TEU FC 628 TEU FC 628 TEU FC 628 TEU	Weekly  Weekly	P: Tokyo Senpaku P: Tokyo Senpaku
TS Lines	Shekou/HK/Fangcheng /HP/Fangcheng, Fangcheng/HP/Chiwang			2/week	P: CU Lines
Vinalines	HCM/HP	Various	MP/FC 215/556 TEU	5/week	



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Shipping Cos. In Service	Route	Vessels Name	Loading Capacity	Frequency	P: Partners SC: Slot Charter
Vinashin Ocean Shipping	?	"Vinashin Express 1"	MP 567 TEU	?	
Wan Hai	HP/Kaohsiung/HP	"Venus C" "Tai Ping"	FC 816 TEU ? TEU	Weekly	P: K Line, SC: Coscon, Evergreen, MOL

Source: Containerization International Year Book 2009 and International Transportation Handbook 2009  
HP : Hai Phong, HCM: Ho Chi Minh, SP: Singapore, HK: Hong Kong, LC: Laem Chabang, BKK: Bangkok  
SC: Slots Charter, P: Partners, FC: Full Container Ship, MP: Multi-purpose Ship

From the above table (Table 2.2.6), the actual substance of the service around Hai Phong area and the connecting transportation would be cleared. Only Tokyo Senpaku, under the name of NYK launched service on calling at Cai Lan since 2004 and has twice a week service with middle size container vessels, and MSC did in 2009. The containers of these lines are transported between Hai Phong and Cai Lan by motor barges and other provinces by trucks.

Now the cargo movement Asia/Europe is growing more than Asia/USA in percentages, it is said, and some Chinese shipping line swapped the fleet of post panamax size deployed in USA route for Europe route.

But there is little possibility for Far East Asia/Europe line vessels to call directly at Hai Phong due to several days' deviation from the usual navigation route at moment. Cargo transportation pattern between Vietnam/Europe will be transshipped at the hub ports like as Singapore for another several years, too, unless the new line which is originated from Hai Phong.

For eastbound cargo, there is possibility that panamax or post panamax size of container vessels will extend her service route to Lach Huyen from China and Taiwan area, especially on completion of expansion of width in Panama Canal which is to be completed in 2014, since many shipping lines maintain South China/USA west coast service by such size of vessels now.

The following table (Table 2.2.7) shows the respective operation group and their vessels of container loading capacity at present. Some vessels out of the fleet will be feasible to call at Lach Huyen on opening of the new modern container terminal. The service between Asia and US East coast via Suez Canal is excluded from this list. Such westbound routes have recently commenced due to avoiding heavy congestion of Panama Canal and escalation of Canal toll, of which amount is appropriated for the construction of new canal.

The existing calling situations of the shipping service in Hai Phong and Cai Lan are as follows:

- (1) Water depth in Hai Phong Channel is 7.8m, which can accommodate approximate 10,000 DWT container vessels to be equivalent to 500/600 TEU with full load condition in spite of tidal condition, and moreover, there is no big container terminal here which has capacity to handle huge volume of containers quickly at present. In so way, the smaller type of vessels, therefore, are deployed, or around 1,000 TEU type vessels come on berth Hai Phong in not full load, with empty containers/vacant space. The channel through Cai Lan is deeper than to Hai Phong, 12m in depth, but small volume of cargo is concentrated.
- (2) There have been not enough containers accumulated to handle the large size vessels in a short stay on the berth in one calling. The smaller sizes and frequency services have compensated for the above situation.
- (3) The terminal is indispensable to make the shipping lines learn container productivity at quay side for keeping their service schedule as their planning. But they will not be able to catch operative condition at the existing port. Only modern equipment and facilities can perform the steady and

expeditious container handling with skillful operation.

- (4) Approximately there are several days' deviations from the regular course on Kaohsiung or Shanghai/Singapore/Europe to the location of Hai Phong port. The shipping companies cannot deserve this extra navigable time and expenses for their accounts and Asia/Europe clients. Connecting feeder vessels can compensate their loss time with transshipment at neighboring hub ports from Hai Phong.

All the other items but No. 4 out of the above descriptions can be solved on construction of the new container terminal in Hai Phong area and how to operate it to fascinate and to induce the users are essential for port of Lach Huyen.

**Table 2.2.7 Existing PRC (Asia) /USA Service**

Group Name	Organized Members	Capacity of Deployed vessels	Typical Vessels' names Deployed	
TNWA	MOL, APL, Hyundai	2,996 - 6,479 TEU	MOL Miracle	2,996 TEU
			APL England	5,508 TEU
			Hyundai Dominion	6,479 TEU
Grand Alliance	NYK, Hapag-Lloyd, OOCL	2,893 - 8,060 TEU	NYK Springitde	2,893 TEU
			Dresden Express	4,639 TEU
			OOCL Hamburg	8,063 TEU
CKYH	Coscon, K Line, Yang Ming, Hanjin	2,702-5,576 TEU	COSCO Panama	2,702 TEU
			Chicago Bridge	5,576 TEU
			YM Prosperity	3,266 TEU
			Hanjin Osaka	4,024 TEU
Maersk	Maersk	1,129 – 6,600 TEU	Astor	1,129 TEU
			Albert Maersk	6,600 TEU
Evergreen	Evergreen	2,728 – 7,024 TEU	Ever Gifted	2,728 TEU
			Ever Shine	7,024 TEU
CMA CGM	CMA CGM	4,298 – 8,600 TEU	CMA CGM Galaxy	4,298 TEU
			CMA CGA Courage	8,600 TEU
China Shipping	China Shipping	4,250 – 5,688 TEU	Xin Dan Dong	4,250 TEU
			Xin Yan Tai	5,688 TEU
MSC	MSC	873 – 8,034 TEU	MSC Immacolata	873 TEU
			MSC Beijing	8,034 TEU
CTP	Wan Hai, PIL	2,495 – 4,250 TEU	Wan Hai 302	2,495 TEU
			Wan Hai 509	4,250 TEU
China Express	China Express, Matson	1,970 – 2,524 TEU	R J Pfeiffer	1,970 TEU
			Manukai	2,524 TEU

Source: MOL's data & Containerization International Year Book 2009

Northern Vietnamese ports, comparing to the southern ports, the service frequency had been poor till the several years ago. Naturally, it is not always dominant in physical and geographical location, and the trade container volume. However the service numbers of the shipping companies to Hai Phong/Cailan are increasing due to the recent jumping up of container volume. The following table shows the new joiners and the increase of frequency in services 2006 vs. 2010.

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Table 2.2.8 Service Variation of Type and Vessels calling at Hai Phong/Cai Lan in 2010 & 2006

Shipping Lines In Service	2010				2006			
	Route	Frequency	Partners	Vessels in Service	Route	Frequency	Partners	Vessels in Service
ACL	SP/HP/Danang/Quinhon/ SP	Weekly		Kota Machan 606 TEU Kota Ria 938 TEU	Same as 2010	Weekly		Jatianom 459TEU Kota Bintang 476 TEU
APL	Feeder from Kao, HK, SP, or Chiwan	Weekly		Nil	Nil	Nil	Nil	Sinar Padang 495 TEU Cape Arago 1066 TEU
Biendong	SP/HCM/HP/HCM/SP	Weekly	SC:MOL	Vinashin Mariner Vinashin Navigator 1016 TEU	Nil	Nil	Nil	Nil
	HP/HK/HP	Weekly	SC:MOL					
	Kao/HP/Kao	Weekly	SC: Y.Ming	Mell Senang 698 TEU Mell Seraya 704 TEU	Nil	Nil	Nil	Nil
Chien Lie (CMA CGM)	Kao/HP/Kao	Weekly	SC: TS Lines Wan Hai	Kuo Chang, Kuo Chia, Kuo Fu, Kuo Yu 1295 TEU				
ECL	Yoko/Nya/Kobe/HP/HK M	1-2/month			Same as 2010	1-2/month		
Evergreen	Kao/HK/HP/Kao	Weekly	SC: Wan Hai	Rio Lawrence 1155 TEU	Nil	Nil	Nil	Nil
Gold Star	Shekou/HK/HP/Shekou	Weekly		Xiao Yun 300TEU	Nil			
Hanjin/ Sinotrans	Busan/Shai/HP/Shai/ Busan/	Weekly		Appen Charlotte 1043 TEU Sinar Bintan 1060 TEU	Nil			
Heung-A	Kwang Yang/Busan/HK/ HP/Shekou?HK/Kwang Y	Weekly		DS Ability 1118 TEU Heung A Bangkok 650 TEU	Same as 2010	Weekly		Hueng-A Bangkok Hueng-A Hong Kong 650 TEU
Hyungdai/ Spic/TSK	Feeder service from HCM				Nil			
Kambara Kisen	Feeder service from Shanghai	Weekly			Nil			
KL/Wan Hai/ GEMCO	HK/HP/HK Another feeder service From HK	Weekly		Vinalines Pioneer 588 TEU	Kao/HP/Danang/ HC Another feeder service fm HK	Weekly	GEMCO Loop 1	Gematrans Pioneer Van Phong 585/563 TEU
KMTC/STX Pan Ocean	Busan/Kwang Yang/HP/ Xiamen/Shai/Busan	Weekly		Lantau Breeze 1049 TEU MareAdriaticum 1054 TEU	Nil			

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Maerks	Feeder service from Kao	Weekly			Feeder service from HK or Kao			
Manui (Ro/Ro)		6-8/month			Nil			
MOL	Feeder service from HK				Feeder service from HK			
Nam Sun	Inchon/Busan/HK/HP/HK/Shekou/Xiamen/Inchon				Nil			
OOCL	Kao/HP/Kao	Weekly			Nil			
PIL	Feeder service from Shanghai				Feeder service from SP			
RCL	SP/HP/HK/Fencheng/SP	Weekly			Nil			
SITC	HP/HK/Xiamen/Shai Shi/Japanese Ports/Busan/ Shai/Keelung/HP Incheon/Pyongtaek/Shai/HK/HP/Xiamen/Incheon				Nil			
TS Lines	Feeder from Kao by Chien Lie Line				Nil			
Toko	Yoko/Kobe/HP/HCM	2-3/month			Japanese ports/HP/HCM	2-3/month		
TSK	Feeder from Kao Japanese ports/Nansha/Cailan/HCM/SP/Jakarta/HCM/Cailan/HK/Tokyo	2/week			Japanese ports/ Shai/HK/Huangpu/ Cai Lan/HCM/ Shekou/HK/Tokyo	Weekly		ACX Cherry ACX Cosmos 1241 TEU Sunrise 1181 TEU
Wan Hai	Kao/HP/Kao	2/week			Same as 2010	Weekly		Padma 734 TEU
Dongnama					Feeder from HK	Weekly		
Hapag					Feeder from SP			

Source: International Transportation Handbook 2010 & 2006

HP: Hai Phong, HCM: Ho Chi Minh, SP: Singapore, HK: Hong Kong, Kao: Kaohsiung, Shai: Shanghai

SC: Slot Charter, P: Partner

### 3. Present Situation of Ports

#### 3.1 Northern Sea Ports

Until now the sea ports in Vietnam were divided into eight (8) groups, however, by the new Master Plan for Vietnam Seaport System Development till 2020 orientation to 2030, they are re-grouped into six (6). The ports concerning this SAPROF study belong to the Group 1: North.

There are two big port groups in the Group 1, namely Hai Phong and Quang Ninh with national general ports of Hai Phong and Cai Lan and many local ports and dedicated ports. Total throughput in Hai Phong and Cai Lan ports in 2000 was 9.2 million tons and had strongly grown every year and reached to 29.8 million tons in 2008. However, seaport sales have not been facilitated because Hai Phong Port is located deep inside riverbank with a limited channel depth to the ports, and the industrial zone development and logistic facilities have not been developed yet synchronously in Cai Lan Port. There is no international gateway seaport in the region and big vessels are obliged to reduce load and transfer a part of cargo by barges before entering into the port.

##### 3.1.1 Quang Ninh Port Zone

###### 1) Quang Ninh Zone Ports

- Two (2) dedicated ports for coal of Cua Ong and Hon Gai servicing the whole nation's demand and export.
- Petroleum Port (B12) servicing northern regions.
- General Ports: Quang Ninh Floating Berth and Cai Lan Port.

###### 2) Cai Lan Port

Present condition of Cai Lan Port is summarized as shown in Table 3.1.1.

**Table 3.1.1 Facility and Equipment of Cai Lan Port**

Berth	Length	Depth	Cargo	Yard	Warehouse	Equipment
No.1	166m	-9.0m	Bulk/G.C.	14.2 ha	1.54 ha	Mobile Crane: 1x64t, 1x104t, RTG: 4x40t, 1x50t
No.5	220m	-12.0m	Bulk/G.C.			Rubber Tyre Crane 3x14t, 1x25t
No.6	220m	-12.0m	Bulk/G.C.			Ev Crane: 1x50t, Forklift: 2x7t, 3x8t
No.7	220m	-13.0m	Container			13 Chassis

Cai Lan Port was developed in Bai Chay Bay by dredging up to -9.0m to -13.0m. Berth No.5 to Berth No.7 were constructed by the Japan's ODA fund in 2004 and started container handling. However, during the past few years, throughput of container in Cai Lan Port had been decreased drastically because of damage of quay gantry container cranes by typhoon in 2006, but it has been recovering very quickly in this year.

Cai Lan Port shall be accessed through about 33km long approach channel of -10m deep in Ha Long Bay from the ocean and further deepening of the approach channel can not be expected from an environmental point of view.

Cai Lan Port is managed and operated by the Quang Ninh Port Company under the JV of Quang Ninh Province and VINALINES. Cai Lan Port has decided to develop No.2 to No.4 container berths by 2012 by the private fund of American developer. Throughput of Cai Lan Port during 2002 to 2009 is presented in Table 3.1.2.

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**Table 3.1.2 Throughput of Cai Lan Port**

TT	Criteria	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	11 months 2009
I	Bulk cargo capacity	Ton	1,533,130	1,525,911	1,563,232	1,623,215	2,335,059	3,177,937	3,738,540	2,967,566	3,339,618	4,686,722
II	Total passing cargo capacity	Ton	1,513,261	1,513,573	1,559,076	1,748,406	2,475,597	3,185,136	3,498,824	2,805,408	3,022,618	4,289,116
	Export	Ton	284,773	284,858	368,338	491,366	980,710	974,717	1,157,528	1,562,421	1,664,397	1,365,110
	Import	Ton	419,824	638,312	924,795	1,025,686	828,242	1,059,104	883,548	831,760	856,349	1,512,346
	Domestic	Ton	808,664	590,403	265,943	231,354	666,645	1,151,315	1,457,748	411,227	501,872	1,411,660
*	Container	teus	2,182	662	244	2,289	121,252	211,788	245,923	66,701	63,367	361,299
	Cargo container	Ton	0	0	0	1,121	55,320	93,151	113,360	32,220	30,147	129,882
	Export	Ton					11,673	14,359	18,669	10,752	11,259	21,868
	Import	Ton					15,477	39,558	30,166	15,724	17,310	51,257
	Domestic	Ton				1,121	28,170	39,234	64,325	5,744	1,578	56,757
	Non-bulk cargo container	Ton	2,182	662	244	47	10,612	25,486	19,203	2,261	3,073	41,535
	Export	Ton					1,568	6,547	2,388	176	2,278	17,755
	Import	Ton					354	1,047	2,930	84	122	1,529
	Domestic	Ton	2,182	662	244	47	8,690	17,892	13,885	2,001	673	22,251
	Details of passing capacity	Ton	1,513,261	1,513,573	1,559,076	1,748,406	2,475,597	3,185,136	3,498,824	2,805,408	3,022,618	4,289,116
1	Export	Ton	284,773	284,858	368,338	491,366	980,710	974,717	1,157,528	1,562,421	1,664,397	1,365,110
	Cargo container	Ton					114,820	216,166	263,748	150,542	225,180	306,152
	Non-bulk cargo container	Ton						43,340	6,045	440	5,895	248,570
	Oil	Ton	3,757	5,077	9,460	7,500	3,480	4,067	7,684	2,950	4,696	8,618
	Wood chip	Ton	16,771	7,516			9,621	251,204	374,688	493,617	416,996	285,851
	Wood	Ton							10,050	6,448	1,604	
	Stone (Tan Mai, Banpu)	Ton	51,103	75,436	73,040	90,014	73,127	72,160				
	Fertilizer	Ton								114,511	203,967	4,926
	Ore	Ton									291,025	126,729
	Steel	Ton									25,060	127
	Coal	Ton	213,142	170,359	285,838	387,728	779,620	378,266	450,223	781,655	457,664	370,313
	Clinker	Ton										
	Equipment	Ton									2,040	1,324
	Cement	Ton										12,500
	Construction material	Ton							39,182	9,146	29,968	
	Others	Ton		26,470		6,124	62	9,514	5,908	3,112	502	
2	Import	Ton	419,824	638,312	924,795	1,025,686	828,242	1,059,104	883,548	831,760	856,349	1,394,354
	Cargo container	Ton					228,500	614,205	347,785	226,289	346,200	717,598
	Non-bulk cargo container	Ton						8,230	7,325	210	305	21,406
	Oil	Ton			128,122	113,276	132,564	149,148	144,854	144,625	121,554	162,404
	Chemical	Ton							15,800	22,269	8,576	5,010
	Gypsum	Ton	6,311	48,134	40,401	137,393	40,637	6,100				
	Klinker	Ton		38,600	329,147	390,812	156,648					
	Wheat	Ton							176,137	168,693	32,987	
	Wheat flour	Ton									400	
	Barley corn	Ton		38,720	146,984	124,987	150,248	117,506				148,259
	Fertilizer	Ton		56,378	247,896	180,498	81,568	96,886	62,644	121,461	124,684	92,861
	Fertilizer in bags	Ton	290,477	425,384		12,025	3,838	21,837	15,466	100,172	75,018	
	Feedstuffs	Ton	61,828					15,041	75,765	17,576	57,098	185,205
	Equipment	Ton	6,118			43,678	13,858	10,426	27,145	21,085	3,327	5,269
	Scrap bundle	Ton					2,487	10,006		656	61,563	118
	Asphalt	Ton					7,760	9,540	7,498	14,524	17,448	
	Others	Ton	55,090	31,036	32,245	23,017	9,934	179	3,109		7,189	56,124
3	Domestic	Ton	808,664	590,403	265,943	231,354	666,645	1,151,315	1,457,698	411,227	501,845	1,411,660
*	Domestic export	Ton	726,905	558,937	260,888	221,840	371,269	778,496	774,177	322,399	200,986	796,117
	Cargo container	Ton					209,411	433,019	524,343	60,448	1,040	596,834
	Non-bulk cargo container	Ton						75,573	27,637	4,225	1,483	31,220
	Wheat	Ton	33,071	52,159	42,569	20,528	18,992	29,789	30,703	16,615	8,935	9,339
	Container	Ton										8,652
	Wood	Ton										3,228
	Oil	Ton							5,532	3,212	3,299	17,057
	Klinker	Ton	376,294	221,061	12,783	9,748	12,000	176,738	142,308	201,021	158,521	100,545
	Fertilizer	Ton								20,577	16,811	15,991
	Chemical	Ton								7,756		505
	Ore	Ton								3,130	5,269	
	Coal	Ton	107,412	115,875	35,000	26,767	20,885	38,938	9,416	140	1,000	
	Cement	Ton										4,779
	Steel	Ton										2,633
	Equipment	Ton								419	2,814	5,334
	Others	Ton	210,128	169,842	170,536	164,797	109,981	33,439	34,238	4,856	1,814	
*	Domestic import	Ton	81,759	31,466	5,055	9,514	295,376	372,819	683,521	88,828	300,859	615,543
	Cargo container	Ton	55,981	15,058	4,870		240,130	211,509	564,005	31,456	27,720	197,764
	Non-bulk cargo container	Ton						27,787	7,075	778	100	280,294
	Wheat	Ton									2,501	
	Oil	Ton						1,597		9,750	2,573	9,550
	Container	Ton										1,960
	Wood	Ton	24,723	3,607	185		30,666	106,031	97,582	33,434	25,039	12,665
	Barley corn	Ton					12,651		9,508	11,851	23,265	12,444
	Klinker	Ton								826		
	Ore	Ton									199,269	90,005
	Steel	Ton										795
	Equipment	Ton								658	3,169	7,396
	Construction material	Ton					11,919	25,895	5,351		17,223	
	Others	Ton	1,055	12,601						95		2,650
	Loading rate		1.01	1.01	1.00	0.93	0.94	1.00	1.07	1.06	1.10	1.09
III	Cargo Volume by transport line, including:											
1	By sea transport							2,707,366	2,974,000	2,384,597		
2	By road transport							477,770	524,824	420,811		
IV	Vessel quantity:											
1	By type											
	Passenger ship								479	493	516	416
	Bulk cargo ship								17	42	59	10
	Container vessel								292	323	347	255
									170	128	110	151
2	By capacity								0	493	516	
	Under 10,000T									250	333	198
	From 10,000 to under 20,000									148	97	82
	From 20,000 to under 30,000									63	59	80
	Above 30,000									32	27	56

### 3.1.2 Hai Phong Port Zone

Currently, seaport network in Hai Phong Port Zone located mainly along Cam Riverbank with about 17 major ports stretching on 7.8km bank. Total throughput of this port group in 2004 was about 13 million tons/year, mainly handled in Hai Phong Port (80% - 90%), and in 2008, within 4 years, it reached to 27 million tons/year.

Hai Phong Port is the largest international commercial port in Northern Vietnam and handling the second largest throughput in Vietnam following Saigon Port. Hai Phong Port includes four (4) loading zones which are planned for development as follows:

- Vat Cach Zone will be upgraded for a 650m berth, which can receive ship under 3,000DWT. This port will be domestic operation and act as a cargo transfer facility in Hai Phong Port.
- Hoang Dieu Zone with a 1,718m berth will be upgraded, which functions as a general port (general cargo and container zone incorporated with one international passenger wharf).
- Doan Xa Zone (with a 200m pier) will be repaired to maintain the function for general cargo. This zone can receive 5,000DWT vessels.
- Chua Ve Zone was developed for the first dedicated modern container port in the region. Rehabilitation of No.1 and No.2 berths and construction of No.3 berth were implemented by Japan's ODA fund as Hai Phong Port Rehabilitation Project Phase I during 1997 to 2001. Additional two (2) berths were also constructed by the Japan's ODA fund as Hai Phong Port Rehabilitation Project Phase II during 2001 to 2005.

Dinh Vu Zone will be developed for general cargo and container. The two (2) berths of Dinh Vu General Cargo Port are under operation. The first two container berths in Dinh Vu New Port were developed by private entity and under operation using tower cranes and the other 3 container berths are now under construction by Hai Phong Port.

Present situation of Hai Phong Zone Ports are summarized as shown in Table 3.1.3.

**Table 3.1.3 Facility and Equipment of Hai Phong Ports**

Berth	Length	Depth	Cargo	Yard	Warehouse	Equipment
Main Port (Hoan Dieu)						
1,2,3	413m	-8.7m	Container	29.63ha	3.01ha	Tower Crane: 26x5t-40t, Floating Crane: 2x10t-85t, RTG: 6x 25t-50t Forklift: 36x3t-45t
4 - 11	1,304m		G.C			Tug/Service Boat: 8x305CV-3,200CV, Weighbridge: 4x80t Automatic Filling Line 8x3,500t/day/ship
Chua Ve Container Terminal						
1-5	848m	-8.4m	Container	18.87ha	0.6ha	QGC: 6x35.6t Tower Crane: 5x5t-40t RTG: 12x35.6t, Rubber Tyre Crane: 2x25t-50t Forklift: 22x3t-45t Weighbridge: 1x80t
Doan Xa Port						
1	220m	-7.8m	Container	6.5ha	0.12ha	Tower Crane 2x40t, 1X10t, Forklift Truck 3x5t, 1x10t, 4x45t, Crane 1x16t

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Berth	Length	Depth	Cargo	Yard	Warehouse	Equipment
Dinh Vu General Port						
1	237m	-9.3m	G.C.	23.64ha	0.36ha	Tower Crane: 3x40t
2	188m	-9.3m	G.C.			Top Lifter: 3x45t Rubber Tyred Crane: 1x25t
Dinh Vu New Port						
1	200m	-10.2m	Container	56.9ha	0.1ha	Tower Crane: 2x5t-40t
2	200m	-10.2m	Container			
3-5	200m	-10.2m	Container			*Under Construction /2010
Vat Cach Port						
1-6	485m	-4.0m/- 4.7m	G.C.	21ha	0.72ha	Shore Crane: 11x5t-36t Forklift: 4x4t-7t Truck: 9x5t-16t Excavator: 1
Cua Cam Port						
1-4	350m	-2.5m/- 7.0m	G.C.	2.7ha	1.17ha	Shore Crane: 4x7.5t-16t Rubber Tyre Crane: 4x16t-36t Crawler Crane: 1x25t
Transvina Port						
1	165m	-7.8m	Container	5.1ha	0.12ha	Harbour Mobile Crane: 1x100t Tower Crane: 1x40t Forklift 3x45t, 1x5t Lift Truck: 6x3t-10t Container Truck: 15x10t-30t Tug Boat 1x800HP, 1x1600HP
Green Port						
2	320m	-8.0m	Container	4.73ha		Slewing Gantry Crane: 2x40t Mobile Crane: 2x40t Straddle Carrier: 4x40t Tug Boat: 1x70t
Le Chan Port						
1	144m		Container	6.65ha		2 Jib Cranes

Hai Phong ports are located along the maritime access channel of 42.8km from Buoy No. Zero and its depth is kept to -7.3m up to Dinh Vu Port and to -5.5m up to central terminal. The average tidal difference is 2.5m. The limited depth of access channel is the biggest problem for Hai Phong Ports. However, Hai Phong Port has a long history for operation and not only accumulation of port facilities but also supporting functional facilities and infrastructures and many peoples living with port business. Therefore, it is very important to use Hai Phong ports effectively.

Hai Phon Port is managed and operated by Haiphong Port Holding Limited Liability Co. under VINALINES. VINALINES is operating not only Hai Phong Port but also other main Vietnamese ports, such as Saigon Port, Da Nang Port, Can Tho Port and Cai Lan Port through its subsidiary companies.

Throughput of Hai Phong Port during 2002 to 2009 is presented in Table 3.1.4.



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Table 3.1.4 Throughput of Hai Phong Port

	2002	2003	2004	2005	2006	2007	2008	2009 until Oct
<b>1. Export</b>	<b>1,365,476</b>	<b>1,757,845</b>	<b>1,792,445</b>	<b>2,349,120</b>	<b>2,825,099</b>	<b>2,684,001</b>	<b>3,243,855</b>	<b>1,977,551</b>
Sugar								
Apatit		1,750	2,029		45,790	75,824	261,446	60,592
General	3,947	2,035	500	1,750	504	33,177		
Container	1,193,139	1,650,877	1,650,945	1,827,447	2,193,578	2,117,574	2,190,655	1,649,867
Timber	65,886	28,800	68,388	109,131	103,836	82,533	54,800	45,567
Logistic cargo								
Chemical			287				2,922	
Metal	6,998	1,250	2,002	2,712	409	13,041	204,558	18,205
Klinker			2,100		54,311	51,662	154,439	21,146
Forest and native products								
Foodstuff	10,000							
Miscellaneous								
Equipment	11,055	2,477	5,944	10,151	10,317	14,735	18,092	21,768
Asphalt			1,399					
Fertilizer			212	5,679		27,784	110,504	31,568
Metalic ore	50,379	29,656	11,376	17,149	25,044	28,455	43,924	10,069
Food and vegetable								
Jute carpet								
Gypsum			60					
Coal				331,492	306,938	4,991	18,985	5,716
Construction Material	24,072	41,000	14,798	38,051	67,962	230,109	149,024	94,581
Cement			32,405	5,558	16,410	4,100	27,312	18,470
Oil						16	5,703	
<b>2. Import</b>	<b>5,286,584</b>	<b>5,401,816</b>	<b>5,368,625</b>	<b>5,196,931</b>	<b>5,198,668</b>	<b>6,218,248</b>	<b>7,634,025</b>	<b>7,103,342</b>
Sugar			2,199		5,893			2,000
Apatit			49	83	2,100	40	57	133
General	121,105	31,386	16,527	6,353	5,516	10,459	17,438	11,226
Cotton								
Container	1,652,471	1,974,339	1,792,646	2,035,552	2,237,235	3,285,283	3,990,268	3,007,776
Timber	36,357	46,783	72,101	21,307	41,699	13,059	13,669	38,217
Logistic cargo								
Chemical	43,192	38,267	40,078	56,655	47,060	64,945	46,404	16,982
Metal	1,974,411	1,535,265	1,607,142	1,426,176	1,220,232	1,409,737	1,791,699	1,990,958
Klinker	133,229	279,003	286,376	154,056	146,148	26,149	30,832	3,000
Forest and native products	5,382		21,635	3,738				
Foodstuff	118,852	6,546	823	3,933	160			
Miscellaneous		2,911		796				
Equipment	145,641	105,523	137,863	111,199	88,789	249,282	325,785	259,687
Salt	52,152	1,132					22,921	61,961
Asphalt	12,057							
Fertilizer	589,320	552,182	446,514	259,515	101,807	54,593	18,922	99,305
Sulfur				58,073	96,701	95,251	73,443	143,246
Metalic ore	75,373	77,695	133,623	113		49,358	60,907	32,786
Food and vegetable			50	209	219	38,241		72,135
Foodstuff for cattle	218,398	698,176	399,636	513,652	762,977	833,030	608,688	869,331
Gypsum	106,744	52,322	118,958	121,709	17,608	22,603	10,340	
Coal			42,849	26,671	23,466		13,582	23,586
Construction Material	1,900	1	27,115	6,501	550	245	39,964	1,688
Cement					400,508			
Oil		285	222,441	390,640				467,076
<b>3. Domestic</b>	<b>3,669,293</b>	<b>3,358,601</b>	<b>3,325,436</b>	<b>2,966,007</b>	<b>3,127,601</b>	<b>3,398,319</b>	<b>3,091,106</b>	<b>2,982,229</b>
Sugar	14,324	502	4,874	8,743	4,958	240		11,444
Apatit	53,354	89,637	98,620	114,231	114,293	109,283	135,624	98,368
General	268,717	65,323	60,980	55,649	39,891	55,397	57,224	67,449
Cotton	0	0	0	0	0			
Container	1,183,766	1,303,783	1,466,208	1,379,057	1,146,160	1,168,873	1,552,846	1,683,740
Timber	2,120	13,349	28,996	51,052	33,407	18,696	12,666	1,865
Logistic cargo	0	0	0	0	0			
Chemical	18,768	7,420	12,387	15,998	3,433	4,260	4,583	7,497
Metal	240,395	269,411	285,358	243,201	160,302	157,437	203,633	261,517
Klinker	41,387	34,189	48,565	140,275	460,925	509,190	182,741	289,464
Forest and native products	7,369	14,571	10,436	7,917	0		1,413	1,955
Foodstuff	571,881	199,198	249,819	60,718	50,082			
Miscellaneous	0	46	45	0	0			14,570
Salt	46,750	21,796	15,302	6,504	1,719		1,638	1,014
Equipment	8,801	13,042	13,867	16,374	19,194	47,391	18,237	12,665
Asphalt	821	1,390	130	61	0			
Fertilizer	252,149	300,599	161,187	192,722	120,171	278,589	276,357	110,994
Sulfur	0	0	61,686	2,654	0	2,114	8,132	
Metalic ore	27,034	39,362	51,348	54,236	50,960	42,380	78,161	7,871
Food and vegetable	6,146	12,393	18,116	13,490	17,614	62,784	63,126	46,673
Foodstuff for cattle	73,001	283,258	219,382	288,871	279,437	147,489	134,275	123,211
Gypsum	0	6,119	11,909	0	0		6,119	2,350
Coal	0	773	149,658	52,660	40,642	27,819	21,739	46,264
Construction Material	185,410	237,612	142,447	116,463	100,664	114,322	42,378	49,310
Cement	667,100	444,682	213,815	144,619	475,446	652,050	275,958	133,998
Oil	0	146	301	512	58	5	14,256	10,010
Sulfur					8,245			

## 3.2 Hinterland Transportation

### 3.2.1 Road

The road network in the northern Viet Nam, 116,410km of total distance consist of national highway (6,882 km), provincial road (8,950km), district road (15,350km) and others (99,964km) based on TDSI's data in 2005. The road network in the Northern Vietnam has been developed connecting the capital city, Hanoi and major cities and international ports, Hai Phong and Cai Lan as well as the small and medium cities and towns. The major national highways in the area are: NH1, NH2, NH3, NH5, NH6, NH10 and NH18.

In the future road network, the Ministry of Transport of Vietnam has planned Tan Vu-Lach Huyen Highway for connection with Lach Huyen Port. Moreover, Hanoi-Hai Phong Express Highway (105.5km of distance, 120km/hour of design speed, both direction 3 lanes) was also authorized as BOT method development project.

#### (1) National Highway 1 (NH1)

The longest and the most important route longitudinally connects Lang Song province in the north and Ca Mau province in the south with a total length of 2,300km. NH1 has a 2-lane carriageway but it is widened to 4-lanes in some sections near the large and medium cities. NH1 links major cities, major ports and airports along the coastline in Vietnam such as Hue, Da Nang, Qui Nhon, Nha Trang and HCMC and traverses 33 provinces. NH1 from Dong Dang (Lang Son) to Gia Bay Bridge (Thai Nguyen) has been improved recently, and thus the quality is good.

#### (2) National Highway 2 (NH2)

A major route in Northern Vietnam connecting capital Hanoi, Vinh Phuc province, Phu Tho province, Tuyen Quang province and Ha Giang province with a total length of 313km. The section through Vinh Phuc has been upgraded with 4 lanes under BOT scheme. NH2 is planned to be upgraded to Class III.

#### (3) National Highway 3 (NH3)

A major route links capital Hanoi with Northernmost provinces of Vietnam including Thai Nguyen province, Bac Kan province and Cao Bang province with a total length of 350km. This route starts from Duong Bridge and finishes at Ta Lung border gate. NH3 is planned to be upgraded to Class III.

#### (4) National Highway 5 (NH5)

A major transport route connecting capital Hanoi and international port, Hai Phong with a total length of 106km. NH5 has basically a 4-lane carriageway traversing rural areas except for many small cities and towns in Hung Yen province, Duong province and Hai Phong province. Several industrial parks and small and medium sized factories are located along this route. NH5 runs parallel with the railway of the Hanoi – Hai Phong line in some sections. Traffic congestion and accident has been caused due to the capacity shortage in some sections. It is planned to improve the capacity in whole section.

#### (5) National Highway 6 (NH6)

A major route connecting Northern part provinces including Hanoi province, Hoa Binh province, Son La province and Dien Bien province with a total length of 504km. NH6 is the road links Hanoi with Northwestern provinces of Vietnam. The start point is Nhue River bridge and the end point is Muong Lay town in Dien Bien province. NH6 traverses rural mountainous areas except for some small and medium sized cities in Quang Ninh province and Dien Bien province. It is planned to upgrade to Class I-II in Ha Noi – Xuan Mai and to Class III in Xuan Mai – Hoa Binh.

(6) National Highway 10 (NH10)

A major route connecting the Northern part provinces including Quang Ninh province, Hai Phong province, Thai Binh province, Nam Dinh province and Thanh Hoa province with a total length of 230km. NH10 basically a 2-lane carriageway but in some short sections passing medium sized towns, the carriageway is widened to 4-lanes. NH10 traverses rural areas except for some small and medium sized cities in Quang Ninh province, Hai Phong province and Thai Binh province. Some small and medium sized factories are located in the area. It is planned to upgrade to Class III in Ninh Binh, to upgrade to Class IV in Thanh Hoa, and to construct bypass in Nga Son town.

(7) National Highway 18 (NH18)

A major route connecting Noi Bai in Hanoi and Mong Cai, the eastern border between Quang Ninh province and China with a total length of 342km. NH18 has basically a 2-lane carriageway. NH18 traverses rural agricultural areas except for some small and medium sized cities in Bac Ninh province and Hai Duong province. Some small and medium sized factories are located in this area. The section from Bac Ninh to Cua Ong is class II-III, while the section from Cua Ong to Mong Cai is class V. The section from Cua Ong to Mong Cai is planned to be upgraded to Class III.

Above NH1, NH3, NH5, NH10 and NH18 were improved/upgraded by the Japan's ODA fund.

In addition to National Highways, the following expressways are planned in the Northern Vietnam.

- Ha Noi - Hai Phong, 105km in length
- Ha Noi - Viet Tri - Lao Cai, 264km in length
- Ha Noi - Ha Long - Mong Cai, 294km in length
- Ha Noi - Thai Nguyen - Cho Moi (Bac Kan), 90km in length
- Lang Hoa Lac - Hoa Binh, 56km in length
- Ninh Binh - Hai Phong - Quang Ninh, 160km in length



Source: Road Transport Development Master Plan 2020

Figure 3.2.1 Road Plan in the Northern Vietnam

### 3.2.2 Railway

There are five railway routes in the Northern part of Vietnam.

- (1) **Hanoi – Ho Chi Minh City Line:** The longest railway line occupying two thirds of the total Vietnam railway network which connects the capital city in the north and HCMC with the total length of 1,726km. This line is the biggest railway service provider dominating more than 80% of total passenger transport and nearly 60% of cargo transport in Vietnam. Since this line runs along the long coast line between the north to south, it competes with air transport for long distance and with bus transport for medium distance. Regarding cargo transport service, inland waterway transport and truck transport are competitors. Many cities are located along this line and there is a constant demand for railway transport on all the section along this line.
- (2) **Hanoi - Hai Phong Line:** This line links capital city Hanoi and international port city Hai Phong with the total length of 102km. The composition of passenger and cargo transport on this line is about fifty – fifty at present but passenger transport is expected to increase with the raise of travelers and commuters between Hanoi and Hai Phong. The container cargo transport by rail is also expected to increase since industrial parks along this line are developing very rapidly and container throughput of Hai Phong Port has also been growing drastically recent years. Hanoi - Hai Phong Line is planned to be improved to double track with 1435mm gauge in whole section, and be elevated in the section from Ly Thuong Kiet to Hai Phong Station. The new railway is expected to be constructed along Hanoi – Hai Phong expressway, which will be connected to Lach Huyen Port.
- (3) **Hanoi - Dong Dang Line:** This line is one of two international routes connecting Hanoi and Dong Dang in Lang Son province which is located north-east border gate to Nanning of China with the total length of 162km. This line is equipped with a dual gauge accommodating both types of trains of normal gauge and meter gauge. The northern section of the line is located in a mountainous area with many tunnels and where the agricultural productivity is not high. However this line has significant potential as a strategic land transport route between Vietnam and China.
- (4) **Hanoi - Quan Trieu Line:** This line was initially developed to transport mineral ore from the mines located 75km north of Hanoi. This line is equipped with a dual gauge and operated only single trip per day for each passenger and cargo train. Noi Bai Airport (Hanoi International Airport) is located near this line and this line has development potential to serve between the hinterland of Hanoi and the capital city.
- (5) **Hanoi - Lao Cai Line:** This line is another international route to China. This line links Hanoi and Lao Cai in Lao Cai province which is the west gate to Kunming, China with the total length of 296km. Agricultural commodities and mineral ore produced along this line are the main cargo goods.





Source: Hai Phong City Master Plan

Figure 3.2.2 Railway Plan around Hai Phong

### 3.2.3 Inland Waterway

Main waterways in the North are Red River and Thai Binh River. They are affected by hydrographic factors. The minimum width ranges from 30m to 36m while that of depth is from 1.5m to 3.6m. There is great difference in depth between the dry and rainy season (5m to 7m, even 10m). Besides there are lots of river ports but most of them are small with low capacity of loading and unloading. In spite of many limitations, waterway transport is still a favorite choice because it is not expensive and suitable to certain kinds of goods. Vietnam is now carrying out a program on up-gradation of river ports as well as river bed dredging to improve waterway ability.

### 3.2.4 Industrial Parks in the Northern Viet Nam

In 2010, total developing area of Industrial Parks (total 49 IPs) in the northern Viet Nam, is more than 17,000 ha. (Table 3.2.1).

The Dinh Vu Industrial Zone (DVIZ) in Hai Phong, having biggest developing area (1,463 ha) in Northern Viet Nam, is a development with port facilities (Dinh Vu Terminal) initiated by a consortium of international companies in close co-operation with the Vietnamese Authorities.

Figure 3.2.3 shows the main Industrial Park Locations around Red River Delta, Hai Phong Port and Cai Lan Port.

Table 3.2.1 Industrial Parks in the Northern Viet Nam

Municipality/ Province	No.	Name of IP	Area (ha)	Investor
Hanoi	1	Thang Long	302	Dong Anh Co. & Sumitomo Corp. Joint Venture
	2	Thach That - Quoc Oai	155	Vietnam Investment Development Group (VID)
	3	Soc Son	55	Ha Noi Construction Investment JSC
	4	Sai Dong B	97	Hanoi Electronics Corporation (Hanel)
	5	Sai Dong A	420	Deawoo and Ha Noi Electronics Joint Venture
	6	Quang Minh	344	Vietnam Investment Development Group (VID)
	7	Phu Nghia	670	Phu My Industrial Development JSC
	8	Noi Bai	100	Noi Bai Development Co. Ltd.
	9	Nam Thang Long	261	Infrastructure Development JSC - Ha Noi Industrial and Trade Association
	10	Khu Công nghệ cao Sinh	200	Pacific Land Ltd và Cty CP Tư vấn Đầu tư Xây dựng & Ứng dụng Công nghệ mới Vinaconex R&D
	11	Hanoi - Dai Tu	40	Vietnam Investment Development Group (VID)
	12	Dong Anh	470	Projects Management Board of Dong Anh District
	13	Bac Thuong Tin	112	D.I.A Development and Investment Co.
	14	Bac Thang Long	302	Dong Anh Co. & Sumitomo Corp. Joint Venture
Hai Phong	1	Trang Duc	600	Công ty CP Khu Công Nghiệp Sài Gòn – Hải Phòng
	2	Nomura	153	Công ty Phát triển Khu Công Nghiệp Nomura Hải Phòng
	3	Nam Cau Kien	263	Công ty CP Công nghiệp Tàu thủy Shince
	4	Đinh Vu	1,463	Công ty Liên doanh TNHH Phát triển Đinh Vũ
	5	Do Son	150	Công ty Liên doanh Khu Chế Xuất Hải Phòng
Quang Ninh	1	Viet Hung	301	507 Construction Company
	2	Hai Yen	182	Công ty Kinh doanh Bất động sản Viglacera
	3	Dong Mai	200	Công ty Kinh doanh Bất động sản Viglacera
	4	Cai Lan	278	Quang Ninh Construction & Cement JSC
Bac Ninh	1	Yen Phong II	479	Cty CP Sông Đà 10 & Cty CP Xây dựng hạ tầng Sông Đà
	2	Yen Phong I	750	Tổng Công ty Thủy tinh và Gốm Xây dựng
	3	Tien Son	410	Công ty Đầu tư Phát triển Hạ tầng INDECO
	4	Thuan Thanh III	368	Công ty CP Khai Sơn
	5	Thuan Thanh II	250	Cty TNHH Shunfar
	6	Thuan Thanh I	200	Công ty Đầu tư Phát triển Nhà & Đô thị (HUD)
	7	Que Vo III	593	Cty CP Nông sản Bắc Ninh
	8	Que Vo II	570	Công ty CP Đầu tư Phát triển Đô thị và Khu Công
	9	Que Vo I	640	Công ty CP Phát triển Đô thị Kinh Bắc
	10	Nam Son - Hap Linh	800	Viglacera Company
	11	Hanaka	74	Cty CP Tập đoàn Hanaka
	12	Do Thi Dai Kim	508	Tập đoàn Hồng Hải Foxconn (Đài Loan)
	13	Dai Dong - Hoan Son	600	Công ty CP Phát triển Đô thị Kinh Bắc
Hai Duong	1	Phuc Dien	170	Công ty xây dựng Số 2 (Thuộc Tổng Công ty xây dựng Hà Nội)
	2	Nam Sach	63	PhuThai Land Corporation
	3	Lai Cach	191	Dai An JSC
	4	Dai An	645	Dai An JSC
Hung Yen	1	Thang Long 2	219	Sumitomo Japan Corporation & Thang Long IP Co.
	2	Pho Noi A	390	Công ty Cổ phần xây dựng & phát triển đô thị Hòa Phát
	3	Minh Duc	200	VNT Co. Ltd
	4	Đet may Pho Noi B	135	Pho Noi B Textile Development JSC
Vinh Phuc	1	Kim Hoa	264	Công ty TNHH Một Thành viên Phát triển đô thị & Khu công nghiệp IDICO
	2	Khai Quang	262	Công ty Cổ phần phát triển hạ tầng Vĩnh Phúc
	3	Chan Hung	131	Công ty Kinh doanh Bất động sản Viglacera
	4	Binh Xuyen	982	Công ty TNHH Đầu tư xây dựng An Thịnh
	5	Ba Thien	327	Công ty TNHH và Quản lý hạ tầng Compal
Total			17,338	

Source: Website of "VIPIP: Vietnam Industrial Zones" (January 2010)





**Figure 3.2.3 Industrial Park Locations around Red River Delta**

## **4. Past Port Development Plans in Northern Viet Nam**

### **4.1 Urgent Rehabilitation Plan of Hai Phong Port Master Plan Study**

This study was conducted by JICA in 1993 for the transport development in the Northern ports of Vietnam. In this study, the total cargo volume was forecasted to grow from 2.4 million tons of 1992 to 5.7 million tons in 2000 and container traffic will be 200,000 TEU by 2000. Based on the demand forecast result, it was proposed that the existing access channel of Hai Phong port should be deepened to -6.0m and the berth No. 1 to No.3 of Hai Phong main port and Chua Ve port should be improved for container handling. This study also had highlighted the severe problems on deepening and maintaining of the Nam Trieu outer channel.

### **4.2 Hai Phong Port Rehabilitation Project Phase I**

This study was conducted in 1995 and 1996 by JICA to review the above Urgent Rehabilitation Plan of Hai Phong Port Master Plan and define the urgent improvement project for the port facilities up to the year 2000. At that time, it was expected that container traffic will increase rapidly and the site at Chua Ve port had sufficient land areas and room for additional berths to meet the projected traffic demand. Therefore, this report recommended implementing following projects urgently:

- Chua Ve port should be restructured to be a new dedicated container terminal. So that, in addition to the 2 existing berths, one berth and the stacking yard should be expanded and 2 quay gantry cranes and 4 RTG should be installed.
- During above new container facilities are under construction, the berth No.1 to No.3 of Hai Phong Main Port should be used for container handling temporarily to meet the excess container traffic.

Above plans were established within the framework of the Master Plan of development for projected traffic demand up to 2010. However, the improvement of access channel was not included in this project since it was under detailed investigation by the other consultant, Haecon, at that time as will be mentioned below.

### **4.3 General Study of Access Channel to Hai Phong Port**

This study was conducted by the Belgian harbor and engineering consultant, Haecon in 1995 and 1996. This study carried out a comprehensive program of field data collection and analysis for the improvement of access channel of Hai Phong Port. The scope of this study consisted of site survey and monitoring, hydraulic and sedimentation analysis, comparative study on alternative alignments of access channel and detailed design of access channel. In this study, the new channel alignment in Lach Huyen through the Trap Canal was proposed as the most recommendable option for Hai Phong Port and approved and agreed to implement it by the following two stages by the Vietnamese Authorities concerned:

- Stage 1: The portion of Lach Huyen access channel is dredged to -7.7m CDL and other portion is to -7.5m CDL, for which required dredging volume was estimated at 13.8 million m<sup>3</sup>. By this dredging, fully laden 10,000DWT vessels with under keel clearance of 1.2m can be navigable at 15% of total time (waiting times is within 10days excepting navigation restriction at storm condition).
- Stage 2: The portion of Lach Huyen access channel is deepened to -9.0m CDL and other portion is to -8.15m to -8.35m, for which required dredging volume was estimated at 18.9 million m<sup>3</sup>. By this improvement, fully laden 10,000DWT vessels can be navigable at 65% of total time (waiting time is less than 20 hours) with under keel clearance of 1.05m in calm river and 1.7m in Lach Huyen Channel.



The decision between the two stages will be made subsequently by economic comparison among waiting times, number of ship calls, capital investment and traffic increase. However, this analysis was out of scope of this study and any prediction was made on financial viability of channel improvement related to varying ship sizes and waiting time.

#### **4.4 Cai Lan port Expansion Project**

This study was conducted by JICA in 1998 aiming to define following matters:

- Traffic demand forecast in Northern Vietnam for short term (2005) and long term (2010) development.
- Allocation of forecast traffic demands of short term and long term development to Cai Lan Port and Hai Phong Port.
- To identify the required facilities for the Stage 1 development suitable for the traffic demand of 2005.
- To establish the outline development plan for target year of 2010.

In this study, the total cargo volume of Northern Vietnam was forecasted at 18.3 million tons in 2010 and it was distributed 6.8 million tons to Hai Phong Port and 11.4 million tons to Cai Lan Port. This study recommended to construct additional three (3) berths, one (1) container berth and Two (2) bulk/general cargo berths and to dredge the access channel up to -10m as the Stage 1 development. This study also presented the provable expansion of 9 new berths and channel depth of -11m as the Stage 2 development.

#### **4.5 Access Channel to the Ports in Hai Phong Area**

This study was conducted by MOT/TEDI in 1997 under the following scope of works:

- To forecast cargo demand of the ports in Hai Phong area for the target years of 2000 and 2010.
- To propose the access channel alignment and configuration suitable for navigation of 10,000DWT and larger ships.
- To analyze and assess the economic feasibility of the proposal.

The recommendations made by the study were:

- To make a new route for the outer part of access channel passing through the Trap Canal and Lach Huyen waterway instead of the existing route through Nam Trieu Channel.
- The new channel should have the bottom width of 80m in inner part and 100m in outer part.
- The depth of new channel should be -8.0m to -7.95m which provide under keel clearance of 1.05m at inner channel and 1.7m at outer channel.
- Navigation water level is +2.5m CDL.
- Access availability is 65%.

It was recommended to implement above channel improvement work in two phases. The first phase should be carried out as an urgent project by 2010, of which dredging volume would be 13.9 million m<sup>3</sup> and the second phase will be implemented in future in accordance with the further development of berths in the area.

#### **4.6 Feasibility Study of Hai Phong Rehabilitation Project Phase II**

This study was conducted by MOT/TEDI in 1998 aiming to confirm the feasibility of Phase II rehabilitation project of Hai Phong Port.

The main issues studied were:

- To forecast cargo demand and shipping fleet
- To determine necessary port improvement/rehabilitation for Phase II project.
- To determine the required access channel improvement for Phase II project.
- To estimate the project costs.
- To analyze economical and financial feasibility of the project.

The study concluded:

- To cope with the increasing container demand, the expansion of container terminal up to 420,000TEU should be concentrated at Chua Ve Port where 2 additional berths would be required.
- The route of outer part of access channel should be shifted from the existing Nam Trieu channel to Lach Huyen channel through Trap Canal.
- For develop above new channel with the depth -7m, 17 million m<sup>3</sup> of dredging would be required.
- Because of the difficulty to maintain and prepare the cost for making channel more deepen, the channel depth of -7.0m and ship size limit for fully laden 10,000DWT vessel would apply for the foreseeable future to 2010 and beyond.
- By this channel improvement, ship waiting time would be reduced. However, the reduction was not quantified in this study.

#### **4.7 Master Plan of Northern Seaport Group 1 till year 2010 and orientation to 2020**

This master plan of Northern Seaport Group 1 is a part of the master plan for Vietnam Seaport System Development till 2010 orientation to 2020 was prepared by Vietnam maritime Administration (VINAMARINE) and approved by the Prime Minister under decision No. 2020/1999/QG-TTg dated 12 October 1999.

The planned area consists of Quang Ninh, Thai Binh, Nam Dinh, Ninh Binh and Hai Phong provinces.

The total cargo volume in the North was forecasted at 89 to 123 million tons/year in 2020.

Target vessel sizes were planned for each port as follows:

- Cai Lan Port: 40,000 to 50,000DWT
- Petrol B12 Port: 40,000DWT
- Cam Pha Coal Port: 65,000DWT
- Hai Phong Port: 10,000 to 20,000DWT

It was planned that in Cai Lan Port, three (3) berths, No.2, No.3 and No.4 would be constructed and in Dinh Vu Port, six (6) berths would be constructed.

#### **4.8 Construction Investment Project of Hai Phong - Lach Huyen Gateway Port**

This study was conducted by TEDI in 2007 under the finance of VINAMARINE.

##### **1) Objective of the Project**

The objective is to prepare the construction investment plan for the development of Hai Phong – Lach Huyen Gateway Port in order to meet the demand forecast during years 2010 and 2020, contributing to stimulate socio-economic development of Northern area.

## 2) Study Scope

- To prepare the master plan of new gateway port for Northern area and the transport network link to the port till year 2020 orientation to 2030.
- To implement the feasibility study on construction investment for Lach Huyen general cargo port in the Initial Stage and Medium Term development for target year 2015 and 2020, respectively.

## 3) Potential Plan of Lach Huyen Gateway Port

Lach Huyen gateway port will consist of the following zones:

Port	General Cargo Port	Liquid Cargo Port	Industrial Zone Port	Shipbuilding Zone
Area (ha)	825	80	430	540
Berth Length (m)	13,200	1,600	8,000	3,800
Max. Ship (DWT)	80,000	50,000	10,000 – 30,000	100,000
Throughput (Mill. T/Year)	200 - 300	20	30	-

## 4) Forecast Throughput of Northern Ports

(Unit: 1,000t)

Port	2004	2015		2020	
	Actual	Case 1	Case 2	Case 1	Case 2
<b>Total North Port Group</b>	<b>32.6</b>	<b>77</b>	<b>80</b>	<b>110</b>	<b>130</b>
<b>I. Hai Phong Port Area</b>	<b>14.8</b>	<b>38.7</b>	<b>38.7</b>	<b>38.7</b>	<b>38.7</b>
- General cargo	13	28	28	28	28
- Cement & Clinker	1	6.7	6.7	6.7	6.7
- Oil	0.8	4	4	4	4
<b>II. Quang Ninh Area</b>	<b>17.8</b>	<b>32.3</b>	<b>33.3</b>	<b>36.3</b>	<b>40.3</b>
- General cargo	2.5	11	12	18	20
- Cement	1.4	7.3	7.3	7.3	8.3
- Oil	3.7	3	3	0	0
- Coal	10.2	11	11	11	12
<b>III. Lach Huyen Port Area</b>	<b>0</b>	<b>6</b>	<b>8</b>	<b>35</b>	<b>51</b>
- General Cargo	0	4	6	26	40
- Oil	0	2	2	9	11

## 5) Forecast Throughput of Lach Huyen Gateway Port

(Unit: 1,000t)

Year	2015	2020		
Cargo Type		Alternative 1	Alternative 2	Alternative 3
<b>A. General Cargo</b>	<b>6,000</b>	<b>26,000</b>	<b>26,000</b>	<b>40,000</b>
- Container (1,000TEU)	5,500 (460)	18,000 (1,498)	14,000 (1,148)	24,000 (1,951)
- Bulk Cargo	-	3,700	3,700	6,000
- Packed General cargo	500	4,300	8,300	10,000
<b>B. Liquid Cargo</b>	<b>2,000</b>	<b>9,000</b>	<b>9,000</b>	<b>11,000</b>
<b>Total</b>	<b>8,000</b>	<b>35,000</b>	<b>35,000</b>	<b>51,000</b>

**6) Scale of Lach Huyen Port**

Year	2015	2020		
Port	Container Terminal	Container Terminal*	Genera Cargo Terminal	Bulk Cargo Terminal
Number of Berth	2	4	5	2
Area	36 ha	72 ha	58 ha	28 ha
Length of Berth	600m	1,200m	1,000m	500m
Average Width	600m	600m	540m	560m
Depth of Berth	-14m	-14m	-12m	-13m

Note: \* Scale of 2020 includes the facilities developed in 2015.

**7) Scale of Access Channel**

Item	Unit	2015	2020
1 Length	m	15,700	16,500
2 Width	m	130	150
3 Depth of Navigable Channel	m	13.3	14.9
4 Dredging Level	m	-10.3	-11.9
5 Channel Dredging Volume	m <sup>3</sup>	8,221,225	13,142,929
6 Basin Dredging Volume	m <sup>3</sup>	720,209	10,339,991
7 Total Dredging volume	m <sup>3</sup>	8,941,434	23,482,920

**8) Scale of Port Protection Facilities**

Item	Unit	2015	2020
1 Breakwater			
- Length	m	3,900	3,900
- Top Elevation	m	+5.0	+9.0
2 Sand Protection Dyke			
- Length	m	5,700	10,700
- Top Elevation	m	+2.0	+2.0

**9) Transportation Network link**

- Initial Period: Traffic volume is estimated at 8 million tons/year. A new road from the port to Hai Phong City with 3 lanes and 12 km in length and another new road to Quang Ninh Province with 2 lanes and 23 km in length will be constructed.
- Year 2020: Traffic volume is estimated at 35 million tons/year. The road from port to Hai Phong city will be upgraded to 6 lanes.
- Year 2030: Traffic volume is estimated at 120 million tons/year. The railway toward Hai Phong will be constructed.

**10) Project Cost**

Project cost of Initial Stage was estimated at 7,018,819 million VND and the development cost for Second Stage of 2020 was estimated at 16,151,122 million VND.



### **11) Financial Viability**

The results of financial analysis are as follows:

- IRR: 12.1%
- B/C: 1.13
- NPV: 2,856,668 million VND