3 EXSITING PORTS AND SHIPPING SERVICES

3.1 Overall Metropolitan Ports System

1) Port Classification and Port Jurisdiction

a. Port Classification

In the study area of Surabaya, Gresik, Lamongan, Bangkalan, there are one Hub International Port (Tanjung Perak), two National Ports (Gresik, Kamal), one Regional Ports (Telagabiru) and one Local Port (Sepulu) (see Table 3.1.1 and Figure 3.1.1). There are also one Special Port at Gresil (Semen Gresil) and two Ferry Terminals (Kamal and Gresik). Port of Brondong is located at the north shore of Lamongan and faces to the Jawa Sea, so it can be excluded from the list of study ports

Port of Tanjung Perak and Port of Gresik are managed by PELINDO III and others are managed directly by the central government.

Table 3.1.1 Port Classification in the Study Area

Class		Type of Port	Name of Port
Main Port	I	International Hub Port	Tanjung Perak
	II	International Port	
	III	National Port	Gresik, Kamal
Feeder Port	I	Regional Port	Telaga, Biru
	II	Local Port	Sepulu

Note: based on the Government Decree Number KM.53 of 2002

Figure 3.1.1 Existing Ports Location in the Study Area

Source: JICA Study Team

b. Port Jurisdiction

Surabaya Port Area was designated for ship navigation and safety based on No.KM22 of 1990. and is managed by the Ministry of Transport. This area consists of land and water areas which are designated as government and economic activity areas used for ship transportation, passenger movement, cargo handling and other relevant activities. It is classified into the Port Working Area (DLKR) and Port Interest Surrounding Area (DLKP) – although technically, DLKP includes the DLKR (see Figure 3.1.2). DLKR is the waters and land area in the public port used directly for port activity, and DLKP is the waters area surrounding waters working area used for facilitating ship safety and possible future development areas thereby the DLKP is inclusive of DLKR.

Figure 3.1.2 Port Area

Source: Ministry of Transport

DLKR of Tanjung Perak Port is designated pursuant to the Joint Ministerial Decree of Communication and the Minister of Home Affairs No. 91 of 1981 and No. KM. 110/AL. 106/Phb-81 dated April 21, 1981. Meanwhile, DLKR of Gresik Port is designated pursuant to the Joint Decree, the Minister of Communication and the Minister of Home Affairs No. 169 of 1996 and No. KM. 63 of 1996 dated October 2, 1996. The area sizes of the two DLKR is summarized in Table 3.1.2. The DLKP exclusive of the two DLKR is 35,125 ha (i.e. north of DLKR of Gresik).

Table 3.1.2 Area Size of DLKR

	Tanjung Priok	Gresik
Land Area (ha)	517.64	96.4
Water Area (ha)	4,675.59	8,149.5

Source: PELINDO III

The port working area (DLKR) of Tanjung Perak consists of land and water areas of 517.64 ha and 4675.59 ha, respectively. Breakdown of land area usage is specified as shown Table 3.1.3. The water area is managed by PELINDO III and the land is owned by the central government,

but land management is entrusted to PELINDO III. Presently, some parts of the lands are leased to industrial companies, maritime business companies and individuals by PELINDO III.

Table 3.1.3 Land Use of Port of Tanjung Perak

Land Use	Area (m^2)	Share (%)
Terminal	2,227,395	43.0
Port Related Industry	553,606	10.7
Maritime Business Complex	645,782	12.5
Business Center	146,124	2.8
Cargo Distribution District	487,253	9.4
Truck Terminal	64,650	1.2
Sub Total	4,124,810	79.7
Others	1,051,590	20.3
Total	5,176,400	100.0

Source: PELINDO III

2) Port Management, Maritime Safety and Security

a. Port Related Government Agency

Port is a gateway for international and domestic trade and a junction for various transportation modes through maritime transportation. Therefore port activities are related to various administrative organizations and business sectors. Therefore port activities are supervised and controlled from various points of view, such as maritime transportation, passport control, international trade, safety & security and health & environment by relevant government agencies. (see Table 3.1.4)

Table 3.1.4 Port Related Government Agency

Supervising Field	Relevant Organization					
	Port Administrator	Customs Office	Immigration Office	Port Doctor	Quarantine Office	Port Police
Maritime Transportation	○					
Passport Control			○			
International Trading		○			○ (Animal/ Plant/ Food)	
Safety & Security	○	○ (Smuggling)	○			○
Health & Environment	○ (Oil Spill Accident)			○	○	

Source: Based on the hearing by the Study Team

In the Study Area, there are two ADPEL offices at Tanjung Perak and Gresik. There are 6 classes of port administrator and Tanjung Perak is designated as 'Class Main' together with three other offices, Tanjung Priok, Belawan and Makassar, while Gresik is designated as 'Class II'. The ADPEL office has four divisions and except for administration division are respectively under three directorates of DGST, Ministry of Transport..

As for maritime transportation, Port Administrator (ADPEL) Office of Tanjung Perak has the responsibility of making sure of smooth and safe ship navigation and cargo handling in cooperation with other relevant agencies. The Tanjung Perak ADPEL has the following organization:

Table3.1.5 Number of Personnel of ADPEL Tanjung Perak

	Administration Div.	Sea Transport & Traffic Div.	Marine Safety Div.	Coast Guard Div.	Total
Number of Personnel	51	38	55	229	373

Source: ADPEL, as of Aug. 2007

The Sea Transport & Traffic Division is in charge of supervision of maritime transportation by giving permission for port arrival and departure. In addition to that, it oversees the TKBM (Tenaga Kerjasama Bongkar Muat; Cargo Handling Workers Cooperation) in order to secure both efficient port activity and stable port worker's employment condition.. Its main tasks are as follows:

- Supervising sea transportation, traffic activities and relevant port activities
- Tariff implementation monitoring
- Monitoring harbor workers' employment condition through TKBM's activity and supervising sea employment agreement
- Supervising port facility safety, development and modification of port facilities, port operation and shipping lines.

The Coast Guard Division is in charge of harbor-mastering and security patrol, as well as, overseeing the handling of dangerous cargo and pollution prevention. Its main tasks are as follows:

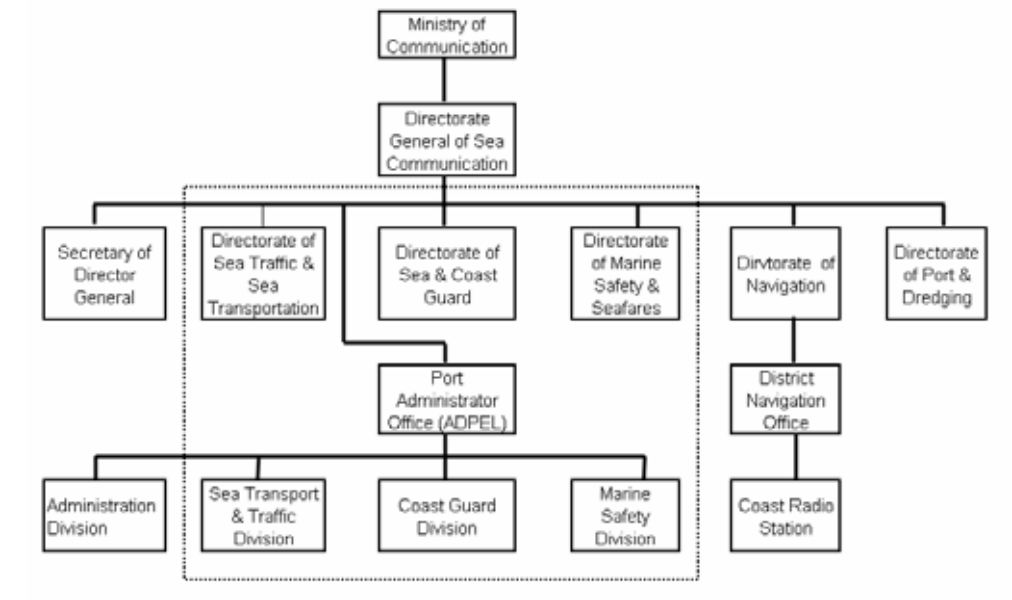
- Executing orders and rules related to security and safety in the field of shipping and sea, port crime

The Tanjung Perak ADPEL Cost Guard Divisions has about 229 officials and four patrol boats (300 HP), two patrol cars and two X-ray inspection units (which were donated by JICA and are installed at the passenger terminal, but are not working now for the reason of lack of maintenance and spare parts).

Finally, the Marine Safety Division is in charge of supervising shipping requirement, shipping certificate and shipping security management verification. Its main tasks are as follows.

- Supervising shipping requirement and shipping license
- Checking ship development and modification, shipping security management verification and international certificate
- Executing measurement of ships in order to give them legal status, national certificate
- Setting up hypothec of ship including seamen document

Figure 3.1.3 Relationship between DGST and ADPEL



Source: DGST & ADPEL

Additionally, the District Navigation Office is another frontline division but is directly under Directorate of Navigation、MOT. The office has the responsibility to promote marine security in accordance with Decree of KM Transportation No. 64, 2002. It operates and maintains sea navigational supporting facilities and maritime telecommunication, including 20 lighthouses, 38 buoys and a coastal radio station.

b. Port Management Body

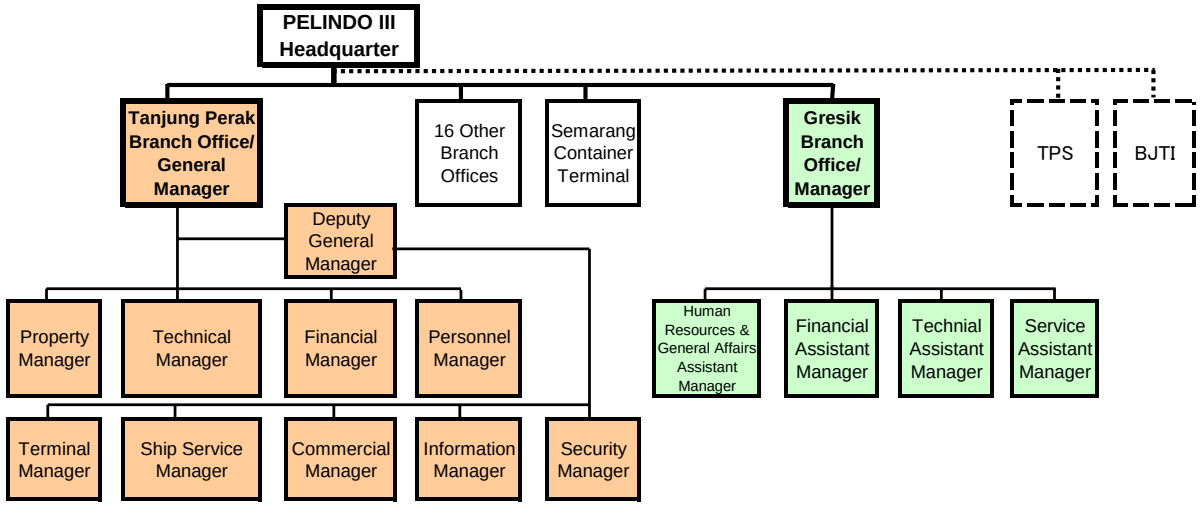
PELINDO III was at first established as a State Enterprise in 1960, but after changes to its institutional nature, it was established as a state owned port corporation supervised by the Ministry of Communication and Ministry of State-Owned Enterprise in 1992. Its ownership is still 100% Indonesian Government. Its business covers a wide-range of port activities through providing water basin, wharfs, handling equipment and equipment for passengers, warehouses and stacking yards.

PELINDO III has 18 branch offices and 1 container terminal of Semarang. It also has 5 subsidiary companies including TPS and BJTI. Port of Tanjung Perak and Port of Gresik are each managed by a branch office of PELINDO III.

The Tanjung Perak Branch Office has eight divisions with 485 official workers and 198 outsourced staffs. However, TPS is managed completely by PT. TPS, which is one of PELINDO III's subsidiary companies. Similarly, Berlian Terminal is managed by BJTI, which is also its subsidiary, but its berth allocation is controlled by Tanjung Perak Branch Office. (see Figure 3.1.4- 3.1.6, Table 3.1.6)

Meanwhile, Gresik Port is operated by its respective branch office, including cargo handling, but the coal handling is done by a private company. Gresik Branch Office has four divisions with 44 official workers and 8 staffs.

Figure 3.1.4 Organization Structure of Port Management Body



Note: Tanjung Perak Branch Office Official Workers 485, Staff 326
Gresik Branch Office Official Workers 44, Staff 8
····· means subsidiaries of PELINDO III, 51% shareholders of TPS and 95% ones of BJTI.
Source: PELINDO III

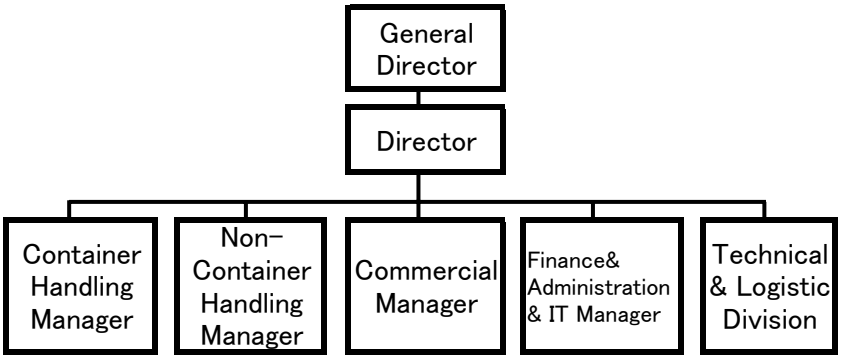
Table 3.1.6 Number of Personnel of Tanjung Perak Branch Office

Name of Division	Regular Staff	Outsourcing Staff	name of Division	Regular Staff	Outsourcing Staff
Property Division	77	30	Ship Service Division	92	15
Technical Division	40	17	Commercial Division	36	7
Financial Division	48	6	Information Division	6	4
Personnel Division	47	13	Security Division	8	198
Terminal Division	131	36	Total	485	326

Source: PELINDO III
Note: Outsourcing staffs of Security Division is included the staffs sent to BJTI and TPS.

The organization structure of PT. BJTI is illustrated in Figure 3.1.5., showing that BJTI consists of five divisions such as Finance/Administration/IT, Container Service, Non-Container Service, Commercial and Technical/Logistics Divisions. It has 194 regular staffs and 1117 on-site out-sourcing staffs. Most of outsourcing staffs are stevedoring workers of TKBM. That is because non-container service needs a lot of handling workers. And some of security staffs come from KPLP. (see Table 3.1.7 & 3.1.8)

Figure 3.1.5 Organization Structure of PT. BJTI



Source: BJTI

Table 3.1.7 BJTI's Regular Member

Name of Division	Number of Employee
Finance & Administration & IT Division	24
Commercial Division	19
Container Handling Division	82
Non-Container Handling Division	35
Technical & Logistic Division	34
Total	194

Note: General director & Director are included in the administration division.
Source: BJTI

Table 3.1.8 BJTI's Outsourcing Staff

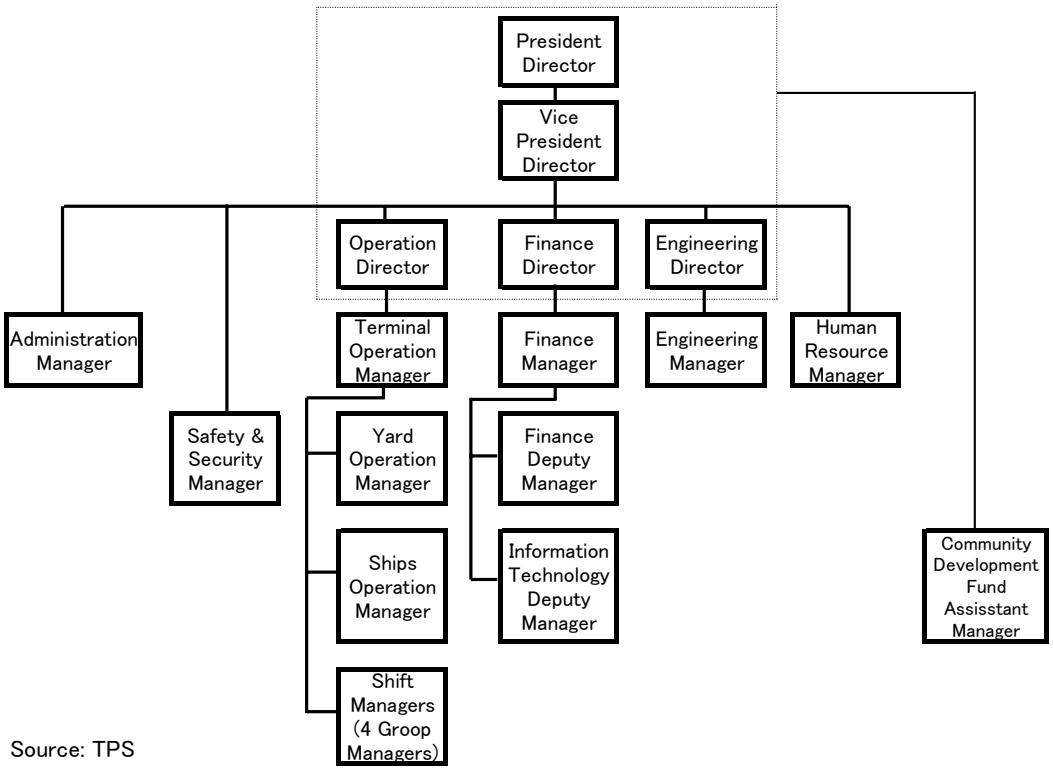
Job	Number of Persons	Provider
Tally	75	Private Company
Stevedor	948	TKBM
Security	54	KPLP & Private Company
Cleaning	40	Private Company
Total	1117	

Source: BJTI

Figure 3.1.6 depicts the organization structure of PT. TPS, wherein TPS consists of 6 divisions, including Administration, Finance, Operation, Engineering, Human Resources and Safety/Security Divisions. Total regular staffs are 600 persons and 70% of the staffs are assigned to the operation division. Most of them are shift workers including some managers, operation planners, superintendents, drivers of quay-gantry cranes, RTGs and forklifts and document services staffs. Total outsourced staffs are 1110 persons, with most of them are shift workers, including tally clerks, stevedores and CFS staffs, chassis-truck drivers, equipment maintenance staffs, cleaners and security guards. Shifting is done at intervals of 8 hours by 4 groups, working 6 days and with 2 days off. Stevedores carry out all the work on board vessels and in the CFS, there are 6 workers per gantry crane. (see Table 3.1.9 & 3.1.10)

It is notable that TPS contributes to the community through TPS community development fund. It is said to have provided for road renovation and school construction and so on.

Figure 3.1.6 Organization Structure of PT. TPS



Source: TPS

Table 3.1.9 PT. TPS's Regular Staffs

Name of Division	Number of Employee
Finance Division	64
Operation Division	418
Engineering Division	73
Safety & Security Division	17
Others (Administration &	28
Total	600

Source: TPS

Table 3.1.10 PT. TPS's Outsourcing Staffs

Job Name	Number	Note
Tally Employees	212	Shift workers
Stevedors & CFS Staff	244	
Truck Drivers	216	
Q.C. Maintenance	93	mainly shift workers
RTG Maintenance	42	
Head Truck & Chassis Maintenance	92	
Cleaners	111	
Security Guard	100	Shift workers
Total	1110	

Source: TPS

c. Port Management Relationship between PELINDO III and Others

As for port management, Tanjung Perak Branch Office of PELINDO III has the primary responsibility among relevant agencies. ADPEL has jurisdiction of port activities, and most of its roles are to supervise, control and coordinate various port activities. Therefore every ship must submit the request of ship's call to ADPEL at first before any other procedures. It also have the responsibility to manage the access channel through maintaining the channel by dredging periodically and removing sunken ships. However most of the maintenance dredging has actually been done by PELINDO III. The Navigation Office was under ADPEL of Tanjung Perak until 2002 and is now directly supervised by Navigation Directorate of Ministry of Transportation and it operates and maintains buoys for the channel and lighthouses.

PELINDO III Branch Office is the implementing body of port activities in cooperation with other relevant institutions and companies. It constructs and manages infrastructures such as wharf, buoy, basin, warehouse and open shed. It also provides navigation aid services such as pilot and tug services for ships. Moreover, lands inside the port working area, though are owned by the central government, are entrusted to PELINDO III. Some of the land is leased to maritime business companies and others. The income from those service charges and lease charge is used for the maintenance of infrastructure and equipments. PELINDO III has the prerogative to make a port development plan in cooperation with the local government. (see Table 3.1.11)

Morover, its main work is to provide navigation service and berthing and mooring allocations. Pilot and tug service charge are also collected by the Branch Office, even if ships enter in Port of Gresik. Howver, the office doesn't provide cargo handling service, which is done by stevedoring companies, while the Office provides quays and handling equipment for users.

Table 3.1.11 Port Management Relationship between PELINDO III and Others at Tg. Perak

Port Management Procedure	ADPEL	PELINDO III	TPS	BJTI
Permission of Port's Call	◎	○	TPS also gets its copy through agents.	BJTI also gets its copy through agents.
Providing Navigation Service	–	◎	–	–
Allocation of Berthing/Mooring	Every ship using Kalimas Terminal must get permission of its using from ADPEL and PELINDO III one day before its arrival. But there is no berth allocation and ship owner can berth anywhere if it is possible.	◎	◎ (TPS make berthing allocation on its own plan.)	Berthing/Mooring allocation is done by PELINDO III.
Providing of Cargo Handling/Yard Operation Service	ADPEL supoervises TKBM.	PELINDO III doesn't make cargo handling service. Stevedors provide the workers through TKBM.	◎ (TPS uses stevedors and also asked TKBM to provide workers directly.)	◎ (BJTI asked stevedors and also asked TKBM to provide workers directly.)
Permission of Handling Dangerous Cargo	◎	◎ (PELINDO III designate the place to handle for ships.)		
Water Supply Service	–	◎ (PELINDO III supply waters to not only ships ,but also other institution and company which work in port area.)	○ (PELINDO III supply water to TPS and TPS supply water to ships).)	PELINDO III supply water to BJTI's shipping users.
Safety & Security Control	◎ (ADPEL has primary responsibility on safety and security, especially in water area.)	◎ (PELINDO III has the responsibility on safety and security in the DKLR, especially terminal area except for TPS.)	◎ (TPS has responsibility onsafety and security in TPS's terminal.)	○ (BJTI control its terminal based on the direction of PELINDO III.)

Source: Based on the hearing by the Study Team

TPS and BJTI is delegated some parts of roles of the Branch Office related to their leasing of terminal. TPS's and BJTI's users must rely on navigation assistance of the Branch Office from the entrance of the channel to berthing. After berthing, every operation is done by TPS and BJTI themselves, for instance TPS and BJTI do the stevedoring work by themselves. TPS can assign berths to ship users, but the berth assignment of Berlian Terminal is still managed by the Branch Office. And Water supply service in the port area is done by the Branch Office. (see Table 3.1.12)

Table 3.1.12 Terminal Management of Tanjung Perak

Items	Name of Terminal	Tanjung Perak		
		Conventional Terminal	BJTI	TPS
Making Port Development Plans		CG/P3		
Making Terminal Development Plan		P3	P3/BJTI	TPS
Ownership	Access Channel	CG		
	Water Basin	CG		
	Land	CG		
		CG entrusted P3 to use the land.	P3 leased the land to BJTI.	P3 leased the land to TPS
	Terminal Infrastructure	P3		
	Handling Equipment	P3 & PS (Most of equipment are provided by PS)	P3 & BJTI & PS	TPS
Construction or Procurement/ Management	Channel	CG & P3		
	Navigation Aid Equipment	CG		
	Anchorage Area	P3		
	Basin	Water area is managed and operated by P3		
	Berthing Facility	P3	Improvement & maintenance of the quay is done by P3	Construction of new quay would be done by P3, but the maintenance work by TPS.
	Yard Area & related Building		Large scale improvement would be done by P3, but small scale one by BJTI.	Yard and CFS should be improved by TPS
	Access Bridge	(Not applicable)		Bridge improvement and maintenance works by TPS.
	Quay-side (Gantry) Crane	P3	Procurement of new cranes would be done by BJTI. Management is done by BJTI.	TPS
	Other Cargo Handling Equipment	P3 & PS (Most of equipment are provided by PS)	BJTI	TPS
	Terminal Security (Water)	CG (ADPEL)		
	(Land)	P3	BJTI	TPS
Operational Service	Pilot Service	P3		
	Tug Service	P3		
	Cargo Handling Service	PS	BJTI	TPS
	Laber Supply Service	TKBM		TPS except onboard stevedoring service by TKBM
	Water Supply Service	P3	P3	P3/TPS
Type of Port Management		Public Service Port	Landlord Port (Public Partly Initiative Operation)	Landlord Port (Private Initiative Operation)

Note: CG - Central Government, P3 - PELINDO III, PS - Private Sector or JV Company

Source: Compiled information of PELINDO III, ADPEL, TPS, NAVIGASI

d. Channel Management and Operation

Channel management and operation is one the most important jobs for port activities in Surabaya. Most of ships except for the traffic to and from Madura Island must pass through the West Channel in order to enter in and depart from various public and private terminals and those ships must follow the navigation rules at Surabaya.

District Navigation Class I Surabaya operates 20 lighthouses and 38 buoys and provides the necessary information to ships by radio in order to secure safety of navigation. Meanwhile, channel maintenance is primarily responsible to DGST but, as a matter of fact, it is done by PELINDO III, Tanjung Perak Branch Office. The cost incurred is settled later by following the respective procedure between the central government and a state-owned enterprise. The Branch Office also provides pilot service and tug service for not only ship users of Tanjung Perak Port, but also those of Gresik Port. TPS users just send their information of ship-calls to the Branch Office, then, the Office will provide a pilot boat and tug boats based on their request. However users, who use BJTI terminal, other conventional terminal and private facilities at Tanjung Perak Port and Gresik Port must send their information of ship-calls and the Office will decide the ship service operation plan in coordination with users every previous day before the scheduled ship arrival.

ADPEL supervises the marine traffic with patrol boats and if a ship accident happens in the channel, ADPEL must clear the ships out from the channel in order to restore channel navigation as soon as possible.

Table 3.1.13 Responsible Body of Channel management & Operation

Responsible Body	Services
Tg. Perak Office, PELINDO III	Periodical dredging for channel maintenance (on behalf of DGST)
	Navigational aids (pilotage, tug)
ADPEL of Tg. Perak	Supervision of channel traffic (patrol)
District Navigation Office	Visible aids to navigation (lighthouse, buoy)
	Navigation information (radio, VTS)

Source: Based on the hearing by the Study Team

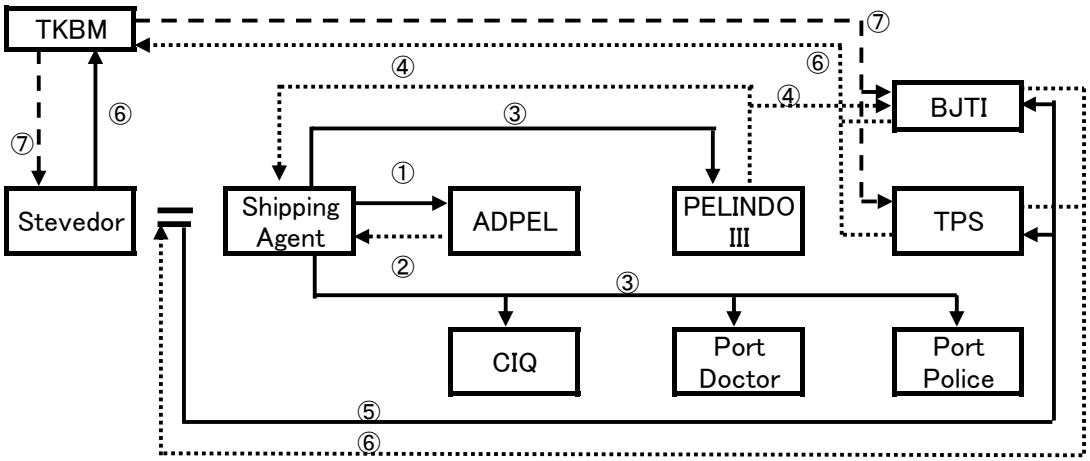
e. Ship and Cargo Service Procedure

Ship and cargo service procedure at Tanjung Perak Port is as follows;

- Shipping agents must submit the information of their ship's call with necessary documents 48hours before their arriving.
- ADPEL of Tanjung Perak accepts or denies permission for ship call.
- Shipping agents submit the request of operational services to the Branch Office of PELINDO III with the copy of ship's call permission by ADPEL and the information on the loading/unloading plan 24 hours before ship's arrival.
- Shipping agents also submit the copy of the permission to Customs Office, Immigration Office, Quarantine Office, Animal/Plant Quarantine Office and Port Police.
- The copy of the permission is also sent to the terminal operator like TPS and BJTI.
- The Branch Office of PELINDO III decides on the operation plan including pilot service, tug service, berth allotment and water supply service. BJTI also decides the operation plan, based on the decision of the Branch Office. TPS also then decides the plan of the berth allotment, the stevedoring work and the yard operation.

- Stevedoring companies request TKBM to provide workers. TPS and BJTI also request TKBM to provide workers directly, if they supervise the cargo handling by themselves.
- Shipping agents naturally negotiate with terminal operators and stevedoring companies within a certain time before starting the process.

Figure 3.1.7 Ship and Cargo Service Procedure



① Information of Ship's Call (48 hours before arrival)
② Permission of Ship's Call
③ Request of Operational Service attached Ship's Call Permission and Information of Loading/Unloading Plan (24 hours before arrival)
④ Decision of Operation Plan
⑤ Informatio of Loading /Unloading Plan
⑥ Request of providing workers and/or equipments
⑦ Provide workers

Source: Based on the hearing by the Study Team

Necessary documents for processing ship call are as follows;

- Name of ship, GRT, Length and Draft
- IMO Number, Liner or Tramper
- Name of ship owner, agent and operator
- Kind of sea transportation (domestic, special, international navigation)
- Arrival & departure date and time
- Previous calling port & destination port
- Name of scheduled wharf and duration of its usage
- Handling goods (non-container, container (20', 40', boxes and tons, loading and unloading)
- Name of stevedoring company
- Business certification No. and issued date
- Disembarkation and embarkation of passengers (number, purpose and origin place)
- Loading and unloading plan (volume and means of transportation outside port)
- Attached paper (Copy)

- Master Cable (Arrival news of ship by radio or ship's master)
- Cargo manifest (shippers, consignees, quantity, description, weight, freight term)
- International ship security certificate
- Ship activity certificate (only for international and tramper)

The loading and unloading plan is submitted at request of terminal operation services. The followings are necessary information at that time.

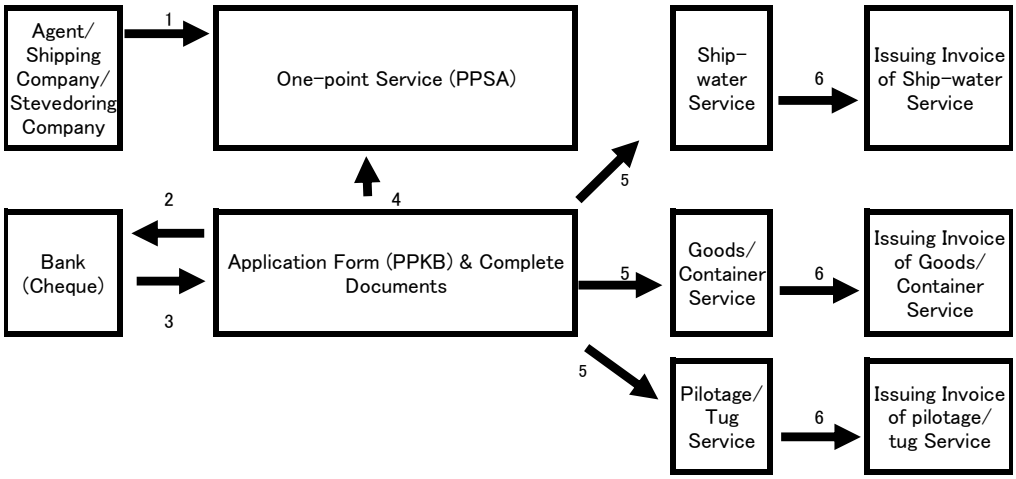
- Cargo manifest
- Storage plan
- Special cargo list
- Loading list and shipping order

The Branch Office of PELINDO III provides one-stop service for shipping lines, stevedoring companies and forwarding companies. That means port users can request several port services to the Branch Office simultaneously at the same place. The services that users can request to the Branch Office are pilot service, tug service, berthing service and ship-water supply service. The request document should be submitted a day before operation. Every morning except for weekends the terminal manager of the Branch Office and the terminal users have a meeting together in one place to determine the operations for the next-day of each terminal. Loading and unloading activity is controlled and supervised by branch officers and measurement and correctness of goods are also checked together with the stevedoring company at the terminal.

As for pilot and tug services, TPS's users have the first priority to use them. They would simply inform of the the arrival and departure time of their ships to the Branch Office 48 hours before ship's arrival. The Branch Office provides a pilot boat and tug boats for a TPS user in accordance with its request. The rest of users likewise follows the same one-stop procedure. If a ship is grater than 500 GT, is then a requirement for pilot assistance. Simialrly, shipping companies or agents must submit application forms 48 hours before its arrival. The meeting for coordination is likewise held every morning. Ships of private berth users must follow the same procedures as well.

Figure 3.1.8 shows the procedure of one-stop service, while Table 3.1.14 enumerates necessary documents at certain steps on the ship service procedure.

Figure 3.1.8 One-Stop Service Procedure by the Branch Office



Source: PELINDO III
Note: Number means the sequence of the procedure.

Table 3.1.14 Necessary Information for Ship Service Procedure

I Outer side to Anchoring Area	6 Notification of Loading/Unloading Work
1 A Letter of Credit	7 Declaration Letter of Loading/Unloading Work
2 Ship Charterd Document	8 Receipt of partial payment on a Debt
3 Ship Schedule	9 International Ship Security Certificate
4 Ship Master	III Mooving from Mooring Pool
5 Bill for Payment	1 Details of Bank Check
II Mooring Service from Anchoring Area	2 Original Additional Bank Check
1 A Letter of Credit	3 Receipt of partial payment on a Debt
2 Cargo Manifesto	IV Going out from Mooring Pool
3 Shipping Instruction	1 Details of Bank Check
4 Notification of Ship Arrival	2 Original Bank Check
5 Master Cable	3 Receipt of partial payment on a Debt

Source: Based on the information of ADPEL, PELINDO III

f. Business Entity of Port Management

Port management is a profitable business, but various port facilities in good condition need a certain amount of money. And the management body also needs funds for future capital investment, including funds to recoup past investments.

Port charges are collected by port management bodies, and most of charges are collected by the Branch Office of PELINDO III. The navigation charge is collected by ADPEL Tanjung Perak, but it is forwarded to DGSC. However, there funds are not earmarked and it is not certain that the collected navigation charge would be used for maintenance of the channel and navigation aid equipment.

Moreover, TPS and BJTI collect charges for handling service as shown in Table 3.1.15.

Table 3.1.15 Kind of Charges and Collecting Body

Kind of Charge	Collecting Body	Note
Navigation Charge	Harbor Master (ADPEL)	Set up at 2000 Charge is based on GRT
Port Charge	PELINDO III	Charges are based on GRT
Hatbour Berthing/Staying Charge		
Pilot Service Charge		
Tug Service Charge		
Quay/Pier Usage Charge	PELINDO III/TPS	Charges are based on ton/m3/box
Handling Charge	TPS/BJTI	Charges are based on ton/m4/box
Warehous/Open Shed Usage Charge	PELINDO III	Charges are based on ton/m5/box

Source: Based on the hearing by the Study Team

g. Maritime Safety and Security

Port security and safety as well as sea traffic in territorial waters and in ports are under the supervision of ADPEL and. under ADPEL, three entities are responsible for safety and security enforcement as follows: (i) Coast guard (KPLP), (ii) Ship security, and (iii) Sea traffic and harbor affairs. KPLP is responsible in the area of (i) providing safety and rescue services, (ii) dealing with oil spills, (iii) firefighting, and (iv) patroling along coastal sea. There are 300 staffs engaged in such services at KPLP.

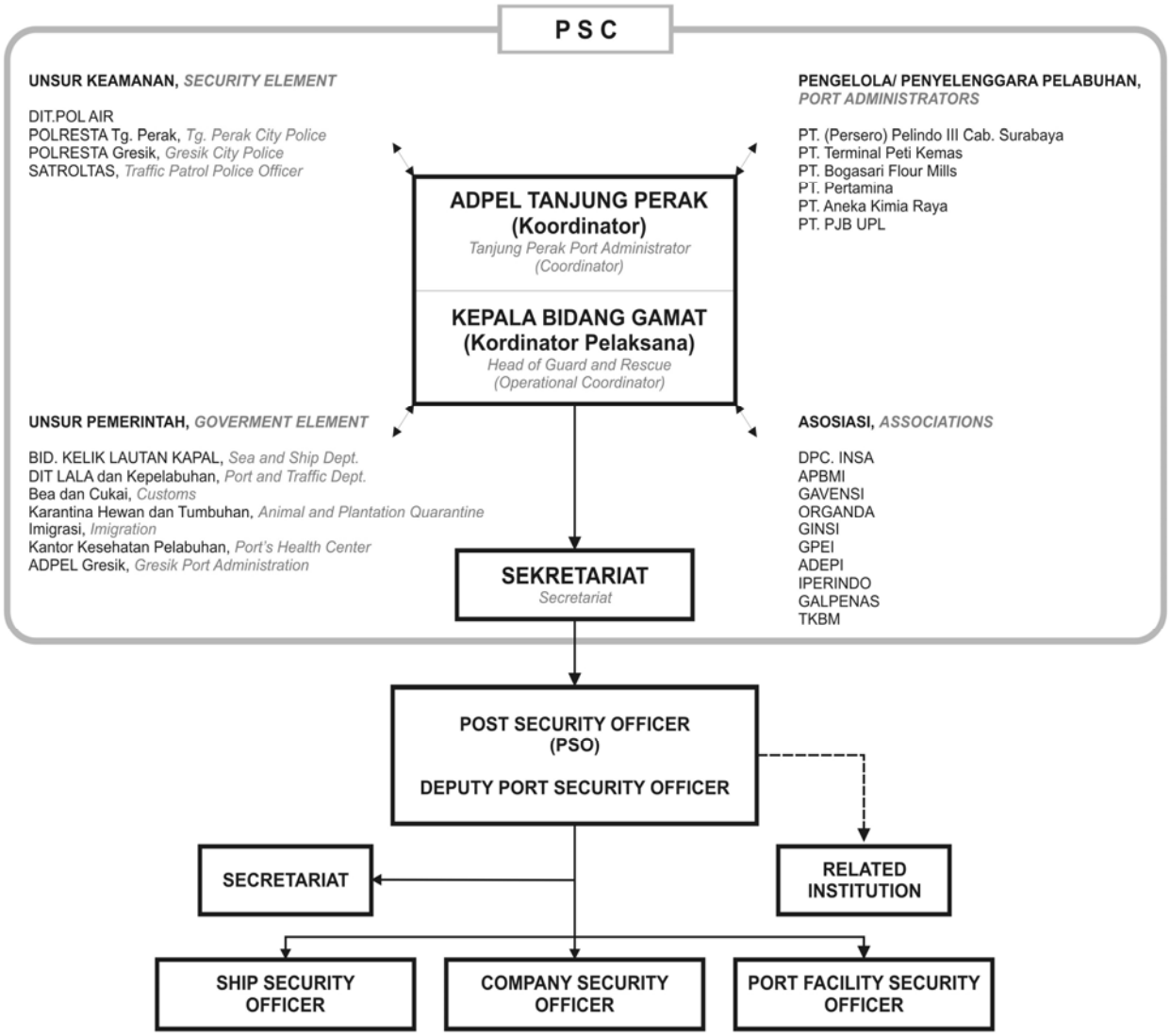
Responsibility for oil prevention and control of marine pollution on a national level lies with the DGST and it is through the National Operations Centre for Oil Pollution under DGST. Once activated, the line of command passes through regional offices at DGST site and three sub-regional offices at ports with adequate facilities to the on-scene commander and port administrator. The state oil and gas company (PERTAMINA) is the operational supporting agency together with other related government and industrial estates. BAPEDAL is the designated agency for environmental damage assessment.

Port state control, i.e. the inspection of foreign ships to verify the condition of ship and equipments in compliance with IMO requirements, is operated through the safety department under ADPEL's supervision.

This risk management concept is embodied in the ISPS Code through functional security requirements for ships and port facilities. For ships, these requirements will include: (i) ship security plans, (ii) ship security officers, (iii) company security officers, and (iv) certain onboard equipment. For port facilities, the requirements include: (i) port facility security plan, (ii) port facility security officer, and (iii) certain security equipments (such as fences, lights etc.). Additional requirements for ships and port facilities include: (i) monitoring and control access, (ii) monitoring activities of people and cargo and (iii) ensuring security communications.

Below is the organizational structure for Port Security Control: ISPS code operation at Tg. Perak and Gresik port.

Figure3.1.9 Operation of ISPS Code



Source: PELINO III

h. Vessel Traffic Management

AIS (Automatic Identification System): An automatic ship identification system has been introduced by an assistance of Denmark and managed at ADPEL Tg. Perak Office as shown in Figure 3.1.10. It can cover the whole Surabaya port area from West Channel to East Channel.

The location, name, flag and other information of ships in the port can be shown on a monitor screen in the control room. This function, however, can be effective only for ships which have AIS on board. Thereby, most of local ships are undetectable, because they do not have such equipemt.

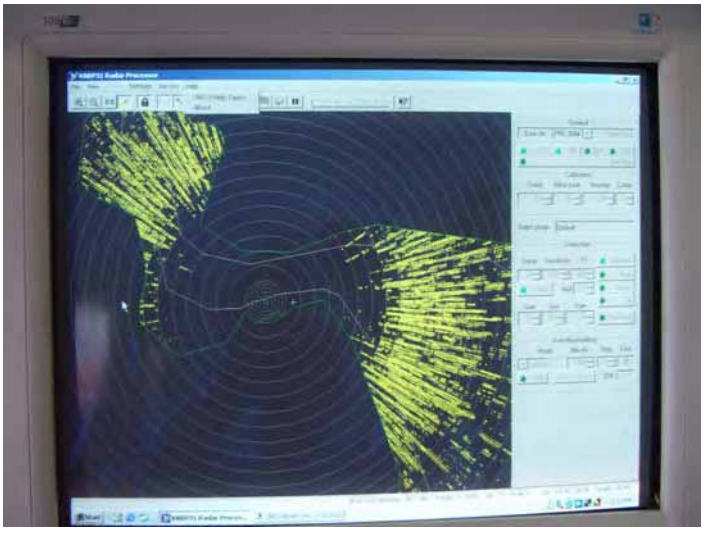
Figure3.1.10 AIS at ADPEL Tg. Perak

Source: JICA Study Team

VTS (Vessel Traffic Service) System: In addition to AIS, ADPEL has a radar and a VHF communication system. Unfortunately the radar system has problems in its coverage and image on screen. The coverage is not enough for the whole Surabaya Channel area and the image is not clear with strong shadows.

For the VTS system, a wide range and high resolution radar is indispensable. It is also necessary to discuss various institutional arrangements for effective operation and management of the system to control vessel traffic in the port, including the channels.

Figure3.1.11 Radar Image at ADPEL Tg. Perak



Source: JICA Study Team

3.2 Tanjung Perak Port

1) Port Infrastructure and Equipment

a. Port Overview

Port of Tanjung Perak is located along the strait of Madura, to the north of the city of Surabaya with Madura Island acting as a natural breakwater for the port.

The water current along the strait is so high that the depth of the strait has been maintained to sufficient level for ship navigation for some time. However calling-ship sizes have been increasing year by year, thereby requiring some part of the channel to be periodically dredged.

Both sides of the Port are adjacent to the navy area and the front side faces the channel and those water areas are now used for anchorage for a lot of ships. That means there is no space available to enlarge the port territory in Port of Tanjung Perak and that is why a new development project is considered in Lamong Bay which is located close to Tanjung Perak, but not adjacent to it.

b. History of Port Expansion

The first sea-port at Surabaya area was opened at Jembatan Merah adjacent to the old city center of Surabaya. It was located along Kalimas River. In 1875, the plan to construct an outer port at Tanjung Perak was proposed in order to be able to handle sea-cargoes directly without using barges or small boats. At the beginning of the 20th century, a more realistic plan was introduced and the construction work started in 1910 by the Dutch government and resulted in the current configuration of the existing port.

After the independence of the country, a state company was established for managing the port. In 1985, Mirah terminal was completed as interisland terminal using ADB fund and the passenger terminal was opened at the north of Jamrud Terminal. Next to the passenger terminal, a ferry terminal was built for passenger traffic between Surabaya and Madura with 24 hours service.

In 1992 and 1994, new facilities for interisland traffic and dry bulk handling were constructed at Gresik Port. The handling of dry-bulk cargos were then partially transferred from Tanjung Perak Port to Gresik Port.

In 1992, the container terminal was constructed in order that Tanjung Perak would have more strategic role as one of the national gateway port, and a further 500m of quay was constructed in 1997 to deal with the increasing container traffic.

In 1995, PELINDO III was established as a private company though it is owned by the central government, but nonetheless has certain autonomy to construct facilities and manage the ports. In 1999, PELINDO III corporatised the container terminal operations, hence forming PT Terminal Petikemas Surabaya (TPS) and an additional 500m of international quay and 450m of domestic wharf were commissioned to TPS. At the same time 49% of its shareholdings were purchased by P&O Ports, Australia.

In 2002, PT Berlian Jasa Terminal Indonesia (BJTI) was established and commissioned to operate Berlian Terminal. It was a former working division of PELINDO III Tanjung Perak Office and the division has operated the terminal since 1974. The division stood on its own and started the terminal operation business. PELINDO III owns 95% of its shares.

In 2006, P&O Ports was purchased by Dubai Port World (DPW), and TPS terminal is now operated by the joint company owned by PELINDO III and DPW.

c. Berthing Facilities

The port of Tanjung Perak has berthing facilities as shown by type of berth in Table 3.2.1. There are 8 terminals, namely TPS (Terminal Petikemas Surabaya or Surabaya Container Terminal), Jamrud Terminal. Ro-Ro Terminal (Perak Terminal), Mirah Terminal. Intan Terminal, Berlian Terminal, Nilan Terminal and Kalmias Terminal (see Figure 3.2.1).

Table 3.2.1 Berthing Facilities in Port of Tanjung Perak

Type of Berth	Name	Length (m)	Depth (m)
Container (International)	TPS (Terminal II)	500	-10.5
	TPS (Terminal III)	500	-12.0
	Berlian Timur	420	-9.7
Container (Domestic)	TPS (Inter Island)	450	-10.5
	Berlian Barat	700	-8.2
	Berlian Utara	140	-9.0
Container, G.Cargo, Liquid/Dry Bulk (Domestic)	Mirah	640	-6.7
Container & General Cargo (Domestic)	Nilan Timur	860	-9.2
General Cargo (International)	Jamrud Utara	700	-9.1
General Cargo (Domestic)	Jamrud Selatan	800	-7.5
General Cargo (Domestic)	Jamrud Barat	210	-8.2
Liquid/Dry Bulk (International)	Berlian Timur	365	-9.7
Local Ship & Sailing Vessel	Kalimas	2,270	-2.0
Bunker Service Vessel	Intan	100	-4.0
Ro-Ro	Perak	140	-7.2
Passenger	Jamrud Utara	500	-9.0

Source: PELINDO III

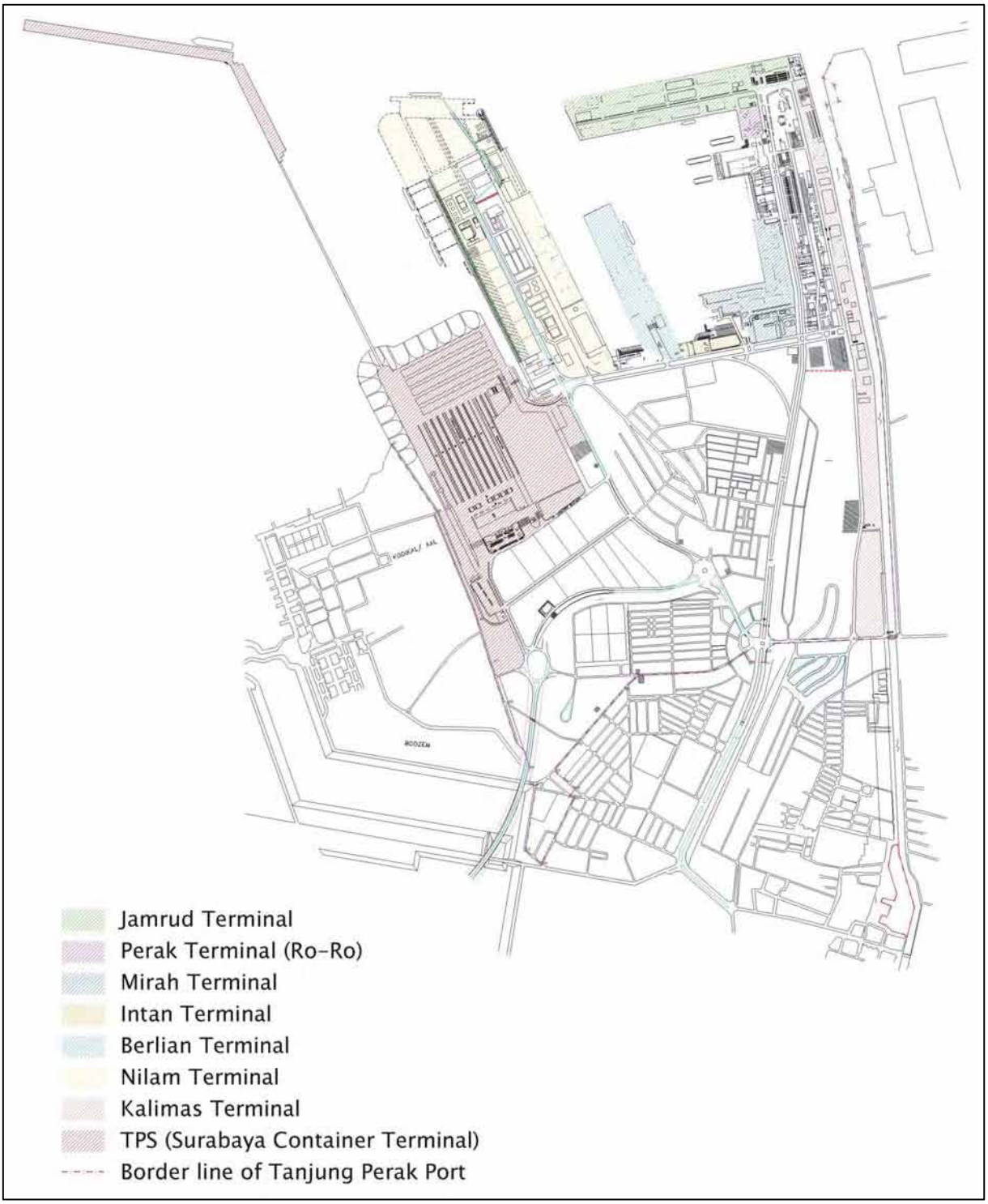
d. Container Terminals

There are two container terminals, TPS and BJTI, with TPS having international standard facilities while BJTI does not have any gantry-crane. The salient features of the terminals are shown in Table 3.2.2.

TPS (Terminal Petikemas Surabaya: Surabaya Container Terminal): The existing terminal opened for business with 500m quay in 1992. PELINDO III corporatized its container terminal operation and 49% of its shares were transferred to P&O Ports Australia in 1999. At the same year an additional 500m quay for its international ships and 450m quay for interisland ships were commissioned for business. The current terminal handling capacity is said to be 1.8 million TEUs per annum. It has container handling equipments which are of international standard as well as other relevant facilities. The shares of P&O Ports were purchased by Dubai Port World in 2006.

BJTI (Berlian Jasa Terminal Indonesia): BJTI was established by PELINDO III in 2002. The northern part of Berlian Timur terminal was converted into a container terminal in 2003. Berlian Barat terminal is the first container quay of Tg. Perak Port, primarily for interisland ships. In 2006, BJTI provided stacking yard for international containers and started to accommodate international container ships at a section of Berlian Timur. Besides the container terminal, BJTI also manages conventional cargos such as break bulk and oils at the southern part of Berlian Timur.

Figure 3.2.1 Terminals in Port of Tanjung Perak



Source: PELINDO III

Table 3.2.2 Container Terminals of Tanjung Perak

Location	Terminal I Berlian Utara	Terminal II TPS	Terminal III TPS	Inter Island TPS
Managing Company	PT. BJTI	PT. Terminal Petikemas Surabaya		
Draft	-9.0m	-10.5m	-12.0m	-10.5m
Berth Length	420m	500m	500m	450m
Quay Crane	2 Units (35T)	11Units (40t)		
Apron Width	25m	50m	50m	50m
RTG/Yard Crane	4/2	23 RTGs		
Reefer Plug		113	*112	
CFS	4,400m^2	10,000m^2		
Head Truck 48		52 Units		
Chassis 20"//40"		103 Units		
Container Yard	0.2ha	12ha	12ha	10ha
Block	4	8	9	
Lot	28	60	63	
Row	3	7	7	
Ground Slot	33.6	9,500		
Capacity	40,000TEUs	500,000TEUs	500,000TEUs	400,000TEUs

Source: Port of Tanjung Perak Profile, TPS

e. Conventional Terminals

There are 5 terminals for conventional cargos; namely, Jamrad, Mirah, Berlian, Nilam and Kalimas Terminals in addition to the Intan (for bunkering) and Ro-Ro Terminal (see. Table 3.2.3).

Table 3.2.3 Conventional Terminals of Tanjung Perak

Name of Terminal	Jamrud	Mirah	Berlian	Nilam	Kalimas	Intan	Ro-Ro Terminal
Construction Time	1910s	1985	1920s	1910s	1910s	1910s	1910s
Length(m)	2,209	640	1,625	860	2,270	100	140
Depth(m)	-7.5～9.1	-6.7	-17.9	-9.2	-2.0	-4.0	-7.2
Apron Width (m)	15	20	15	15	20	20	
Type of Structure	Caisson	Pile Structure	Caisson	Caisson	Caisson	Caisson	Caisson
Max Ship Length to Accommodate (m)	240	140	270	240	40		120
Handling Commodities	General Cargo /Passenger(-9 m deep, 500m long)	Container/ General Cargo	Container/Bulk Cargo/ Liquid Cargo	General Cargo/ Bulk Cargo/ Log	General Cargo	Bunker Service	Passenger
Facilities at Yard	Ware Houses/Cargo Yard/Passenger Terminal	Container Yard/Ware Houses	Container Yard/Ware Houses	Ware Houses/Cargo Yard	Ware Houses		Passenger Terminal

Source: PELINDO III

Jamrud Terminal: Jamrad Terminal is the busiest among conventional terminals. It is for general cargos and its warehouses are fully used for temporary storage. Container cargos are also handled there, because domestic general cargos have been increasingly containerized year by year. The depth of berth is -9m which is enough for interisland ships, but its length is not long enough. The quayline of Jamrad North is 1,200m, but 500m is used for passenger boats.

Mirah Terminal: Mirah Terminal is the newest of the conventional terminals when it was reworked in 1985. A part of the terminal was recently modified for interisland container ships which arrive twice a week. There are two warehouses but are mostly empty. The port is not

suited for container handling, because the breadth of the terminal is not wide enough .Other parts of the terminal are used for general cargo handling and for offshore equipment base.

Berlian Terminal: As mentioned earlier, Berlian Terminal is managed by BJTI and handles both container cargos and conventional cargos.

Nilan Terminal: Nilam area has the widest area among the conventional terminals. The shoreline of the terminal is almost 3km long, but the public berth is limited only 930m. The rest of the shoreline is used exclusively by industrial companies. It is also the only break-bulk terminal in the port, though handling of break-bulk cargos have been mostly transferred to Gresik Port already.

Kalimas Terminal: Tanjung Perak started their port activity at Kalimas Terminal in the middle of 19 century. It is located along the river of Mas and during its heyday a lot of boats sailed up the river to Jembatan Merah which was the old city center.The length of the terminal is more than 2.5km long and half of the terminal is used for small interisland ships. Those ships are berthed vertically and the cargos are handled mannually. But these days some of the general cargos are being transported in modified small containers (not suitable for standard container handling), which means that some form unitization is being looked into even for small cargo lots. The rest of the terminal is used for ship repairing work and mooring. These ships are not being charged for mooring at present.

Intan Terminal: Intan Terminal is adjacent to Jamrud terminal. The berth is 100m long and is used as a tanker berth.

Ro-Ro Terminal: Ro-Ro Terminal was previously called Perak Terminal and used for general cargos and passengers, but now it has been changed to a Ro-Ro Terminal.

Passenger Terminal: There are two passenger terminals, Jamrud and Kalmias. Jamrud terminal is for interisland passenger ships and Kalimas terminal is for ferry boats.

f. Exclusive Use Facilities

There are 5 facilities used exclusively by certain firms in Tanjung Perak Port. Those lands are owned and leased to specific companies by PELINDO III. Some berthing facilities are owned by PELINDO III while others are constructed by BOT scheme. However, all of superstructures are owned by the respective firms. Table 3.2.4 shows the major firms, which have exclusive facilities at Tanjung Perak Port.

Table 3.2.4 Direct Marine Activities of Main Companies in Tanjung Perak Port

Company name	PT. Pertamina	AKR	BOGASARI, PT.	PUSRI	PT. DOK
Company type	State-owned	Private	Private	State-owned	State-owned
Land Property	PELINDO III	PELINDO III	PELINDO III	PELINDO III	PELINDO III
Business Activity	Oils	Chemical/ Fuel Oil	Flour	Fertilizer	Ship Yard
Berthing Facility	D: 9-11m	L: 100m, D: 9-11m	L: 250m, D: 9-11m	L: 100m, D:6-7m	L: 140m, D: 6-7m
Handling facility	Pump	Pump	Pneumatic	Conventional	
Handling Capacity		1,500 l/day	6,000 t/day	3,000 t/day	
Handling Record (2006)		Chemical 251,937t, Fuel Oil: 91,000t	1,1174,614t	48,704t	Maximum ship building: 17500DWT
Remarks		The area will be enlarged in the near future and be used as multi purpose berth			Land: 57ha, Water: 35ha, consession will be finished in 2015

Source: PELINDO III

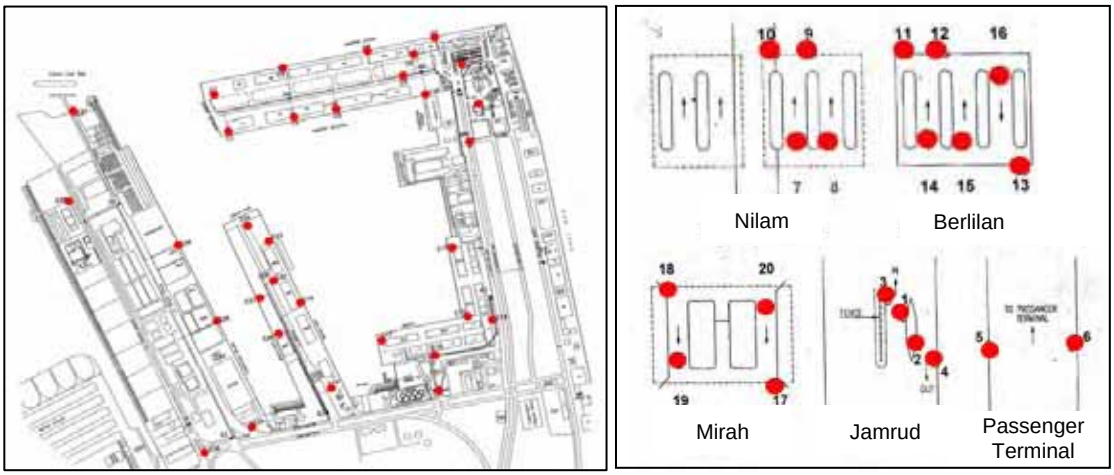
g. Port Facility Security System

Tg.Perak: Indonesia is a member of the International Maritime Organization (IMO). The IMO adopted "the International Ship and Port Facility Security Code" in 2002, which prescribed necessary security measures to be taken at the ports of the member countries. The code was scheduled to be implemented by 1 July 2004, including such measures as introduction of gate check system, security facilities (such as fences, lights and the closed-circuit television (CCTV) system, X-ray inspection system for checking cargoes, etc.) and others

There are 13 organizations in Tg. Perak which are related to security of the port, i.e. ADPEL, Coast Guard, the Navy, Port Police (KPPP), Pelindo III, etc. The Port Security Committee (PSC) is organized to coordinate their activities. Security facilities are operated by Tg. Perak Branch Office of Pelindo III, in which the Port Facility Security Officer (PFCO) is assigned.

In Tg. Perak, a CCTV system with 32 cameras was introduced at most of the wharves already in 1998. In 2005, additional CCTV system was installed at five gates in the port with 20 CCTV cameras, were installed by a grant of JICA. These facilities are controlled and managed by Pelindo III at the central control room.

Figure 3.2.2 Arrangement of CCTV Cameras in Tg. Perak



Source: PELINDO III (right: installed by a grant of JICA)

TPS: The security system of TPS consists of the following :

i) Fences: TPS is enclosed by fences. Introduction of an Infra-red sensor system is under consideration.

ii) Gate check: Registration and check of the trailer/truck drivers, issuance of an admission card to vehicles, weight check of trailers by 15 weigh bridges, personnel check by name card and Hand Punch Recognition System, etc.

iii) CCTV system: There are 26 cameras in TPS, in which six are arranged on the jetty. The monitor is managed in the control room.

iv) Radio communication among security officers

v) Patrol by three pickup trucks

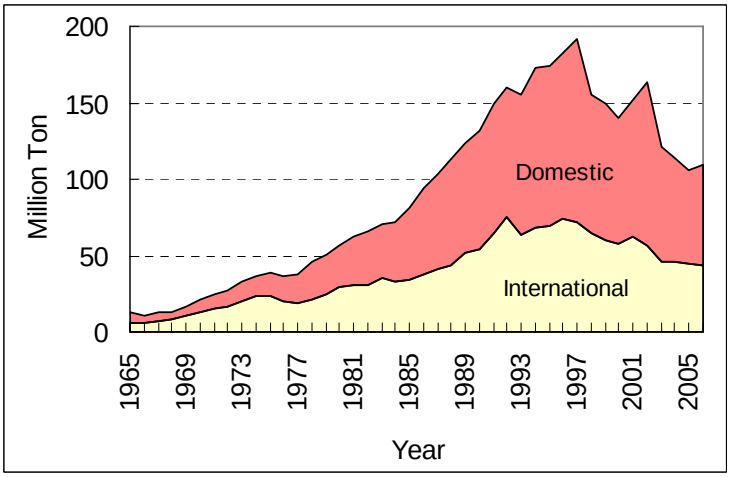
In TPS an independent CCTV system is installed and managed by the Customs. An X-ray inspection system was introduced in 1998 by a grant from the Dutch Government. It has been used only by the Customs for checking contraband in containers.

2) Port Traffic

a. Non-Container Cargo Throughput

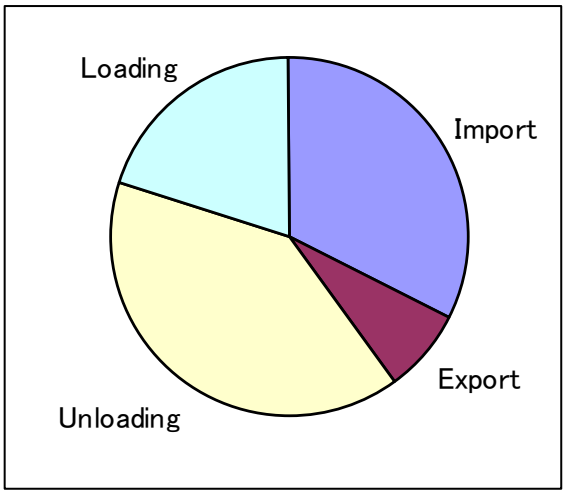
Port activity has been growing year by year until 1997. After the economic recession, the international trade and the domestic trade through the port has been decreasing at a significant rate as illustrated in Figure 3.2.3. The cargo throughput in 2006 is almost 11 million tons, less than 60% of the peak year. The international and domestic cargos are account for 40% and 60% respectively; and, domestic unloaded cargo exceeding domestic loaded cargo. As shown in (Figure 3.2.4).

Figure 3.2.3 Perak Cargo Throughput (1965-2006)



Source: PELINDO III

Figure 3.2.4 Perak Cargo Throughput in 2006



Source: PELINDO III
Note: Import and Export cargo are intenational-bound cargo; while, Loading and Unloading cargo are domestic-bound cargo

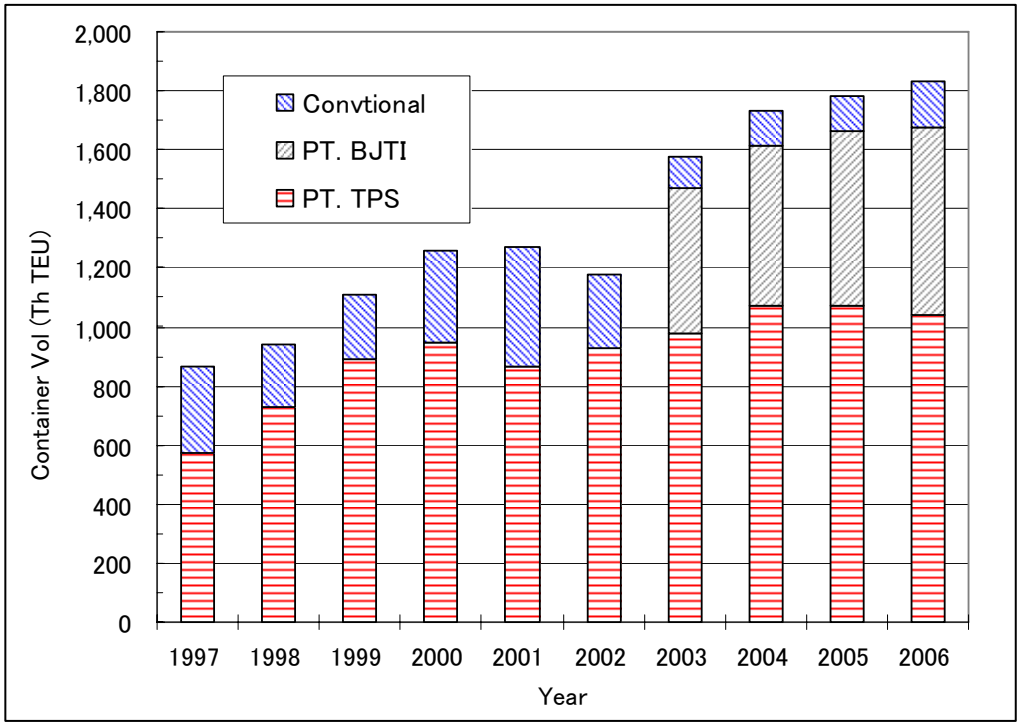
b. Container Cargo

Containerization is a worldwide phenomenon and the current situation in Surabaya port is almost same as in in other major ports. Figure 3.2.5 shows the container throughput at Tanjung Perak Port, wherein container throughput has been increasing gradually, and reached 1.85

million TEUs (1.51 million boxes) in 2006, including international and domestic containers. The growth of domestic containers is much higher than that of international containers.

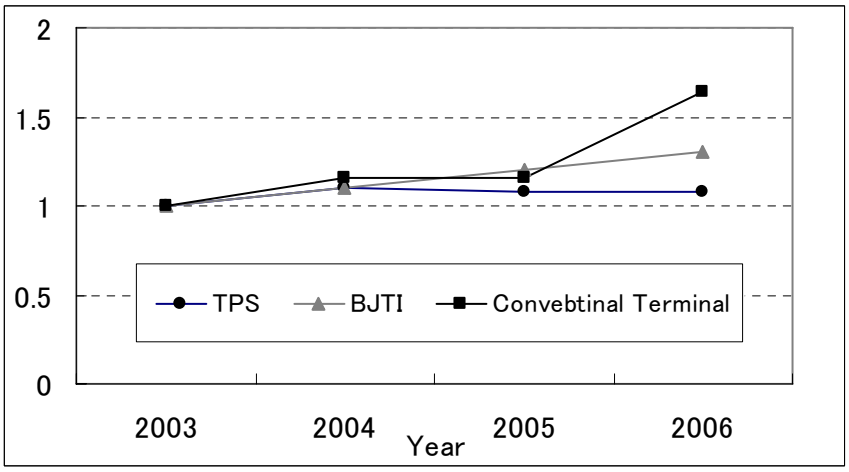
Most of container handling is done at TPS, but since BJTI opened its container terminal in 2003, it has rapidly increased its share of container cargo handling because of its cheaper charge than that of TPS. Interisland containers are mostly handled at BJTI, but because of lack of space, some of the interisland containers have to be handled at conventional terminals This is the primary reason why since 2003 container being handled at conventional terminals is increasing (see Figure 3.2.6).

Figure 3.2.5 Container Throughput at Tj. Perak (1997-2006)



Source: PELINDO III ,TPS and BJTI

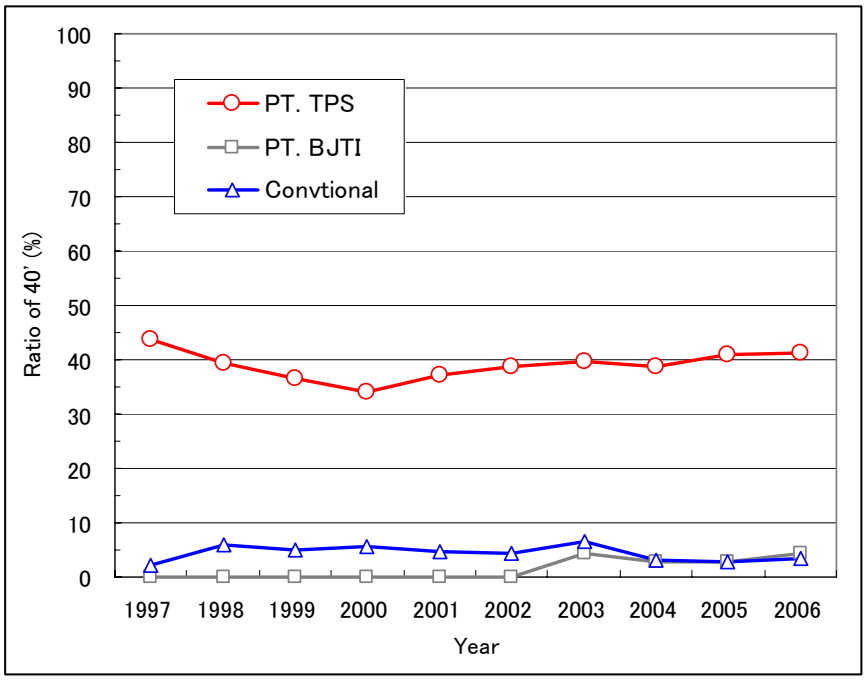
Figure 3.2.6 Increase of Container Handling per Terminal since 2003



Note: 2003 values = 1.00
Source: PELINDO III ,TPS and BJTI

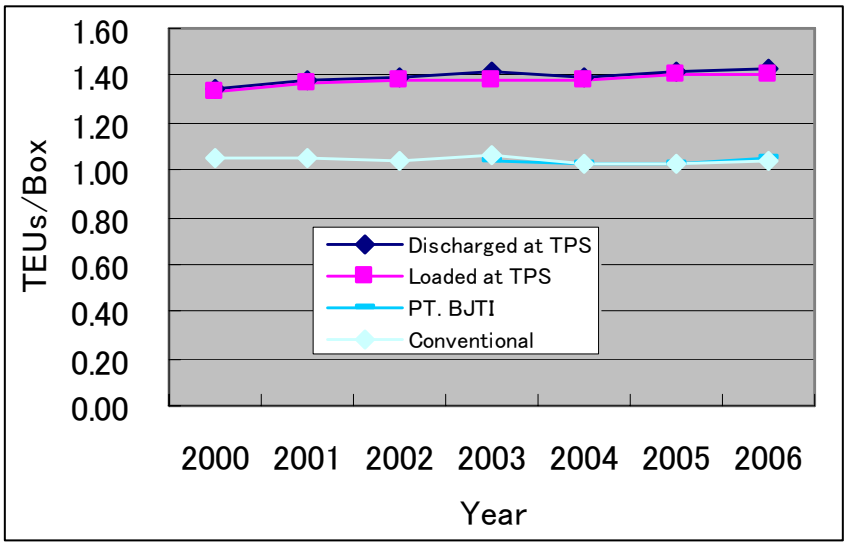
One of the parameters to be taken into consideration in container port planning is the composition of container box sizes, i.e. ratio of 20 and 40 footers. The Figure 3.2.7 shows the trend of the ratio of 40 footers for the past 10 years at PT. TPS, PT. BJTI and conventional berths.It seems characteristic of Tanjung Perak that the ratio of 40 footers has not increased in the past years, maintaining about 40% at TPS, and 4% to 5 % at other berths As a result, the average TEUs per box has more or less remained unchanged, and it is almost constant both at inbound and outbound at TPS (see Figure 3.2.8).

Figure 3.2.7 Ratio of 40 Footers at Tj. Perak



Source: PELINDO III ,TPS and BJTI

Figure 3.2.8 Average TEUs per Box at Tj. Perak

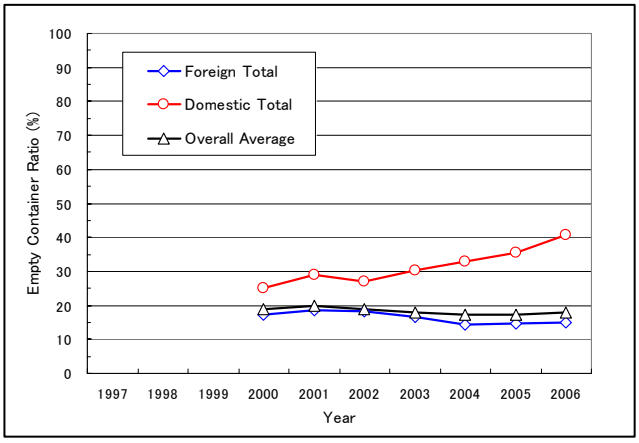


Source: PELINDO III ,TPS and BJTI

Another important parameter is the ratio of empty containers against total containers handled. Figure 3.2.9 and Figure 3.2.10 shows the ratio of empty container for various classifications of containers through TPS, illustrating that the empty container ratio (TEU basis) of foreign

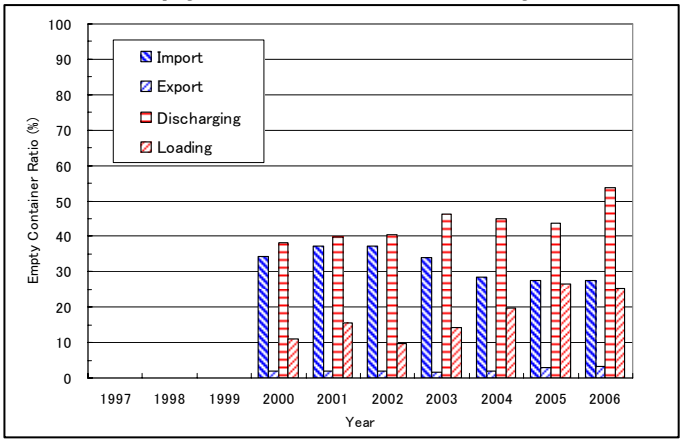
containers are small, i.e. less than 20 %, whereas, the empty container ratio of domestic containers is high, i.e. increasing up to 40 % in 2006. Figure 3.2.11 illustrates the same empty container ratio at BJTI and conventional terminals with more or less a stable ratio of 25% to 35%.

Figure 3.2.9 Empty Container Ratio at TPS in Aggregate



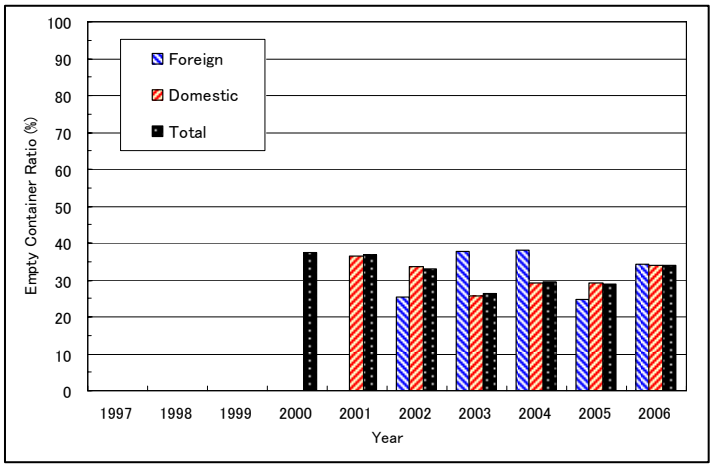
Source: TPS Note: TEU basis

Figure 3.2.10 Empty Container Ratio at TPS by Traffic Movement



Source: TPS

Figure 3.2.11 Empty Container Ratio at BJTI and Conventional Terminals

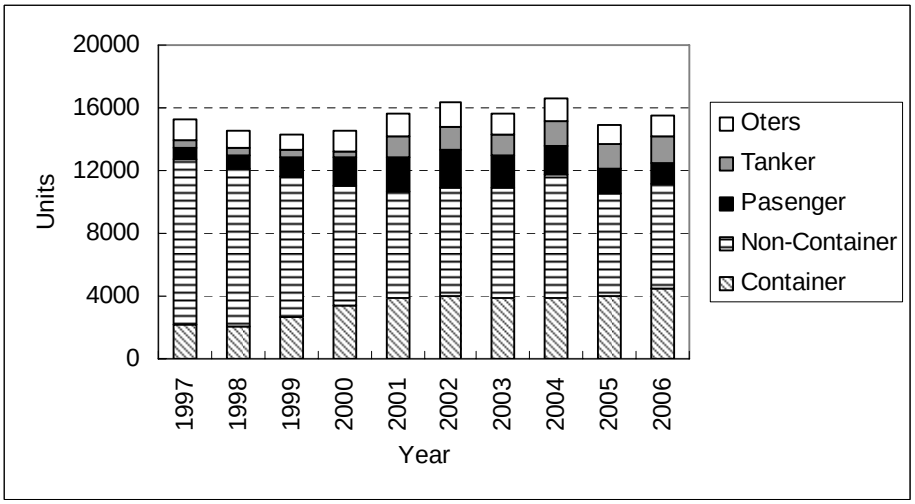


Source: Tg. Perak Office, Pelindo III

c. Ship Call Characteristics

The number of ship calls in 2006 was 15,467 units but the number of vessels entering the port has almost remained constant in these last 10 years as shown in Figure 3.2.12. However ship type composition has been steadily changing as container ships has been increasing, while non-container ships and passenger ships have been gradually decreasing.

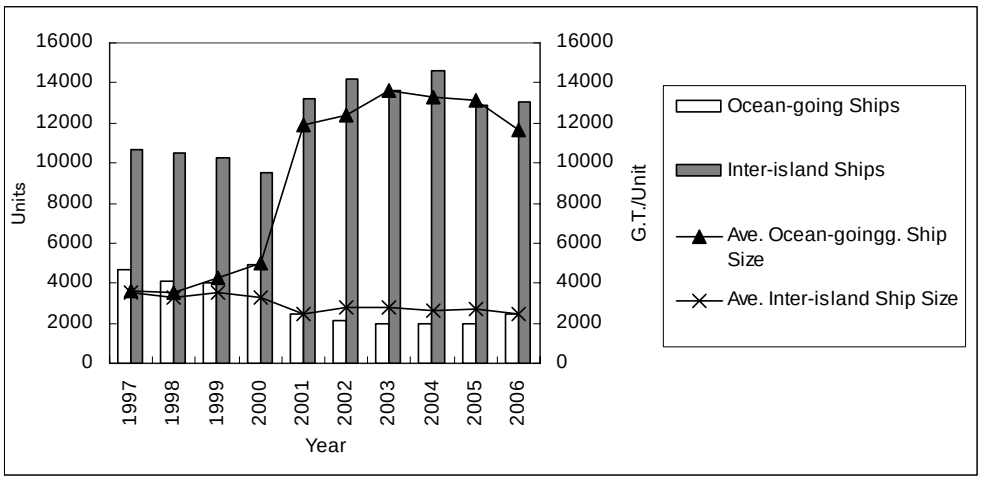
Figure 3.2.12 Number of Ships Calling at Tg. Perak (97-06)



Source: Tg. Perak Office, Pelindo III

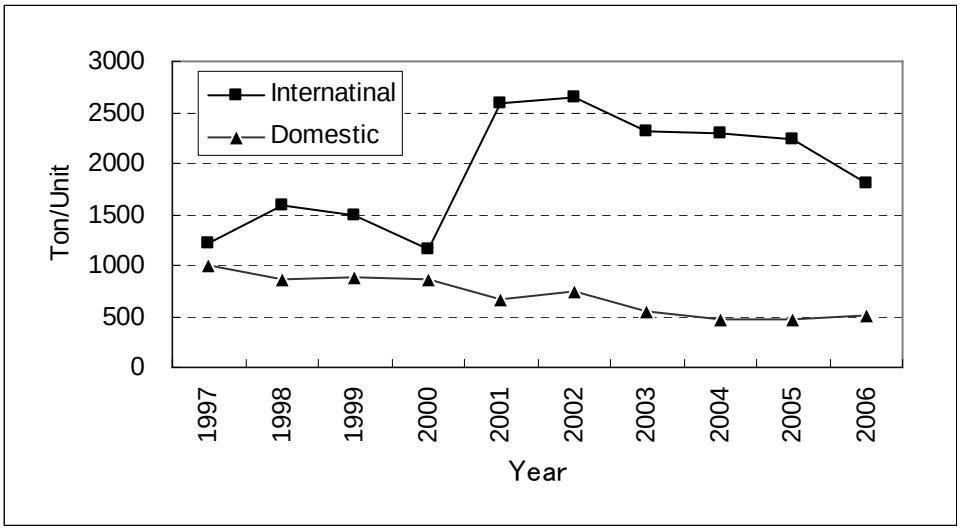
The number of ocean-going ships calling at Tanjung Perak decreased suddenly in 2001 as shown in Figure 3.2.13, however average cargo handled per ship increased in 2001 as shown in Figure 3.1.14. This is a result of larger ships being assigned to call at Tanjung Perak. On the other hand the average ship size for interisland services has been decreasing year by year.

Figure 3.2.13 Number of Ship Call & Average Ship Size (97-06)



Source: Tg. Perak Office, Pelindo III

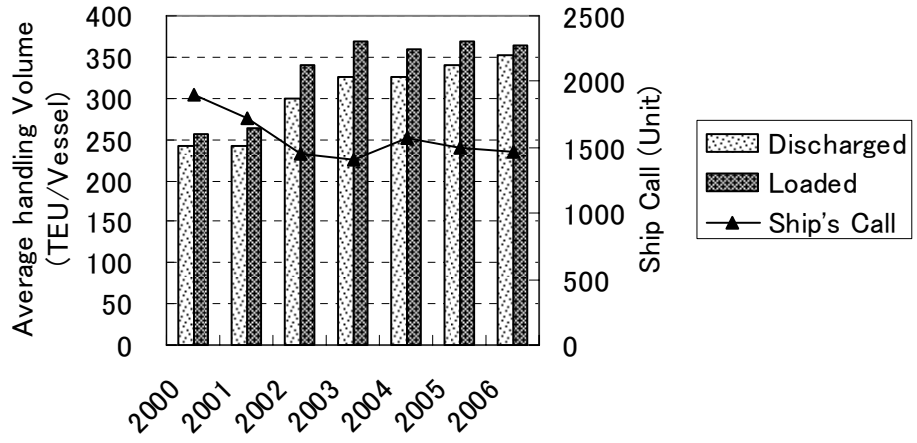
Figure 3.2.14 Average Cargo Handled per Ship (97-06)



Source: Tg. Perak Office, Pelindo III

Figure 3.2.15 shows ship call and average container cargo handled per ship at TPS. The number of ship call is around 1500 vessel per year, while the average cargo handled per ship is around 360 TEUs for loading and 350 TEUs for discharging. Average loading cargo volume has been almost unchanged for the last 5 years, while the average discharging volume has been increasing a little year by year. It is noted that the TPS's data includes international and interisland figures in calculating for the average.

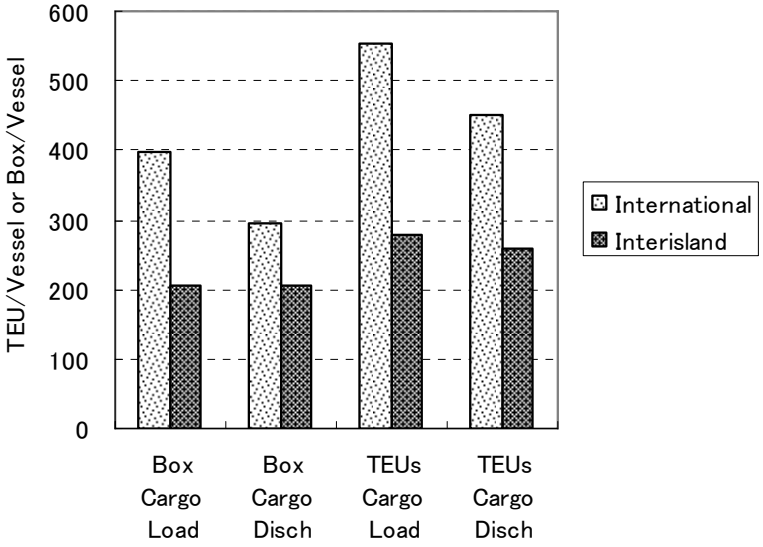
Figure 3.2.15 Average Container Cargo Handled per Vessel (TPS)



Source: TPS

Figure 3.2.16 average container cargo handled per ship, and differentiating between international and interisland traffic, though based only on one shipping company's data. The average number of the international container cargo handled is 560 TEUs/vessel for loading and 450 TEUs/vessel for discharging. The boxes handled per vessel is about 30% smaller than the number based on TEU, which means that about 30% containers are bigger than 20 foot containers, such as 40 foot containers. On the other hand, the number of interisland container is handled 200 boxes/vessel and less than 300 TEUs/ vessel.

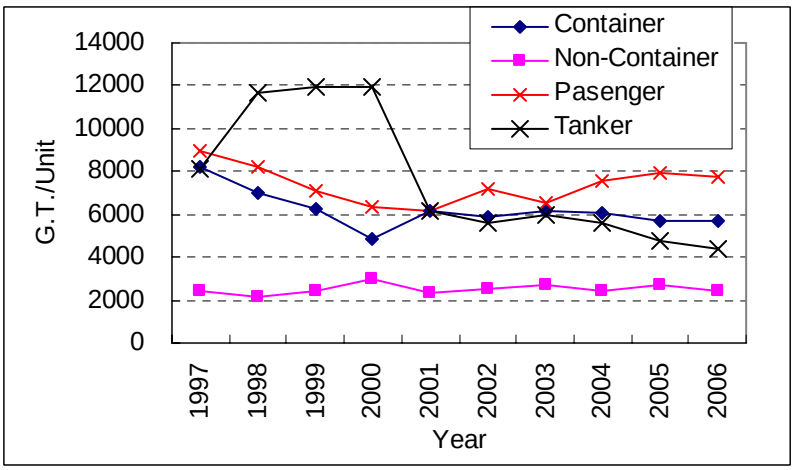
Figure 3.2.16 Container Handled Volume per Vessel (International and Interisland Traffic)



Source: Tg. Perak Office, Pelindo III

Looking at the ship type, the average size of non-container ships has not changed much; however, the average container ship size has been recently decreasing to some extent as shown in Figure 3.2.17. This is due to the introduction of smaller container ships to interisland transport services.

Figure 3.2.17 Average Ship Size of Entering in Tanjung Perak Port



Source: Tg. Perak Office, Pelindo III

As for the maximum size of calling ships, a bulk cargo ship of 87,052 DWT and 225m long, was recorded as the largest ship to call at Surabaya in 2006. The largest container ship size is 32,085 GRT. Details are shown in Table 3.2.5.

Table 3.2.5 Largest Ships Called at Tanjung Perak Port in 2006

Type of Ship	Name of Ship	DWT	GRT	LOA (m)
Bulk Cargo	Alam Pesona	87,052	46,982	225
Container	Jubilee Glory	33,271	32,085	211
General Cargo	Nirefs		40,570	189
Tanker	Energy Power	51,318	30,008	183
Passenger	Bukit Siguntang		14,649	147

Source: PELINDO III

d. Terminal Working Characteristics

Table 3.2.6 shows ship call ratio by terminal for conventional terminals or Tj. Perak. Among them, Jamraud is the main terminal for conventional cargos, not only as international trade, but also as interisland trade. Nilam, Berlian and Mirah terminals are also busy ones, but they are mostly used for interisland trade. Kalimas Terminal is used only for local ships.

Table 3.2.6 Ship Call Ratio by Terminal

Item	Terminal	International	Domestic	Total
Ship Call (15,466 Units)	Jamrud	11.5	26.4	37.9
	Nilan/Berlian/Mirah	4.2	38.1	42.3
	Kalimas		19.8	19.8
	Total	15.7	84.3	100.0
GT (60,005,606 GT)	Jamrud	36.8	28.5	65.3
	Nilan/Berlian/Mirah	10.4	22.1	32.5
	Kalimas		2.2	2.2
	Total	47.2	52.8	100.0

Note: Based on PELINDO III Statistical Data

Table 3.2.7 shows ship call and container traffic at TPS. TPS terminal handled more than 700 TEUs per ship on average. Its berth occupation ratio is said to be 37% and CY occupancy ratio 32% according to the TPS public relations department.

Table 3.2.7 Ship Call & Container Flow at TPS

Year	Ship Call (A)	Container Flow (B)	B/A
2003	1,387	980,706	707
2004	1,522	1,074,505	706
2005	1,493	1,066,908	715
2006	1,471	1,053,466	716

Source: TPS

Table 3.2.8 shows ship staying average time at Tj. Perak, excluding TPS. In all, turnaround time for conventional vessels is around 80 hours, while for domestic container vessels is about 40 hours. The average waiting time of ships calling at Tanjung Perak was 2 hours, based on the information from PELINDO III. There were no ships waiting for berth for more than half a day and only 0.8% of ships waited for 6-12 hours for berthing.

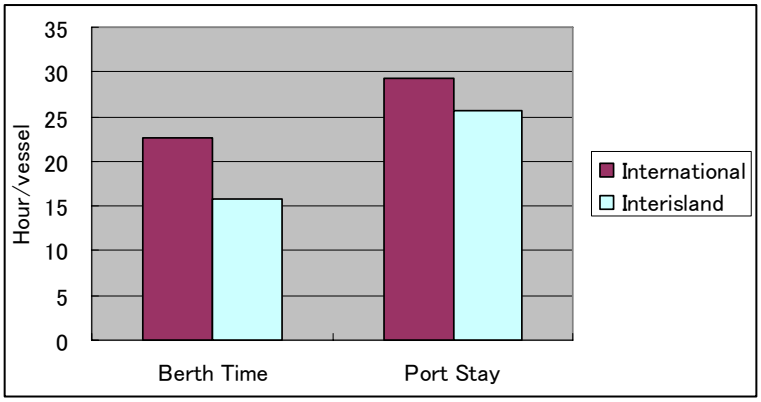
Table 3.2.8 Average Staying Time of Ships at Tanjung Perak Port (excl. TPS)

Item	International Conventional	Domestic Container	Domestic Conventional
Turn Round Time	78	39	87
Waiting Time	1	0	1
Postpone Time	21	5	16
Approach Time	4	4	4
Berthing Time	52	30	66
(Effective Time)	39	20	52

Note: Units in hours
Source: Statistical Paper of PELINDO III (2006, Actual Data)

At TPS, international container ships stay at the port for 29 hours including 23 hours berthing time on average, based on an example of a shipping company operating as shown in Figure 3.2.18. Meanwhile, interisland container ships have shorter port stay duration than the international container ships.

Figure 3.2.18 Ship Staying Average Time at TPS

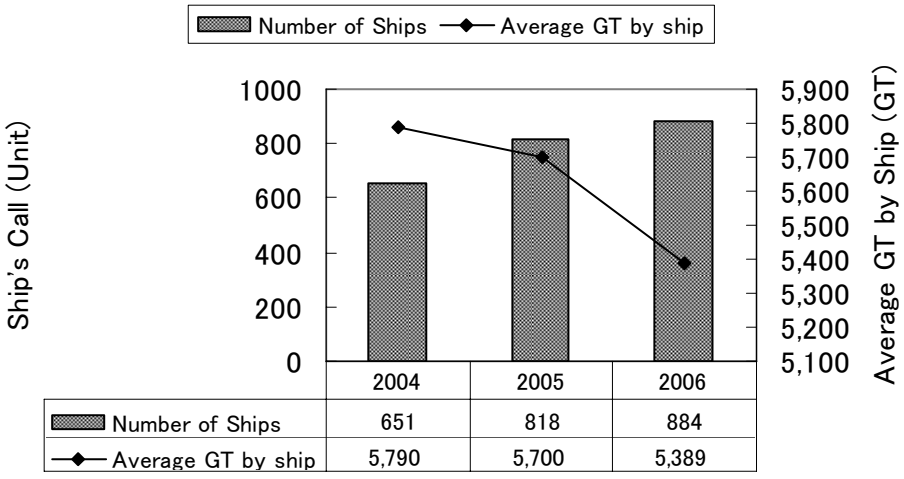


Note: Port Stay Time means the time from arriving outer anchorage area to leaving a berth. Berth Time means the time from arriving a berth to leaving a berth.

e. RoRo Traffic

RoRo ships connect to Banjarmasin, Sampit, Kumai, Balikpapan, Makassar, Pontianak, Samarinda and others. RoRo ships are handled at the corner of Jamrad Terminal, which was called Perak Terminal which was modified for RoRo ships in 2003. Before construction of the RoRo Terminal there, RoRo ships used Berlian Terminal, which is is now used for car-carriers. Figure 3.2.19 shows the number of RoRo traffic operated by two shipping lines (PT. PRIMA VISTA and PT. DHARMA LAUTAN UTAMA) at Tanjung Perak Port. The number of ship calls has been increasing in these three years, but the average ship size has decreased a little. That is because smaller ships have been introduced in some routes.

Figure 3.2.19 RoRo Ship's Call & Average GT

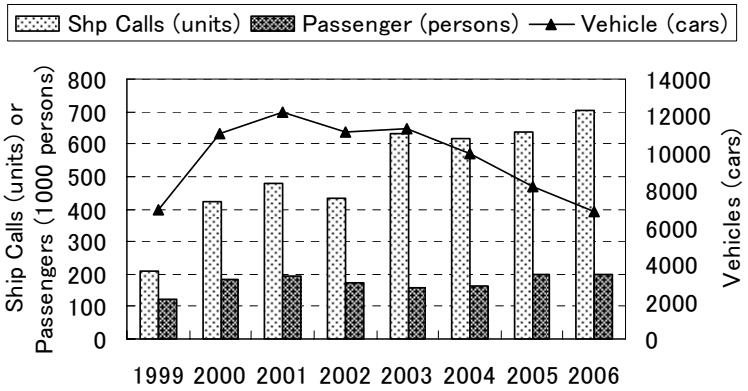


	2004	2005	2006
Number of Ships	651	818	884
Average GT by ship	5,790	5,700	5,389

Source: PELINDO III

Figure 3.2.20 and Table 3.2.8 shows the past trend of RoRo ship traffic of one shipping company. The number of ship call has been increasing a little while the arriving ships were 700 units more in 2006. The number of passenger traffic seems to be on a small up-trend with almost 200,000 persons in 2006. However, the number of cars has been decreasing since 2002.

Figure 3.2.20 RoRo Traffic (PT. DHARMA LAUTAN UTAMA)



Source: PT. DHARMA LAUTAN UTAMA

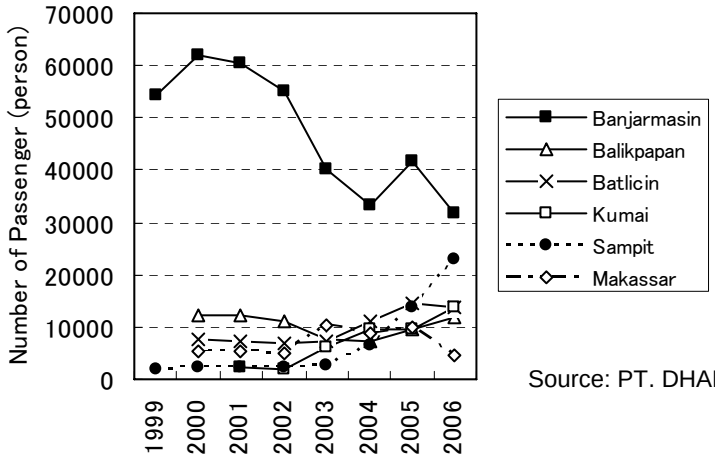
Table 3.2.9 RoRo Traffic (PT. DHARMA LAUTAN UTAMA)

Items	1999	2000	2001	2002	2003	2004	2005	2006
Shp Calls (units)	209	422	477	434	634	616	637	705
Passenger (persons)	121.179	181.674	193.303	175.729	157.766	161.345	198.431	197.113
Vehicle (cars)	6914	11026	12246	11133	11321	10004	8245	6837

Source: PT. DHARMA LAUTAN UTAMA

There are 12 routes of RoRo ship services from/to Surabaya operated by one shipping company. The passenger traffic to/from Banjarmasin is biggest among them, but its traffic has been drastically decreasing since 2000. On the contrary, the passenger traffic to/from Sampit, Kumai and Batulicin have been increasing favorably. The traffic to/from Balikpapan decreased a lot until 2004 and after that it has been recovering. (see Figure 3.2.21)

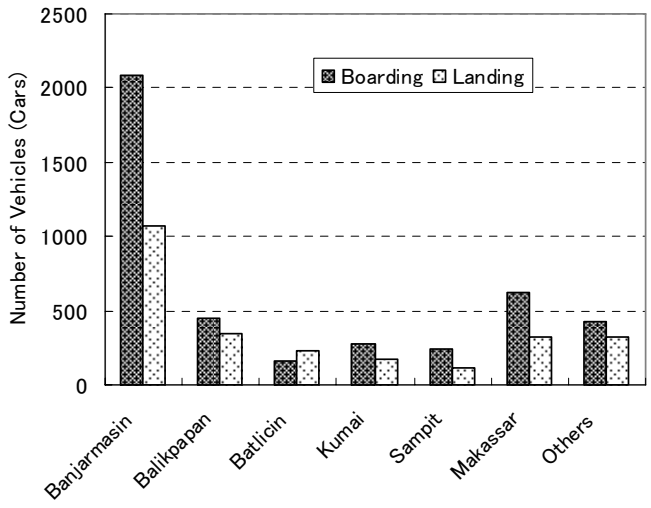
Figure 3.2.21 Passenger Traffic Changes by Direction (From Surabaya)



Source: PT. DHARMA LAUTAN

Figure 3.2.22 shows the number of cars carried by RoRo ships by one shipping company. The number of carried cars to/from Banjarmasin is more than 2000 for boarding and 1000 more for alighting in 2006. Strangely, boarding cars are more than landing cars to/from Banjarmasin.

Figure 3.2.22 Number of Cars Carried by RoRo Ships

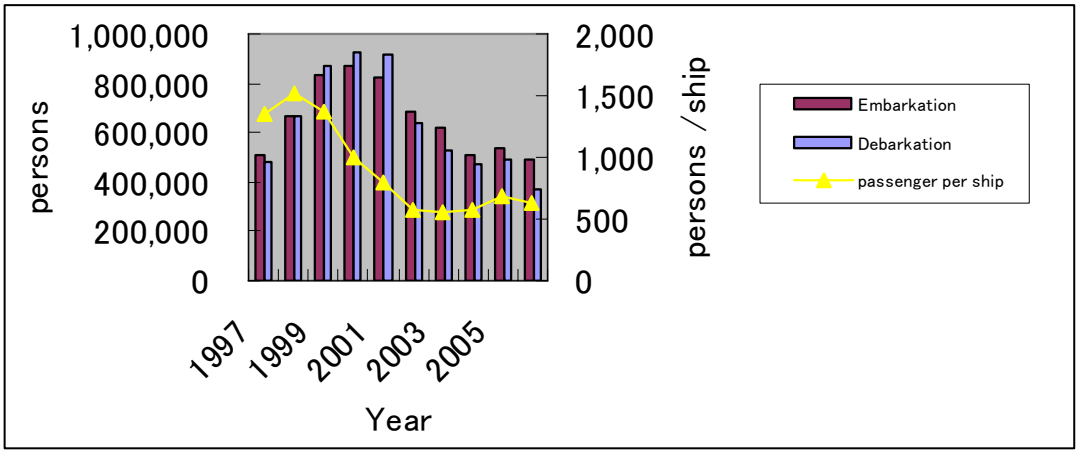


Source: PT. DHARMA LAUTAN

f. Passenger Traffic

Figure 3.1.23 shows the number of maritime passengers and average passengers on board a ship calling at Tanjung Perak (excluding ferry transport to Madura). After the volume of maritime passengers peaked in 2000, it has been decreasing year by year, though it has somewhat stabilized in recent years. The reason is said to be the strong competition coming from airline services. The number of the passenger throughput in 2006 was 863 thousands in 2006 which is less than half of throughput during the peak year. As personal income increases, people would tend to prefer much faster and more convenient modes transportation, which means that the number of passengers may continue to decrease or at least maintain its current ridership hereafter.

Figure 3.1.23 Number of Passengers and Passengers on Board a Ship (97-06)



Source: Tg. Perak Office, Pelindo III

3.3 Other Ports

1) Gresik Port

a. Port Overview

Gresik Port was opened in 1931 by the Netherlands Government, and its management was assigned to the Surabaya Regional Government. After that, it was transferred to PELINDO III based on the port regulation in 1996.

Gresik Port has been playing a significant role as a bulk cargo terminal. After the completion of the Curah quay, the handling of coals was transferred from Tanjung Perak to Gresik. A new quays for logs and unprocessed woods will be constructed adjacent to the coal terminal in the near future. Other quays are used for traditional local cargos and passengers to/from Bawean island. Table 3.3.1 outlines the public port facilities at Gresik Port.

Table 3.3.1 Public Port Facilities at Gresik Port

Name of Quay		Nusantara	Curah	Penumpang	Pelra	Talud Tegak
Commodities Handled		General cargo	Coal	Passenger, General cargo	General cargo	General cargo
Max Ship to Accommodate		3,200GT	3,500GT	320GT	280GT	2,500GT
Construction Year		1,992	1,999	2,002	2,002	1,994
Facility	Length	265	70	60	120	800
	Depth	-6	-4	-4	-4	-3
Type of Structure		Floor Concrete	Concrete Pile	Concrete Pile	Concrete Pile	
Yard Facilities		Warehouse 1400m2	Yard 22,710m^2			

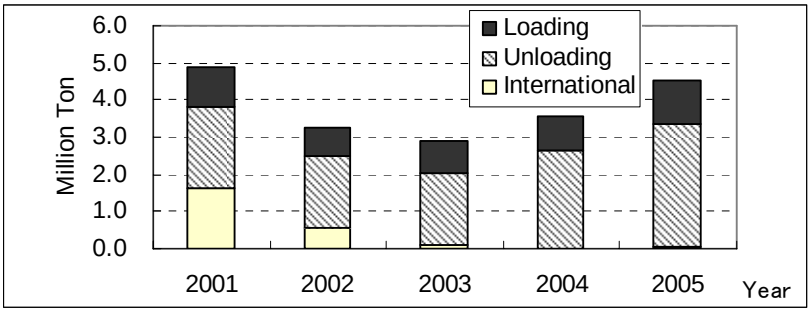
Source: Gresik Office, Pelindo III

b. Cargo Throughput

Cargo throughput at Gresik Port was more than 6 million tons before 1996. After that, it had been decreasing year by year, and was recorded at 3 million tons/year at its minimum in 2003 as illustrated in Figure 3.3.1. Then the port started to handle coal, and cargo throughput has been increasing rapidly. Figure 3.3.2 shows the throughput by cargo items. Half of the cargos are conventional freight, while the volume of coals is increasing and presently its share is almost 1/3. No international cargos are handled there at present.

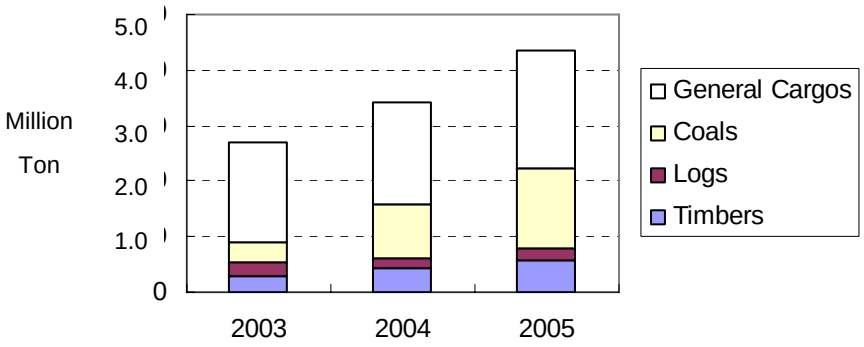
In Gresik Port there are several companies, some of them are state-owned companies, and some are private companies, that operate special use facilities at Gresik (i.e private berth). Figure 3.3.3 shows the cargo throughput at public and private berths, with the share of private berths at 42% in 2005.

Figure 3.3.1 Cargo Throughput at Gresik Port



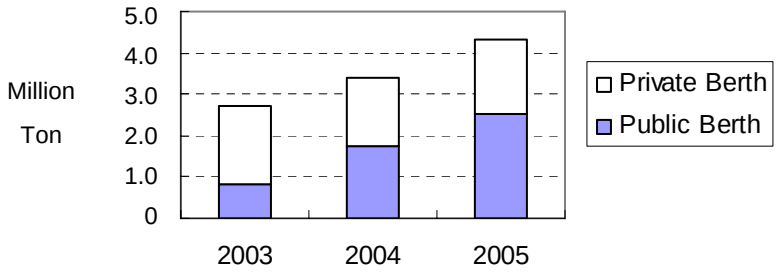
Source: Gresik Office, Pelindo III

Figure 3.3.2 Throughput by Cargo Items at Gresik



Source: Gresik Office, Pelindo III

Figure 3.3.3 Cargo Throughput at Public and Private Berths in Gresik

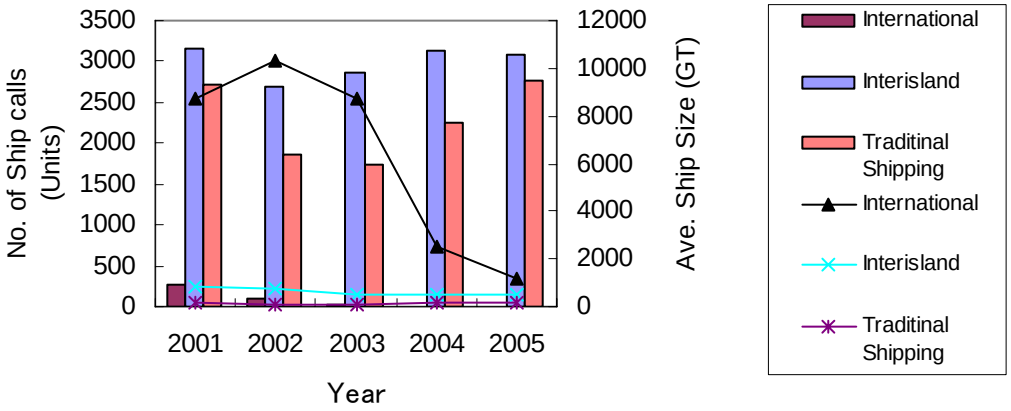


Source: Gresik Office, Pelindo III

c. Ship Calls

Figure 3.3.4 shows number of ship calls and average ship size at Gresik Port. Gresik Port was formerly used for the international trade, but nowadays it is for domestic use only. Moroever, a lot of traditional ships use the quay as their base port. The average calling ship sizes are 500GT on non-traditional interisland ships and 170GT for traditional ships.

Figure 3.3.4 Number of Ship Calls and Average Ship Size at Gresik Port

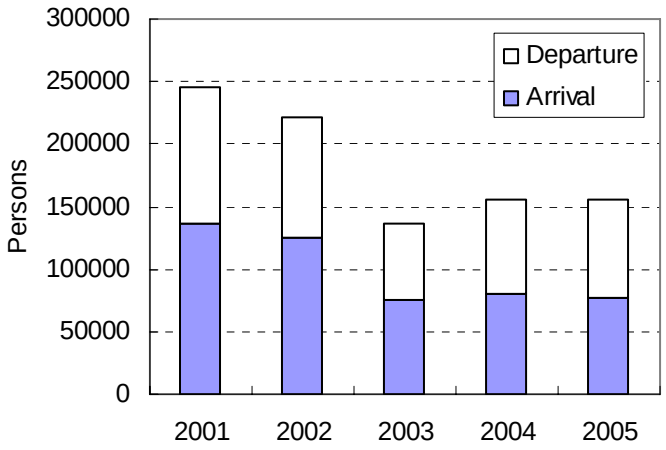


Source: Gresik Office, Pelindo III

d. Passenger Traffic

Figure 3.3.5 shows the number of passengers at Gresik Port. It is noted that the number of passengers had been decreasing to only 150 thousands persons by 2003.

Figure 3.3.5 Number of Passengers at Gresik Port



Source: Gresik Office, Pelindo III

2) Other Public Ports

In the Study Area, there are some other public ports and major ones includes, Port of Kamal which is a ferry terminal for the traffic between Surabaya and Madura, and another 2 public ports, Port of Telagabiru and Port of Sepulu.

a. Port of Telagabiru

Port of Telagabiru is located at the northern coast of Madura, about 60km from the Port of Kamal, and it is directly managed by DGST, MOT.

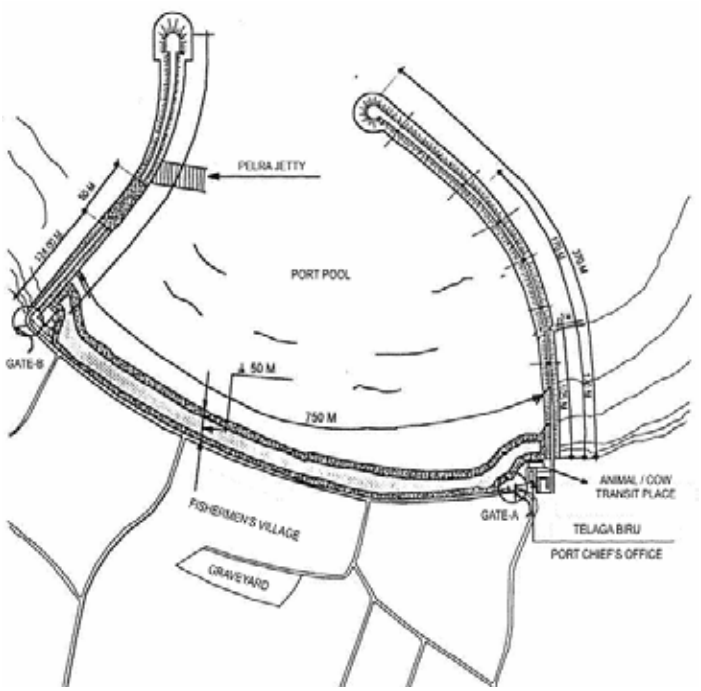
It has 2 breakwaters, made of crushed stone, on the left and right side for protection of the port basin. Its area is 145,000m^2 and its depth is 4m. There is a wharf (BxLxD=10x30x2.5m) at the left side of the basin. The warehouses are located along the coast and cows and sheep are stored there. The total area of the warehouses is 37,500m2. There are also a few government ships, floating equipment and a speed boat. (see Table 3.3.2)

Table 3.3.2 Facilities List of Telagabiru

Facility	Description
Office	Used building owned by PELINDO3, 388m^2
Breakwater	Total 5775m^3 in the east & west
Port Basin	Area 145,000m^2, Depth 4m
Wharf	30x10m, Depth 2.5m
Warehouse	37,500m^3
Others	Government ship /Floating equipment /Speed boat 1 unit

Source: Technical Plan, Institute Technology Sepuluh, 2002

Figure 3.3.6 Telagabiru Port



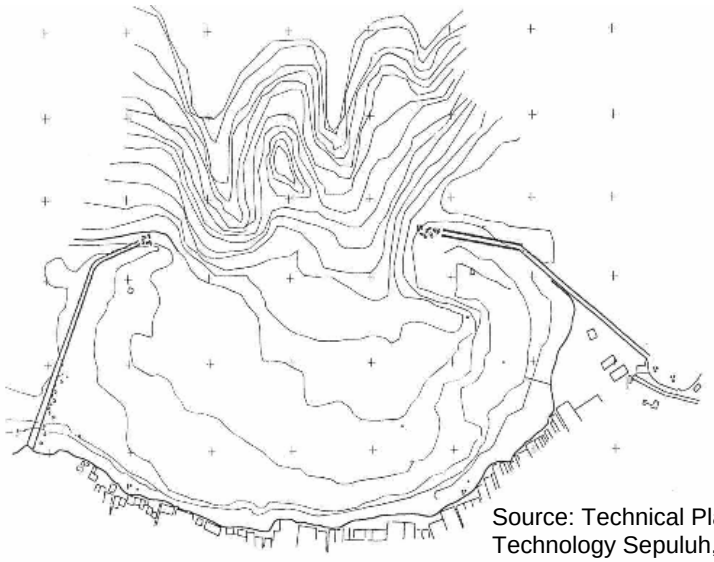
Source: Technical Plan, Institute Technology Sepuluh, 2002

b. Port of Sepulu

Port of Sepulu is located at the northern coast of Madura, about 10km to the west from the Port of Telaga Biru. The port was initially developed during the Dutch era. The Netherland government constructed a breakwater on the left side of the port basin. Presently, it is under the supervision by Telagabiru Port.

It has 2 breakwaters that make a port basin. Those breakwaters were made from crushed stone from highway works. This port has no wharf.and loading/unloading activity is done by small ships. There are some warehouses owned by private parties. They are used for the storage of wood from Kalimantan. There is likewise a dock which is owned by a local businessman. The dock is used for motor vessel with maximum 200m^3 capacity of wood.

Figure 3.3.7 Sepulu Port



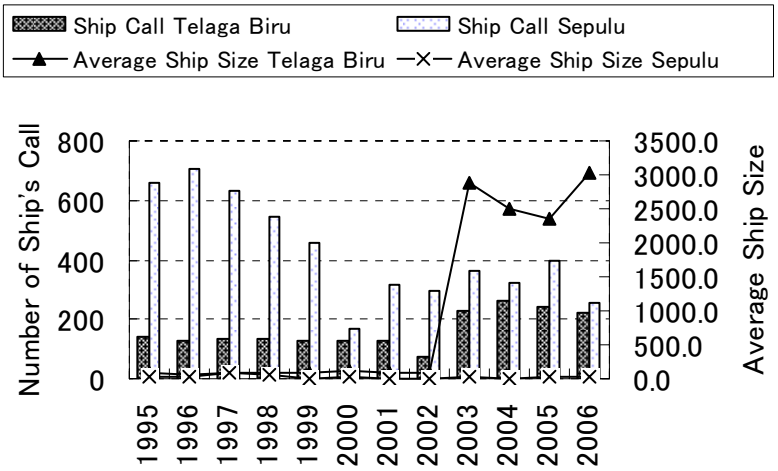
Source: Technical Plan, Institute Technology Sepuluh, 2002

c. Traffic characteristics of both ports

The number of ship calls at Sepulu is larger than that at Telagabiru, but the average ship size at Sepulu is much smaller than that of Telagabiru, most of them are small boats. The number of ship calls at Telagabiru jumped up at 2003. That was because an oil company, KODECO's tankers came in during that time. (see Figure 3.3.8)

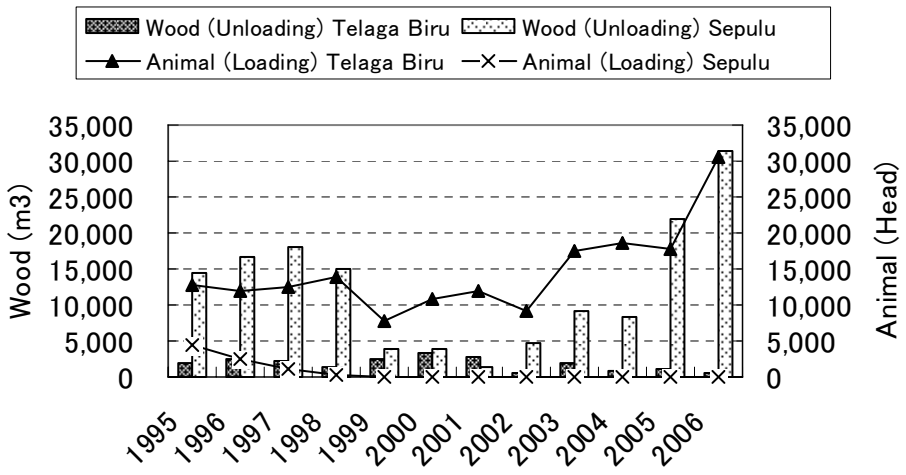
Considering the recent traffic trend, Telagabiru Port is said to be a base for animal and crude oil shipment. Cows and sheeps produced in Madura are carried out to Southern Sumatra and Kalimantan, while the incoming ships load wood from Kalimantan. The crude oil is produced at KODECO's oil terminal which is located 23 miles from Tenagabiru Port in the Java Sea. There is also a floating storage which consists of about 15 tankers and tanker sizes between 23,000 and 50,000 DWT. The statistics bel;ow hows just unloading volume, not loading one. Finally, Sepulu Port is said to handle raw woods from Kalimantan.

Figure 3.3.8 Ship's Call & Average Ship Size of Local Ports



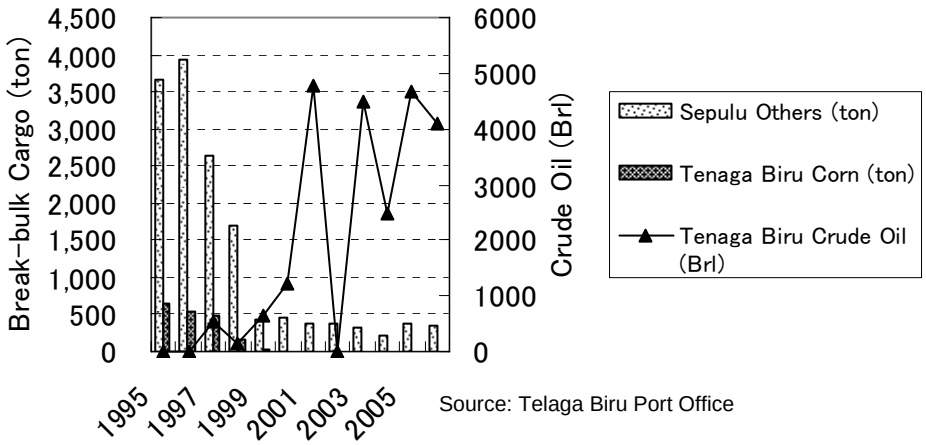
Source: Telaga Biru Port Office

Figure3.3.9 Handling Volume at Two Local Ports (No1)



Source: Telaga Biru Port Office

Figure 3.3.10 Handling Volume at Two Local Ports (No2)



Source: Telaga Biru Port Office

3) Private Ports and Jetties

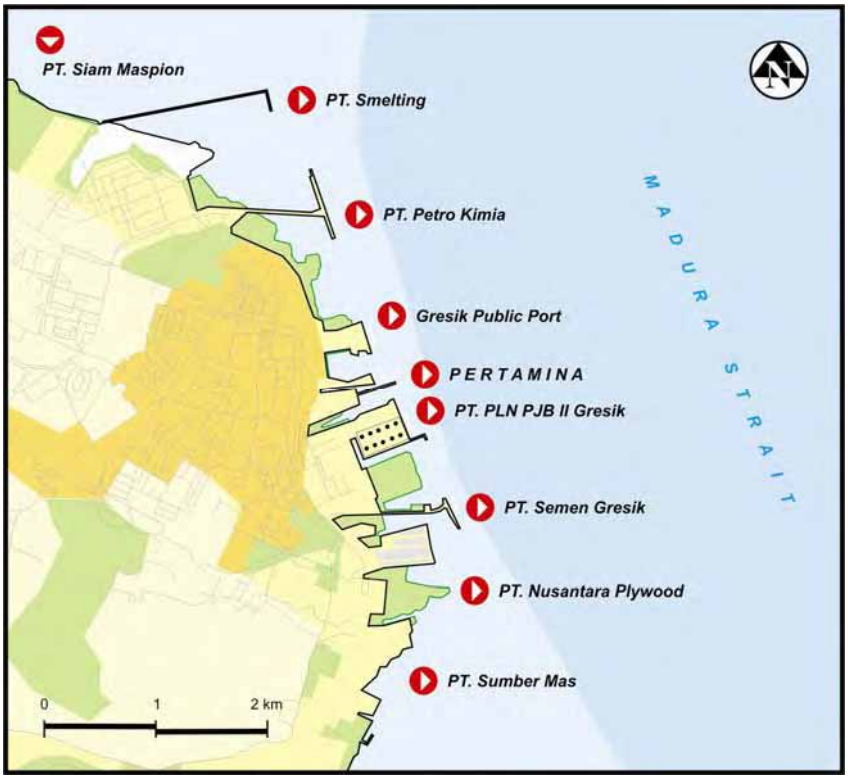
There are several exclusive use facilities in Surabaya Port Area, not only at Tanjung Perak Port as mentioned before, but also at Gresik Port. Table 3.3.3 details these facilities at Gresik Port. Based on the data of Gresik Port Office of PELINDO III, total cargo throughputs of these private facilities was 1.8 million tons in 2005.

Table 3.3.3 Private Facilities at Gresik Port

Company Name	Product	Facility				
		Length(m)	Depth(m)	Max Draft(m)	Type of Structure	Area Size(m2)
PT. SIAM MASPION TERMINAL	Chemical Industry	10x5	10		Trestle	
		4x8x8	10		Trestle	
		6x6x6	10	8	Trestle	
PT. SMELTING CO.	Iron & Copper	238x24	12	10	Trestle	
		1920x6	12	10	Trestle	
PT. PETROKIMIA GRESIK (PERSERO)	Fertilizer, Urea, Ammonia	285x25	14	12	Trestle	21,165
		390x36	14	12	Trestle	
PT. PERTAMINA ASPHALT	Asphalt Factory	40x38.7	9	7.5	Trestle	
		400x5	9	7.5	Trestle	
PT. PLN PJB II UP GRESIK	Power Electricity	50.3x30	8	7	Trestle	2,596.5
		59x15	8	7	Trestle	
		15x9	8	7	Trestle	
		15x9	8	7	Trestle	
PT. SEMEN GRESIK	Cement	289x13	9	9	Trestle	3,757
PT. INDONESIA MARINA SHIPYARD	Shipbuilding & Maintenance	Breakwater 352.52+140	12	10	Dry Dock	7,678
PT. NUSANTARA PLYWOOD	Plywood		0.5	Timber Pond		2,850

Source: Based on the hearing by the Study Team

Figure 3.3.11 Alignment of Private Jetties in Gresik



Source: Based on the hearing by the Study Team

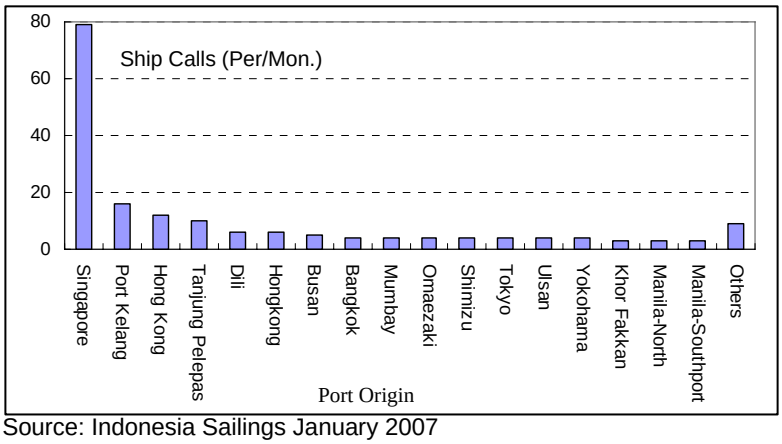
3.4 Existing Shipping Services

1) Overseas Shipping

Increasing container ship calls and diversifying trading ports. During the post-Economic Crisis period (1998 – 2005), container ship calls have doubled at Tanjung Perak, i.e., 2,075 ship calls in 1998 and 4,018 ship calls in 2005. During the same period, direct trading ports have been diversified from regional hub ports of Singapore and Hongkong.

As of January 2007, 180 container ship calls were reported. Taking account of their origin ports, Singapore (79 ship calls or dominantly 43.9%), Tanjung Pelepas (10 ship calls), Port Klang (16 ship calls) and Hongkong (18 ship calls) are regards as hub ports for Tanjung Perak. Beside those hub ports, Tanjung Perak received ship calls from other ports and countries directly without transferring to feedering services at the nearby hub ports already mentioned. They include Khor Fakkan (UAE), Mumbai (India), Bangkok (Thailand), Shanghai, Qindao and other mainland China ports, Busan and Ulsan (South Korea), Tokyo, Yokohama, Shimizu, Omaezaki and Hakata (Japan), Kaohsiung, Keelung (Taiwan) directly or dropping by Manila ports, New Zealand ports and Dili (Timor Leste). According to the voyage records compiled in DGST in 2005, the container ships calling at Tanjung Perak are relatively small feeder ships ranging from 14 TEU to 2,002 TEU and 341 TEU on the average.

Figure 3.4.1 International Container Shipping Calls



Source: Indonesia Sailings January 2007

Distribution of International Container at TPS. Table 3.4.1 shows the distribution of international container throughput at TPS. TPS only has “Port to Port Data” for imported container cargo, because a part of the cargo is consolidated at hub ports such as Singapore, Tanjung Pelepas and Hongkong. The share of imported container from Singapore is significantly higher than other ports. Moreover, 12.1% share of imported container is from Malaysia. Therefore, it seems that the imported container to/from TPS is served by feeder service.

On the other hand, for exported container cargo, TPS have an accurate export container cargo volume and true destination data. Export container volume is highest to Japan and United States. but, the ships directly callings to these countries are not so many, so it seems that export container also goes through hub ports such as Singapore, Tanjung Pelepas and Hongkong.

Table 3.4.1 Distribution of International Container Throughput at TPS

Import (Port of Loading)				Export (True Destination Port)			
No.	Name of Port	TEU/Year	Percentage	No.	Country	TEU/Year	Percentage
1	SINGAPORE	238,000	52.7%	1	JAPAN	62,000	13.0%
2	MALAYSIA	55,000	12.1%	2	UNITED STATES	59,000	12.2%
3	PHILIPPINES	35,000	7.7%	3	SINGAPORE	50,000	10.3%
4	PTP	27,000	5.9%	4	CHINA	47,000	9.7%
5	HONG KONG	22,000	4.9%	5	MALAYSIA	42,000	8.8%
6	TAIWAN	14,000	3.1%	6	KOREA	24,000	5.0%
7	KOREA	13,000	2.8%	7	HONG KONG	22,000	4.5%
8	WSP	11,000	2.4%	8	TAIWAN	20,000	4.1%
9	CHINA	10,000	2.1%	9	AUSTRALIA	17,000	3.5%
10	AUSTRALIA	5,000	1.0%	10	VIET NAM	11,000	2.4%
11	MJJ	4,000	1.0%	11	NETHERLAND	11,000	2.3%
12	SGP	4,000	0.9%	12	INDIA	10,000	2.1%
13	MNN	3,000	0.7%	13	GERMANY	9,000	1.9%
14	VIET NAM	2,000	0.5%	14	PHILIPPINES	8,000	1.7%
15	QIN	2,000	0.5%	15	BELGIUM	8,000	1.6%
16	HKN	2,000	0.4%	16	UK	8,000	1.6%
17	LYG	2,000	0.3%	17	THAILAND	6,000	1.3%
18	UNKNOWN	1,000	0.3%	18	CANADA	6,000	1.2%
19	JAPAN	1,000	0.2%	19	FRANCE	5,000	1.1%
20	YYT	1,000	0.1%	20	NEW ZEALAND	4,000	0.9%

Source: TPS in 2006

International Non-container Shipping Service. The following table shows the distribution of international non-container volume estimated using Tg.Perak throughput cargo volume by PELINDO III and the voyage record from DGST. For both exports and the imports, the share of Singapore is high; however, it is not exceptionally high compared to the case of international container. Meanwhile, non-container cargos are directly transported to/from Asian countries.

Table 3.4.2 Estimated Distribution of International Non-Container Throughput

Import				Export			
No.	Name of Port	000 Ton /Year	%	No.	Name of Port	000 Ton /Year	%
1	Singapore	474	13.3%	1	Singapore	171	19.6%
2	China	280	7.9%	2	Korea	116	13.3%
3	Philippines	258	7.2%	3	China	78	8.9%
4	Taiwan	256	7.2%	4	Hongkong	62	7.1%
5	Japan	229	6.4%	5	Kaohsiung, Taiwan	44	5.0%
6	Hongkong	215	6.0%	6	Vietnam	41	4.7%
7	Australia	196	5.5%	7	Tg. Pelepas, Malaysia	39	4.5%
8	Thailand	174	4.9%	8	Thailand	30	3.4%
9	Port Klang, Malaysia	166	4.7%	9	Japan	29	3.3%
10	Brazil	97	2.7%	10	Australia	17	1.9%
11	Argentina	94	2.6%	11	Philippines	5	0.6%
12	Korea	91	2.6%	12	Port Klang, Malaysia	1	0.1%
13	Amerika Serikat	72	2.0%	13	Others	0	0.0%
14	Malaysia	71	2.0%	Total		873	100.0%
15	Kandla	54	1.5%				
16	India	36	1.0%				
17	Vietnam	26	0.7%				
18	New Zealand	21	0.6%				
19	Tg. Pelepas, Malaysia	9	0.3%				
20	Others	744	20.9%				
Total		3561	100.0%				

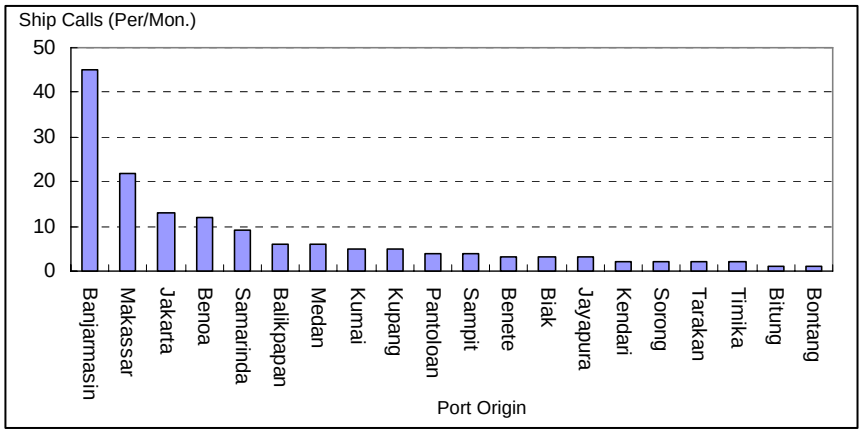
Source: Voyage Record DGST in 2005, PELINDO III Data in 2005

2) Domestic Cargo Shipping

Domestic container ship calls and network. As of January 2007, 150 domestic container ship calls were reported, with the following primary trading ports: (i) Banjarmasin (45 ship calls or dominantly 30.0%), (ii) Makassar (22 ship calls), (iii) Jakarta (13 ship calls) and (iv) Benoa (12 ship calls). The number of ship calls from Banjarmasin is significantly higher than that of other domestic routes.

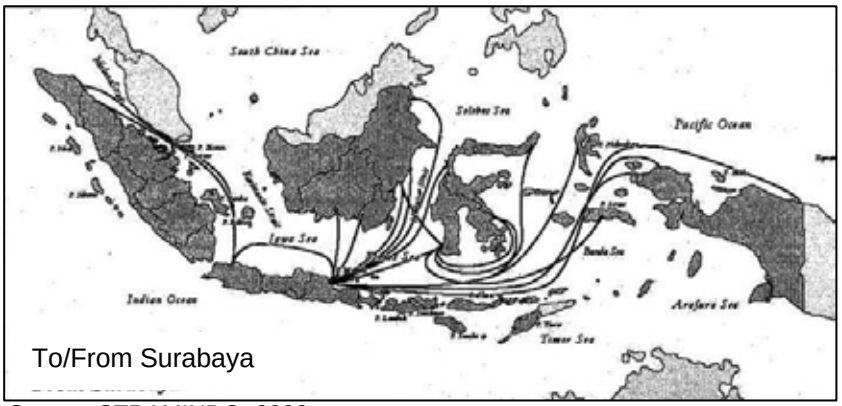
Figure 3.4.3 shows domestic container shipping network. The density of the network from Surabaya Port to Kalimantan island and Sulawesi island are substantial compared to other islands, demonstrating the influence of Surabaya port to East Indonesia. Furthermore, it seems that Surabaya port is the center of East Indonesia for domestic container movement.

Figure 3.4.2 Domestic Container Shipping Calls



Source: Indonesia Sailings January 2007

Figure 3.4.3 Domestic Container Shipping Network

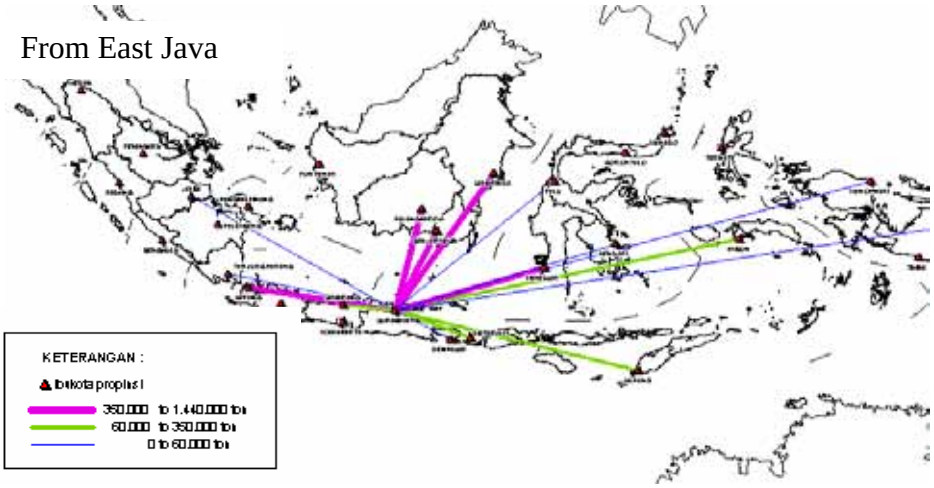


Source: STRAMINDO, 2002

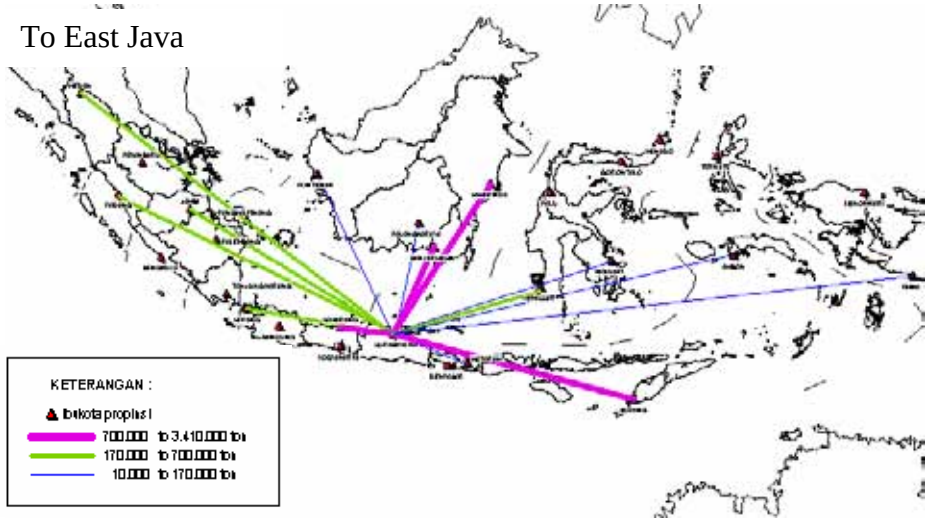
Domestic Cargo Distribution. Figure 3.4.4 illustrates domestic cargo distribution to/from East Java. Cargo volume from East Java (Loading) is remarkably high for routes going to DKI Jakarta and eastern Kalimantan, and South Sulawesi. On the other hand, the cargo volume to East Java (Unloading) is predominantly coming from eastern Kalimantan. In addition, they also have connection with Sumatra Island. Therefore, trip distance of inbound cargo volume is longer than that of outbound cargo volume.

Figure 3.4.4 Domestic Cargo Distribution to/from East Java

Destination	Cargo Volume (Ton)
Bali	30,000
DKI Jakarta	1,439,000
West Irian Jaya	11,000
East Irian Jaya	8,000
Jambi	1,000
Central Java	7,000
South Kalimantan	356,000
Central Kalimantan	637,000
East Kalimantan	1,389,000
Lampung	35,000
Maluku	231,000
West Nusa Tenggara	301,000
East Nusa Tenggara	151,000
South Sulawesi	352,000
Central Sulawesi	57,000
Sulawesi Tenggara	38,000
Total	5,104,000



Origin	Cargo Volume (Ton)
North Sumatera	414,000
West Sumatera	511,000
Jambi	434,000
DKI Jakarta	644,000
Central Java	904,000
West Nusa Tenggara	107,000
East Nusa Tenggara	729,000
West Kalimantan	166,000
Central Kalimantan	104,000
South Kalimantan	2,433,000
East Kalimantan	3,409,000
South Sulawesi	696,000
Central Sulawesi	500,000
Sulawesi Tenggara	31,000
North Sulawesi	46,000
Maluku	1,000
Central Irian Jaya	24,000
Total	11,166,000

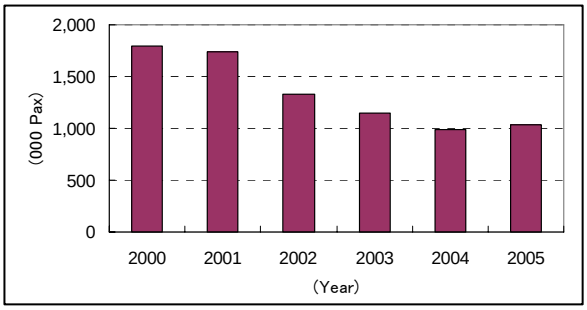


Source: STRAMINDO, 2002

3) Passenger and Other Shipping Services

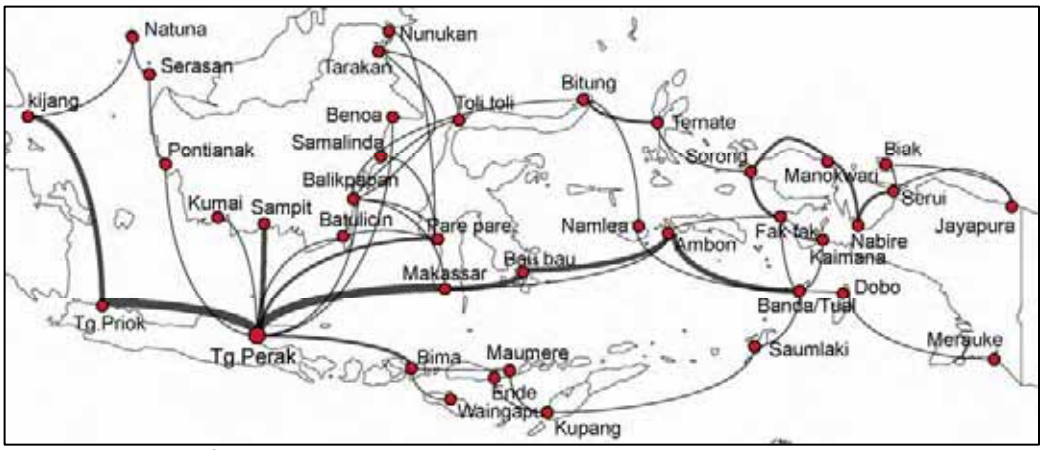
Passenger Shipping Service. Figure 3.4.5 shows the number of passenger to/from Tg.Perak between 2000 and 2005. There was a decrease in the last five years of around 30% and now, the passenger to/from Tg. Perak is 1,030 thousand in 2005. Figure 3.4.6 illustrates the inter-island ship route (e.g. PELNI) to/from Tg.Perak. Recently, although long trips are increasing, the airline companies are highly competitive providing fast and reasonable fare. Consequently, it seems that the share of shipping service for passenger is decreasing.

Figure 3.4.5 Passenger Distribution to/from Tg.Perak



Source: Tg.Perak Office, PELINDO III

Figure 3.4.6 Passenger Ship Route to/from Tg.Perak



Source: JICA Study Team

RoRo Shipping Service. Table 3.4.3 features the RoRo shipping service to/from Tg.Perak of the two existing operators for RoRo at Tg.Perak. Almost all RoRo shipping services are to/from Kalimantan island such as Banjarmasin, Balikpapan and etc., while others are to/from Maumere in Flores island. RoRo shipping service is characterized by relatively short distance routes compared to other shipping service types.

According to the interview on a RoRo shipping company, the number of passenger and number of vehicles which use RoRo services have been decreasing during the past 10 years. Even though the travel time of RoRo shipping service is shorter than other shipping services, the fare of RoRo shipping service is a little bit expensive, resulting in decreased patronage.

Table 3.4.3 RoRo Shipping Service to/from Tg. Perak

Operator	Route	Frequency (Per Mon.)	No. of Vehicle (Car/Mon.)	
			To Tg.Perak	From Tg.Perak
PT.DHARMA LAUTAN UTAMA	Banjarmasin	13	371	562
	Balikpapan	5	103	206
	Makasar	5	89	154
	Sampit	3	77	88
	Batulicin	3	49	100
	Kumai	4	59	88
	Maumere	3	79	174
PT.PRIMA VISTA	Banjarmasin	10	167	270
	Balikpapan	11	325	540
	Maumere	3	93	156
Total		60	1,412	2,338

Source: PELINDO III Tg. Perak Branch, Jan. 2007

4 EXSITING ACCESSIBILITY TO PORTS

4.1 Existing Access Channels, Anchorages and Basins

1) Surabaya Access Channels, Anchorages and Basins

The Surabaya Access Channels consist of “the West Channel” and “the East Channel” and are parts of the Madura Strait. The West Channel is the access to/from the Java Sea for the port while the East Channel is the access to the Bali Sea. At the center of the Strait, are the ports of Tg. Perak and Gresik.

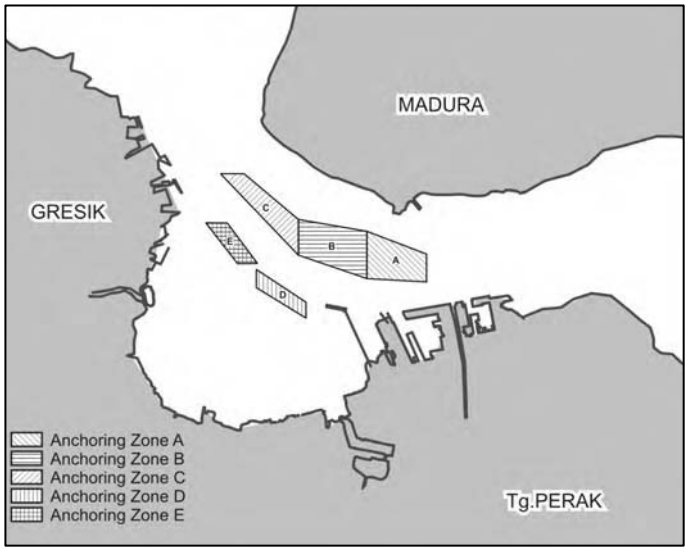
a. Surabaya West Channel

The Surabaya West Channel starts at Buoy No. 5 with a water depth of about 12m, orienting at the direction of 215° -035° . At the 2,000m point, there is Buoy No. 2 and the channel turns towards the direction of 020° -200° . At 11,800m the channel again bends as marked by Buoy No. 11. After passing Buoy No. 6 at the 16,300m point the channel resumes with a depth of about 15m. This portion of the West Channel constitutes the primary access to the port, which has a normal water depth of about 9.5m and a width of about 50m only. Hence, maintenance dredging is programmed for this portion to a depth of 10.5m with a width of 100m. In order to protect the channel from siltation, a training wall was constructed on the eastern side of the channel during the Dutch colonial time from Ujung Piring to Pulau Karang Jamuang, i.e. Pilot Station, which has a total length of about 13km.

b. Central Portion of Channel and Anchorages

After passing Buoy No. 6, the channel enters into a narrow deep area surrounded by Tg, Sawo on the Java Island and Tg. Slempit and Tg. Bulu on Madura Island. Then, the channel becomes relatively wide and deep becoming the anchorage areas of Gresik and Tg. Perak Ports. At the bend in front of Gresik and Lamong, the water depth is greater than 20m. There are five anchoring zones located on the northern side of the access channel in Tanjung Perak Port with designations as shown in Figure 4.1.1. Zone A is available for ships of length overall (LOA), less than 100m; Zone B is for ships of LOA between 100m and 151m, and Zone C, D and E are for barges.

Figure 4.1.1 Anchorage Areas in Gresik and Tg. Perak Ports



Source: Pelimdo III

c. Surabaya East Channel

To the east of Tg. Perak Port the water area has a gradually wide width like a horn aperture, entering into the Bali Sea; however, the natural water depth is shallow. The deep portion of the channel is separated into three branches, The northern branch is blocked by a prohibited area where mines were once planted and the southern route is short near the beach of Surabaya City. Thus, only the central branch constitutes the Surabaya East Channel. The East Channel has a natural water depth of about 3m below CDL. Maintenance dredging has not been programmed in the East Channel, hence, only small ships can take the East Channel route.

2) Management, Operations and Maintenance of Access Channels and Basins

a. Management of Access Channels, Anchorages and Basins

The water area of the Access Channel is in the Port Interest Area (DLKP) and is managed by the Harbor Master in Administrator Pelabuhan Tg. Perak (ADPEL Tg. Perak) under DGST. ADPEL collects “Navigation Charge” from all the ships entering the port amounting to US$ 0.027/GRT for foreign ships, Rp. 220/GRT for domestic ships, and Rp.100/GRT for rakyats or traditional ships). The collected charge is transferred to the central government, or the Ministry of Finance, every week.

The anchorage is located in the Port Working Area (DLKR) and is managed by Pelindo III. Pelindo III charges “Port Entry Charge” to all the ships entering the port at a rate of US$0.084/GRT/call. Official procedures for a ship to enter/leave a port are under the management of ADPEL, while berth assignment is conducted by Pelindo which charges “Dockage Charge.”

b. Ship Operations at the West Channel

The ship operations at the West Channel are practically controlled as follow:

i) Pilotage is compulsory for ships larger than 500 GRT. A pilot commonly embarks a ship, for an arriving ship, at the Pilot Station and disembarks at the pier, and, for a leaving ship, embarks at the pier and disembarks the ship at Buoy No. 5, as far as it is possible. “Pilotage Fee” is charged by Pelindo.

ii) The right to enter and pass the West Access Channel is given to the ship that arrived first, based on the principle of “First Come –First Service.” The ship that arrived later shall wait until the former ship passes through the channel. Exception is small ships which can enter the channel even if a large ship is passing the channel. The distance between the passing ships shall be larger than 100m.

iii) Large ships which have drafts deeper than 8m shall not pass or cross each other in the West Access Channel.

iv) In the channel, ship navigation speed is maintained at less than 8 knots.

c. Maintenance of Access Channels and Basins

According to the Dredging Plan of Pelindo III, the access channel is scheduled to be maintained by regular dredging as shown in Table 4.1.1. The West Access Channel is to be dredged to a depth of 10m every 4 years by the Government. It is, however, actually dredged by Pelindo III, utilizing the dividends of Pelindo III allotted to the government.

Table 4.1.1 Maintenance Plan of Channels and Basins by Pelindo III

Facility	Depth (m)	Volume (m^3)	Interval (year)	Remarks
1. West Access Channel	10.0	750,000	Once 4 years	By the Government
2. Tg. Perak Basins	6.0 -10.0	300,000	Every year	By Pelindo III
3. Kalimas North	3.0-3.5	100,000	Once 2 years	Ditto
Kalimas South	2.0-3.0	100,000	Ditto	Ditto
4. Gresik Pelra Wharf Basin	5.0	100,000	Ditto	Ditto
Gresik Nusantara Wharf	6.0	100,000	Ditto	Ditto

Source: Pelimdo III

In the past the maintenance dredging at the West Access Channel was carried out in 1997, 2002, and 2005. The records of maintenance dredging before 1997 are not available. The dredged volume in 2005 was 687,000 m^3 according to "the Dredging Report" of Pelindo III. For reference, the list of available navigation charts and bathymetric maps is presented in Table 4.1.2, Table 4.1.3, and Table 4.1.4.

Table 4.1.2 List of Navigation Chart and Bathymetric Maps at Surabaya West Access Channel (1)

Location	Publisher	Data Type	No.	Version	Scale	Time Surveyed	Survey Area (Spot No.)	Minimum Depth (m)	Remarks
Surabaya Approach Channel (West and East)	The Navy	Navigation Charts	70	9th	1/500,000	Sept 2005	All East Jawa	-	-
			82	8th	1/200,000	Mar 2006	Surabaya and Madura	-	-
			96	8th	1/75,000	Dec 2004	West and East Channels	-	-
			84	5th	1/12,500	Dec 2004	Tg. Perak and Gresik	-	Incl. Lamong Bay.
	USA	Navigation Charts	72231	8th	1/75,000	-	Port of Surabaya and Approaches	-	From Indonesian and British Admiralty charts to 1996.
			72234	2nd	1/12,508	-	Pelabuhan Surabaya and Gresik	-	
	United Kingdom	Navigation Charts	975	1st	1/80,000	-	Approaches to Surabaya	-	Edition Date:20th Jan. 2005. This Chart and No.96 of the Navy are the same almost.
			921	4th	1/15,000	-	Pelabuhan Surabaya and Approaches	-	Edition Date:24th Nov. 2005. This Chart and No.84 of the Navy are the same almost.
Surabaya West Approach Channel	Pelindo III	Bathymetric Charts	-	-	1/2,500	09 Sep. 1987 - 13 Nov. 1987	0 – 3,500	9.7	Data collection Inner Channel
							3,500 – 7,000	9.8	
							7,000 – 10,500	11.8	
							10,500 – 14,000	10.2	

Source: JICA Study Team

Table 4.1.3 List of Navigation Chart and Bathymetric Maps at Surabaya West Access Channel (2)

Location	Publisher	Data Type	No.	Version	Scale	Time Surveyed	Survey Area (Spot No.)	Minimum Depth (m)	Remarks
Surabaya West Approach Channel	Pelindo III	Bathymetric Charts	-	-	1/2,500	25 Oct. 1988 - 20 Nov. 1988	0 – 4,000	8.0	Data collection The corner: 8.4m Outer Channel
							4,000 – 8,000	8.6	
							8,000 – 12,000	9.4	
							12,000 – 16,000	9.6	
			-	-	1/2,500	11 Sep. 1990 - 10 Oct. 1990	0 – 4,000	7.4	Data collection The corner: 9.9m Outer Channel
							4,000 – 8,000	8.6	
							8,000 – 12,000	8.7	
							12,000 – 16,000	8.9	
			-	-	1/2,500	Sep. 1995	0 – 4,000	8.4	Data collection The corner: 6.5m Outer Channel
							4,000 – 8,000	8.2	
							8,000 – 12,000	6.5	
			-	-	1/2,500	8 May 1996 - 1 June 1996	0 – 4,000	7.0	Before dredging The corner: 10.2m Outer Channel
							4,000 – 8,000	8.1	
							8,000 – 12,000	10.0	
							12,000 – 16,000	10.1	
			-	-	1/2,500	Jan. 2002 - Jan. /2002	0 – 4,000	8.0	Before dredging The corner: 9.5 m. Outer Channel
							4,000 – 8,000	9.2	
							8,000 – 12,000	9.7	
							12,000 – 16,000	9.3	

Source: JICA Study Team

Table 4.1.4 List of Navigation Chart and Bathymetric Maps at Surabaya West Access Channel (3)

Location	Publisher	Data Type	No.	Version	Scale	Time Surveyed	Survey Area (Spot No.)	Minimum Depth (m)	Remarks
Surabaya West Approach Channel	Pelindo III	Bathymetric Charts	-	-	1/2,500	05 Apr. 2002 - 16 Apr. 2002	0 – 4,000	10.1	After dredging The corner: 10.3 m. Outer Channel
							4,000 – 8,000	10.2	
							8,000 – 12,000	10.0	
							12,000 – 16,000	10.1	
			-	-	1/2,500	29 Aug. 2005 - 7 Sep. 2005	0 - 2,600	9.3	Before dredging The corner: 9.3 m Outer Channel
							2,600 – 6,000	9.7	
							6,000 – 9,000	9.9	
							9,000 – 11,900	9.5	
							12,000 – 15,000	10.0	
			-	-	1/2,500	14 Feb. 2006 - 23 Feb. 2006	0 - 2,600	10.5	After Dredging The corner: 10.8 m Outer Channel
							2,600 – 5,900	10.5	
							6,000 – 9,500	11.0	
							9,600 – 12,400	10.7	
							12,500 – 15,700	10.5	
Tg. Bulupandan	Univ. Gadlah Mada	A3-size Drawing	-	-	5.9/100,000	2004	Tg. Modung –Tg. Bulupandan	-	For East Jawa Province.

Source: JICA Study Team

3) Navigation Aids in Access Channels and Harbor Areas

a. Arranged Navigation Aids

The navigation aids (Nav, Aids) in and around the Access Channel and Anchorages are summarized in Table 4.1.3, which are all maintained by the government through the District of Navigation Surabaya under DGST. They are divided into four kinds, i.e. two light houses, 24 light buoys, 13 unlighted buoys, and 13 light beacons. These Nav.Aids are playing a vital role to assist safety navigation of ships in the port.

b. Maintenance of Navigation Aids

The light buoys are all equipped with solar battery systems.The buoys are maintained regularly at intervals of three months; however, it is said that there are no extra buoys for stocking and spares. There are other minor navigation aids such as caution buys showing the submarine cables of PT. PLN. At this moment, there is no Vessel Traffic Management System (VTS) equipped with radar in Surabaya Port.

4) Obstacles and Prohibited Areas in Access Channels and Anchorages

a. Sunken Ships

On the navigation chart, there are 14 wrecks and 5 obstructions along the West Access Channel. Additionally, there are 24 wrecks and obstacles at the anchorages in front of Jamrud Wharf and TPS Pier of Tg. Perak Port.

b. Submerged Pipeline and Power Cables

There are some red-letter infrastructure buried under the seabed The one is the gas pipeline laid along the channel on its west side from the Java Sea to the Power Station at Gresik. A strip covering the pipeline is designated as the prohibited area, forming the substantial limit of port facilities on the west bank of the Madura Strait.

The other is the 150,000-volt electric power cables crossing the channel at Gresik from PLN Wharf to Tanjung Tanjungan on Madura Island. There are three cables, one of which was abandoned after the cut-off accident in 1997. Two lines are now operational, which constitute vital lifelines for the people of Madura. Their coordinates are (7° 9' 57"S, 112° 40'12"E) and (7° 9' 36"S, 112° 40'53"E). A belt of 800m to 1,130m wide crossing the channel in which the cables are laid is designated to be no anchoring area, which are indicated by yellow caution buoys.

It is agreed among the parties concerned that this anchor-prohibited area for protection of the power cables is to be patrolled by the patrol boats of the Harbor Master three times a day as agreed in "Safety Procedure (PROTAP) for Submarine Cable 150,000 Volt between Jawa - Madura" dated 18 May 2006.

c. Other Obstacle

An important natural obstacle in the West Channel is an invisible shoal of hard seabed material with a depth of only 4.7m (surrounding water has 12m-depth) located in front of PT Smelting Pier. There is no marker buoy on the spot.

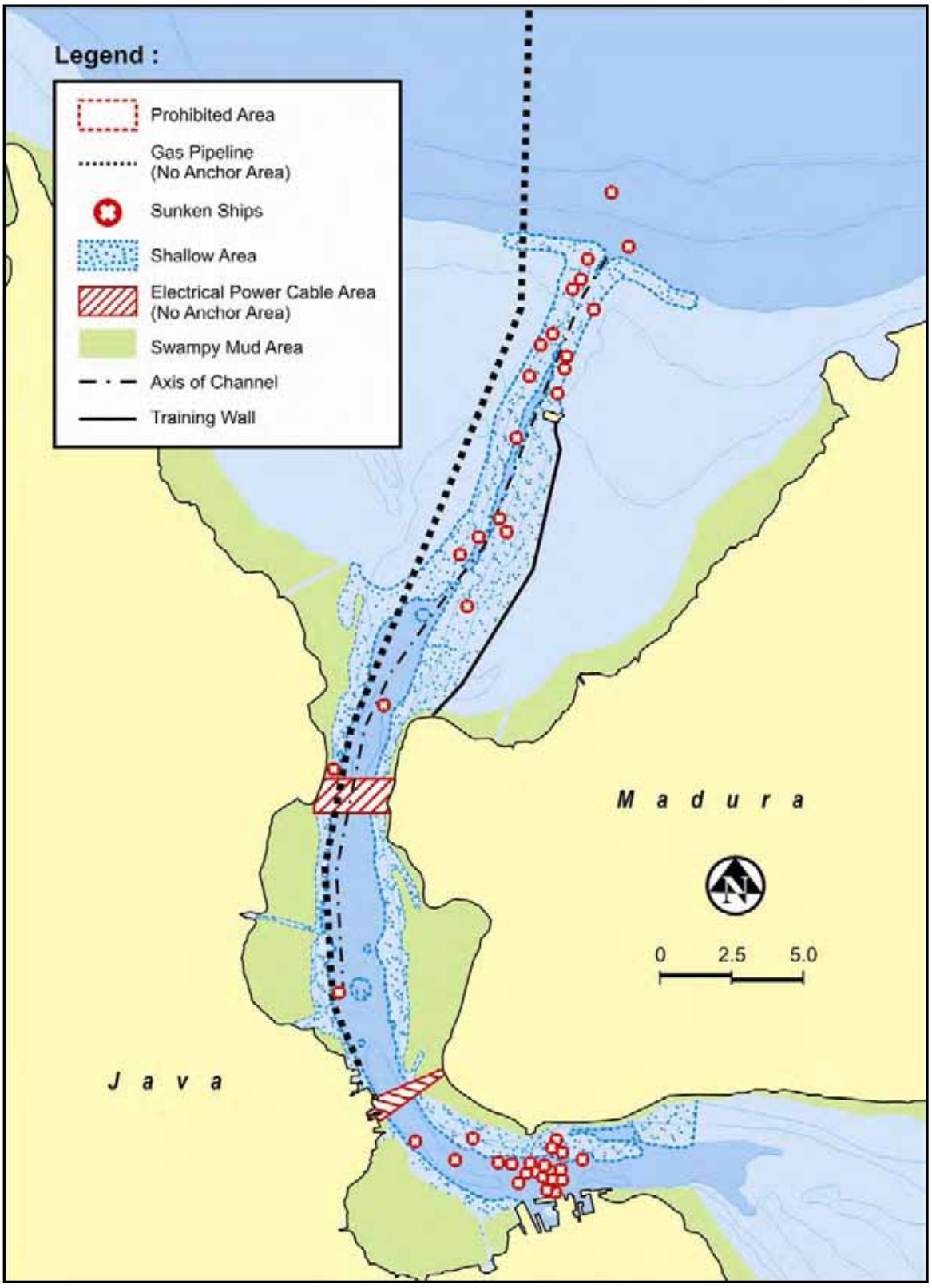
The above-mentioned obstacles are illustrated in Figure 4.1.2.

Table 4.1.5 List of Navigation Aids Arranged at Madura Strait

No	Name	Co-ordinate (Degree-Minute-Second)		Color	Elev. (m)	Light (NM)	Year Built	Loca- tion
1.	Light House							
1	Karang Jamuang	06-55-35S	112-43-42E	White	41	20	1970	Pilot St.
2	Sembilangan	07-03-30S	112-40-30E	White	53	20	1879	Bangkaln
2.	Light Buoy							
1	MPMT	06-45-00S	112-44-00E	White	6	6	-	West Ch.
2	No.1	06-46-30S	112-44-10E	Green	6	6	-	
3	Pelsu. No 1	06-46-06S	112-42-50E	Yellow	3	5	1995	
4	No.3	06-49-31S	112-44-32E	Green	6	4	-	
5	Pelsu. No.2	06-49-53S	112-43-23E	Yellow	3	3	-	
6	No.5	06-52-38S	112-44-40E	Green	6	6	-	
7	No.2	06-53-20S	112-44-20E	Red	6	6	-	
8	Pelsu. No.3	06-53-13S	112-43-16E	Yellow	3	3	-	
9	No.7	06-54-8.5S	112-43-46E	Green	6	6	-	
10	No.4	06-57-50S	112-42-30E	Red	6	6	-	
11	Pelsu. No.4	06-57-51S	112-41-25.4E	Yellow	3	5	-	
12	No.9	06-57-45S	112-42-23E	Green	6	6	-	
13	No.11	06-58-22S	112-42-08E	Green	6	6	-	
14	No.6	07-00-15S	112-41-00E	Red	6	6	-	
15	No.15	07-05-07S	112-39-10E	Green	6	6	-	
16	No.13	07-02-08S	112-39-47E	Green	6	6	-	
17	Pelsu. No.5	07-03-38S	112-39-30E	Yellow	3	3	-	
18	No.8	07-07-46S	112-39-36E	Red	6	6	-	
19	No.10	07-10-52S	112-41-19E	Red	6	6	-	
20	Typison	07-10-30S	112-40-50E	Green	6	6	-	
21	No.12	07-11-20S	112-42-48E	Red	6	6	-	
22	Kamal	07-11-04S	112-43-40E	Red	6	6	-	Tg. Perak
23	Kawitan	07-11-38S	112-43-29E		6	6	-	
24	MPMT	07-11-04S	112-43-40E	Red	6	6	-	East Ch.
3	Unlighted Buoy							
1	Green	06-52-42S	112-44-21E	Green				West Ch.
2	Gr. Budi Mumi	06-52-14S	112-44-35E	Green				
3	Kamal	07-11-09S	112-43-28E					Kamal Water
4	Kamal	07-11-06S	112-43-40E					
No	Name	Location (Degree-Minute-Second)		Color	Elev. (m)	Light (NM)	Year Built	Notes
5	No.1	07-23-35S	112-57-15E					East Ch.
6	No.2	07-21-22S	112-35-12E					
7	No.3	07-19-08S	112-53-20E					
8	No.4	07-15-50S	112-50-01E					
9	No.5	07-14-35S	112-51-45E					
10	No.6	07-13-25S	112-50-35E					
11	No.7	07-15-15S	112-45-59E					
12	No.8	07-11-27S	112-48-07E					
13	HMMD	07-12-14S	112-43-44E					Mirah Port
4.	Light Beacon							
1	Ug.Pangka	06-50-28.4S	112-32-49.4E	White	33	16	1997	Jawa S.
2	Maphia	06-59-18S	112-42-00E	White	11	8	1997	West Ch.
3	Ug. Piring	07-22-00S	112-41-00E	White	14	7	1974	Bangkalan
4	Kuning No.6	07-08-26.8S	112-39-16.8E	Yellow	7	5	1993	Gresik
5	Kuning N0.7	07-08-33.5S	112-39-21.1E	Yellow	7	5	1993	
6	Kuning No.8	07-08-48.8S	112-39-26.4E	Yellow	7	5	1993	
7	Pisang	07-11-11S	112-41-14E	Green	12	10	2003	West Ch.
8	Ujung	07-11-48S	112-44-20E	Red	9	4	1982	Lantamal
9	Queen Olga	07-10-52S	112-43-52E	Red	11	7	-	Kamal
10	Kesek	07-09-44S	112-45-57.5E	White	23	10	1983	Komplek
11	Sirumpa	07-24-32S	113-04-11E	White	13	10	-	East Madura Strait
12	Karang Koko	07-28-18S	113-07-00E	White	13	12	1985	
13	Manila	07-21-36S	113-10-11E	White	12	10	1998	

Source: District Navigasi Kelas Surabaya

Figure 4.1.2 Existing Obstacles against Seaborne Traffic at Madura Strait



5) Accidents in Access Channels

The Surabaya West Access Channel is considered as one of the most dangerous places for ships, because of its narrow and shallow channel dimensions and other obstacles. The most critical black spot is the entrance of the Channel, or the segment between Buoys No. 5 and No.7. Maritime accidents which took place in the Access Channel, Gresik and Tg. Perak ports are summarized in Table 4.1.4. The most frequent accidents are brushing and crashing between two ships. Running aground happened sometimes.

Another critical aspect is the submarine cables. The PLN power cables have been cut off by anchors of drifting ships 10 times since their installation in 1987 (see Table 4.1.5). The most serious incident occurred in February 1999, when both of the two submarine cables were cut by a container ship named "Kota Indah," resulting in a complete black out of Madura Island for almost four (4) months. It is planned that the new cable lines will be laid on the Suramadu Bridge, which is expected to be operational in 2009. The existing cable lines, however, will be continually used as maintenance circuits, even after the new lines on the Bridge will start to operate

Table 4.1.6 Record of Maritime Accidents in Surabaya Port

No.	Name of Ship	Loa (m)	Year	Situation
1	MT Bruce Savarino	158	1979	Ran aground between Buoy No 7 and Buoy No. 2. Foggy weather:.
2	MV Ned Lloyd	170	1987	Ran aground nearby Buoy No 8.
3	MV Banones	165	1999	Banones ship's prow brushed against MV Ganda Satria.
4	MV Bogasari V	200	2000	Bogasari Nilam brushed against two pilot boats.
5	MV Challenger	165	2000	The ship was out of control and brushed against Neptunus Ship.
6	MT Banda Sea	175	2000	The ship brushed against Buoy No. 2 while entering outer gate.
7	MT Clarice	121	2000	The ship brushed against MT Bali Hua that anchored in Gospear.
8	MT Clarity	174	2000	The ship brushed Buoy No. 5.
9	Caraka Jaya Niaga III-7	98	2000	Wharf position is against current, it caused the ship toss aside.
10	Asian Oil I	81	2001	Leaving Berlian wharf, Asian Oil's right prow brushed against the next ship's prow.
11	MV Atlantic	168	2001	It caught on Buoy No. 2 and dragged it along anchoring area "Tanjung Perak".
12	KM Permai III	132	2002	Crashed TK Rima Mega 27 in Anchor Buoy " Surabaya".
13	Perdana	107	2002	While anchoring, crashed KM Fudi.
14	MV Uni Chart	153	2003	The ship crashed KM Mandiri Nusantara in front of Petro Kimia Gresik wharf.
15	KM Pangrango and KM Seiko	74	2003	KM Paranggo leaving the wharf without anchor guide, it crashed KM Seiko that anchored near by.
16	MT Panca Samudra and MT Apal	176	2003	Both ships entering the wharf at the same time and crashed with each other.
17	Wan Hai 263	198	2004	Ran aground nearby Buoy No. 7.
18	MT Madina and MT MR I	170	2005	Crashed nearby Buoy No. 4 at 12.20 am.
19	MV Jubire Glory	211	2005	While mooring in TPS, right prow brushed against crane.
20	MV. Peach Mountain and MV. Uni Premier	195	2006	MV Peach Mountain crashed MV Uni Premier between Palkah 4 and Palkah 5.

Source: Pelindo III Tg. Perak Branch Office Commercial Department
Note: MT: Motor Tanker, MV (KM): Motor Vessel, TK: Barge

Table 4.1.7 Record of Accidents of PLN Submarine Cables

Cable No.	Date of Accident	Cause and Conditions	Date of Recovery	Remarks
No.1 150 kV, 120 MVA	2/12/94	Steel Pile contacted and damaged the cable	94	Started operation on 2/12/87
	19/2/99	Cut by anchor of container ship "Kota Indah"	10/6/99	All the two cables were cut to Madura Island
	3/8/99	Cut by anchor of tug boat "Anoman VII"	8/99	
	24/4/02	Damaged by anchor of Dredger owned by PJB	2/12/02	
	18/2/05	Ditto	4/10/05	
No.2 150 kV, 120 MVA	10/6/94	Cut by anchor of "Ocean Competence"	15/10/96	Started operation on 3/6/87
	19/2/99	Cut by anchor of "Kota Indah"	29/4/99	Cut simult. with No.1
	30/11/05	Cut by anchor of barge "Taurus"	19/5/06	
No.3 150 kV, 120 MVA	7/10/96	Cut by anchor of "Festivity"	25/7/97	Started operation on 25/6/97
	30/11/05	Cut by anchor of "Bali Sea"	-	Could not be repaired

Source: PT PLN

4.2 Existing Land Access Transport

1) Distribution Patterns

In order to understand the existing condition of land access transport, a truck driver interview survey and a truck count survey in Tg. Perak was conducted. The results of the survey are described as follows.

Container Cargo: The number of sampled container trailer was 2,585 drivers and the sample rate is 5.3% in TPS, Berlian and Jamrud. Table 4.2.1 and Figure 4.2.1 shows the estimated container cargo distribution pattern between Tg. Perak and its direct hinterland. Overall, the container cargo volume to/from Surabaya city is the highest. In the surrounding areas of Surabaya city, such as Gresik and Sidoarjo, the unloaded container volume is higher than the loaded container volume. In other areas, i.e. Mojokerto city, Pasuruan, Malang and Probolinggo, the unloaded container volume is lower than the loaded container volume. It shows that industrial estates from these areas contribute to the high number of exports and these industrial estates support the transportation of container cargo. Thereby, exported goods tend to traverse longer distance than imported goods.

Table 4.2.1 Estimated Container Volume Distribution

TEU/Year	Container Total	
	Loading	Unloading
Kota Surabaya	385,000	370,000
Gresik	177,000	233,000
Kota Mojokerto	89,000	28,000
Other East Java	65,000	127,000
Pasuruan	58,000	37,000
Malang	55,000	32,000
Sidoarjo	46,000	72,000
Probolingggo	27,000	1,000
Central Java	14,000	5,000
Bojonegoro	7,000	3,000
Kab. Mojokerto	6,000	18,000
Lamongan	3,000	3,000

Non-container Cargo: The number of sampled non-container truck was 1,255 drivers and sample rate is 10.8% in Berlian and Jamrud. The highest volume of non-container cargo is towards Surabaya city and Sidoarjo has the second highest share. Mojokerto, Jombang and Pasuruan also generate quite a high volume of non-container cargo. On the other hand, the volume in Gresik is quite low because there is another public port located in Gresik. Estimated non-container cargo distribution is shown in Table 4.2.2 and Figure 4.2.2.

Table 4.2.2 Estimated Non-Container Volume Distribution

Ton/Year	Loading	Unloading
Kota Surabaya	4,928,000	1,696,000
Gresik	46,000	119,000
Kota Mojokerto	411,000	11,000
Kab. Mojokerto	34,000	0
Sidoarjo	1,465,000	457,000
Bangkalan	20,000	4,000
Pasuruan	264,000	225,000
Malang	26,000	11,000
Jombang	288,000	31,000
Sampang	10,000	0
Sumenep	9,000	5,000
Other East Java	325,000	352,000
Jakarta	21,000	15,000
Central Java	20,000	87,000
Yogyakarta	27,000	5,000

RoRo Cargo: The number of sampled Ro-Ro truck was 153 drivers and with a sample rate of 5.3% in Jamrud RoRo terminal. The results show that Surabaya city has significantly the highest share of cargo. The access distance to/from the direct hinterland is shorter than other cargo types. Estimated RoRo cargo distribution is shown at Table4.2.3.

Table 4.2.3 Estimated RoRo Cargo Distribution

Truck Using RoRo Terminal	Loading	Unloading
Kota Surabaya	82.8%	77.6%
Kota Mojokerto	0.5%	2.7%
Sidoarjo	0.4%	3.6%
Bangkalan	0.5%	-
Pasuruan	2.9%	2.7%
Malang	0.6%	4.7%
Jombang	0.1%	1.0%
Probolingggo	1.0%	1.4%
Other East Java	10.1%	1.0%
Container Station	0.0%	0.0%
Central Java	1.2%	5.3%
Total	100.0%	100.0%

Figure 4.2.1 Estimated Container Cargo Distribution Pattern in 2006

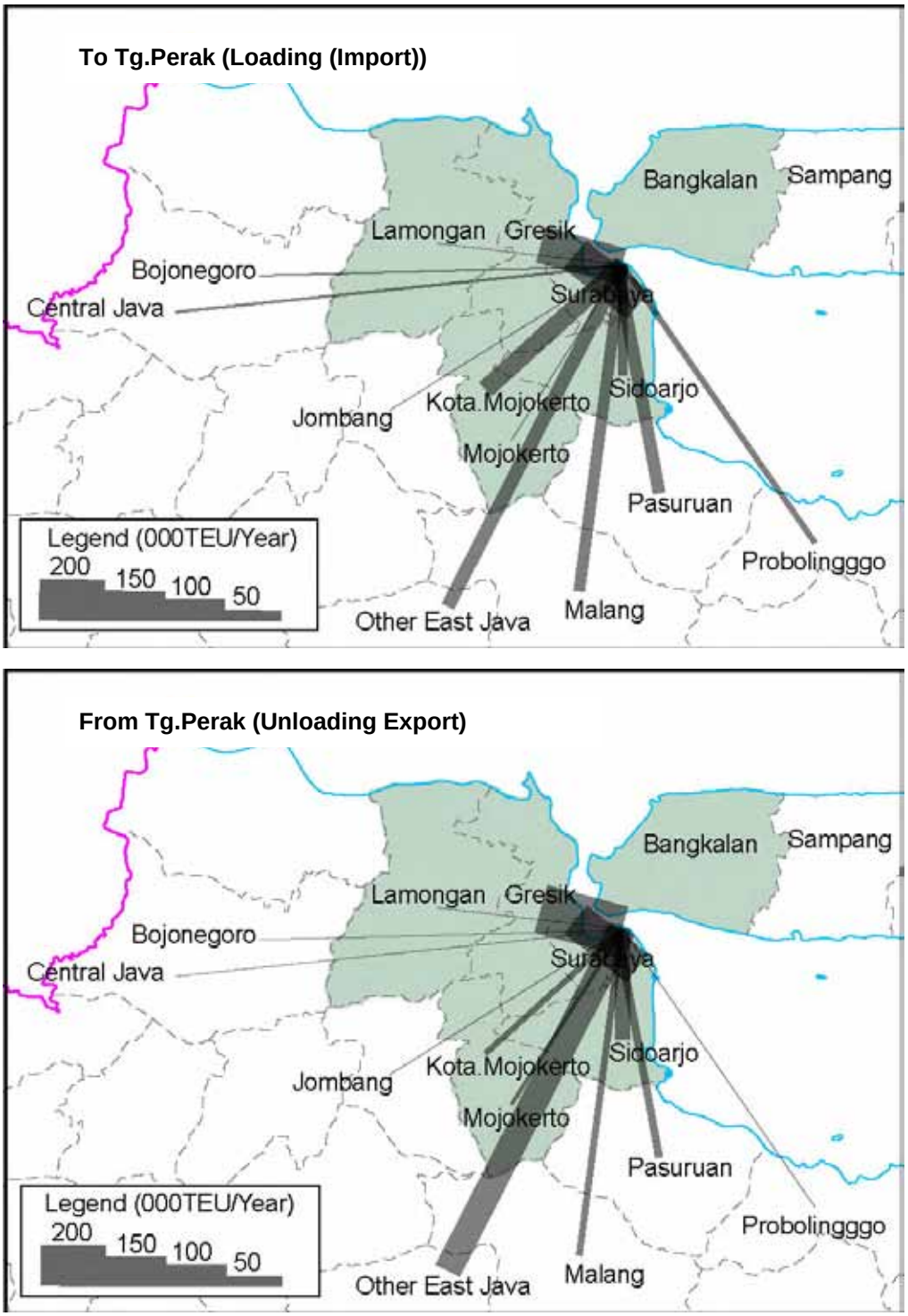


Figure 4.2.2 Estimated Non-Container Cargo Distribution Pattern in 2006

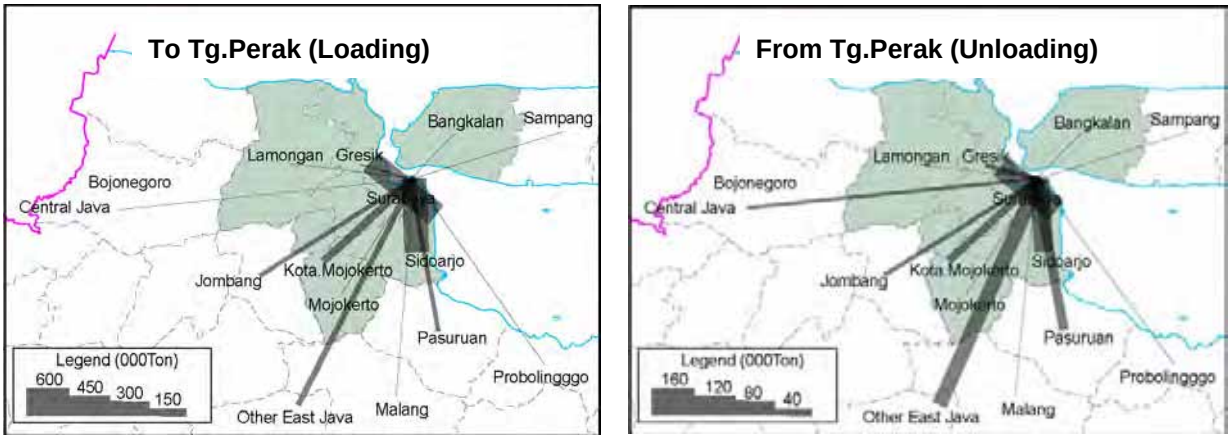
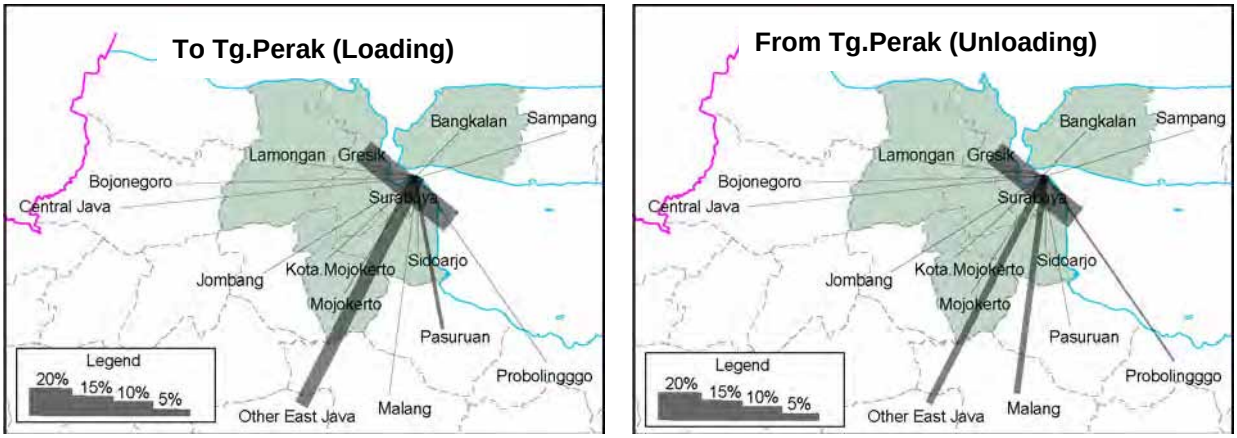


Figure 4.2.3 Estimated RoRo Cargo Distribution Pattern in 2006



2) Other Characteristics

a. Cargo Consignor/Consignee Type

Container Loading (Export): In the Study area, excluding Surabaya city, the highest percentage of container cargo comes from factory. On the other hand, in Surabaya city, the percentage is higher for warehouse rather than factory.

Container Unloading (Import): In general, the main destination for the unloaded container cargo is truck terminal. From the truck terminal, the cargo is further distributed in smaller lots by small trucks which can conveniently distribute the cargo to the final destination. In Surabaya city and other East Java, depots (which is similar to truck termimal) plays a major role as destination for unloaded container cargo.

Figure 4.2.4 Container Cargo by Origin & Destination Type

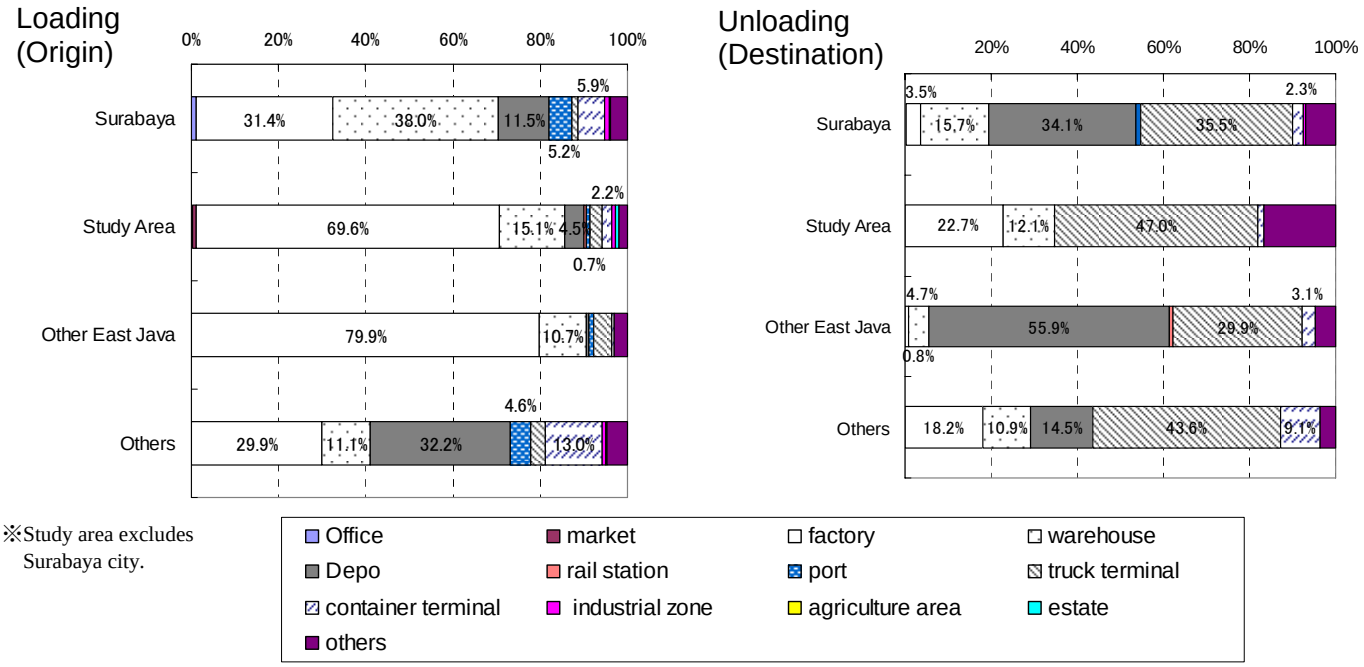
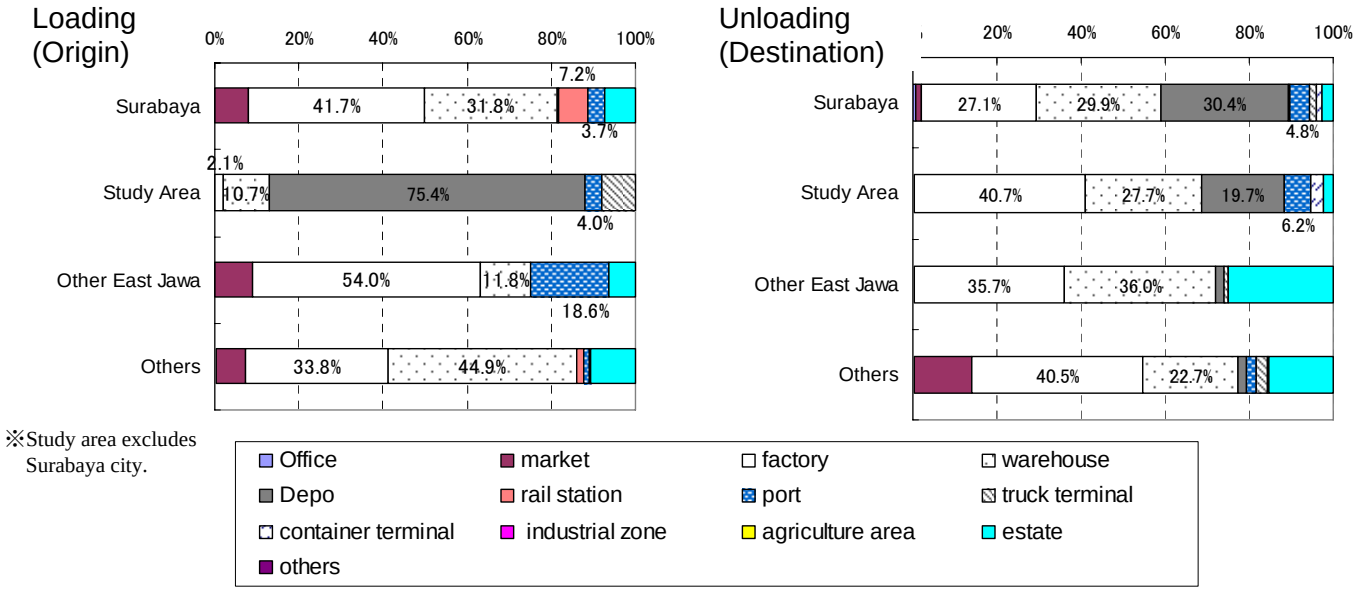


Figure 4.2.5 shows the distribution of non-container cargo by OD type between Tg. Perak and its direct hinterland.

Non-container Loading: Overall, the percentages of factory and warehouse as OD type for loaded non-container cargo are significantly higher than other types. In the Study area, the share of depot is 75.4%, and it is especially high in Sidoarjo. The share of railway station as OD type in Surabaya is only 7.2%.

Non-container Unloading: Overall, the percentages of factory and warehouse as OD type for unloaded non-container cargo are significantly higher than other OD type.

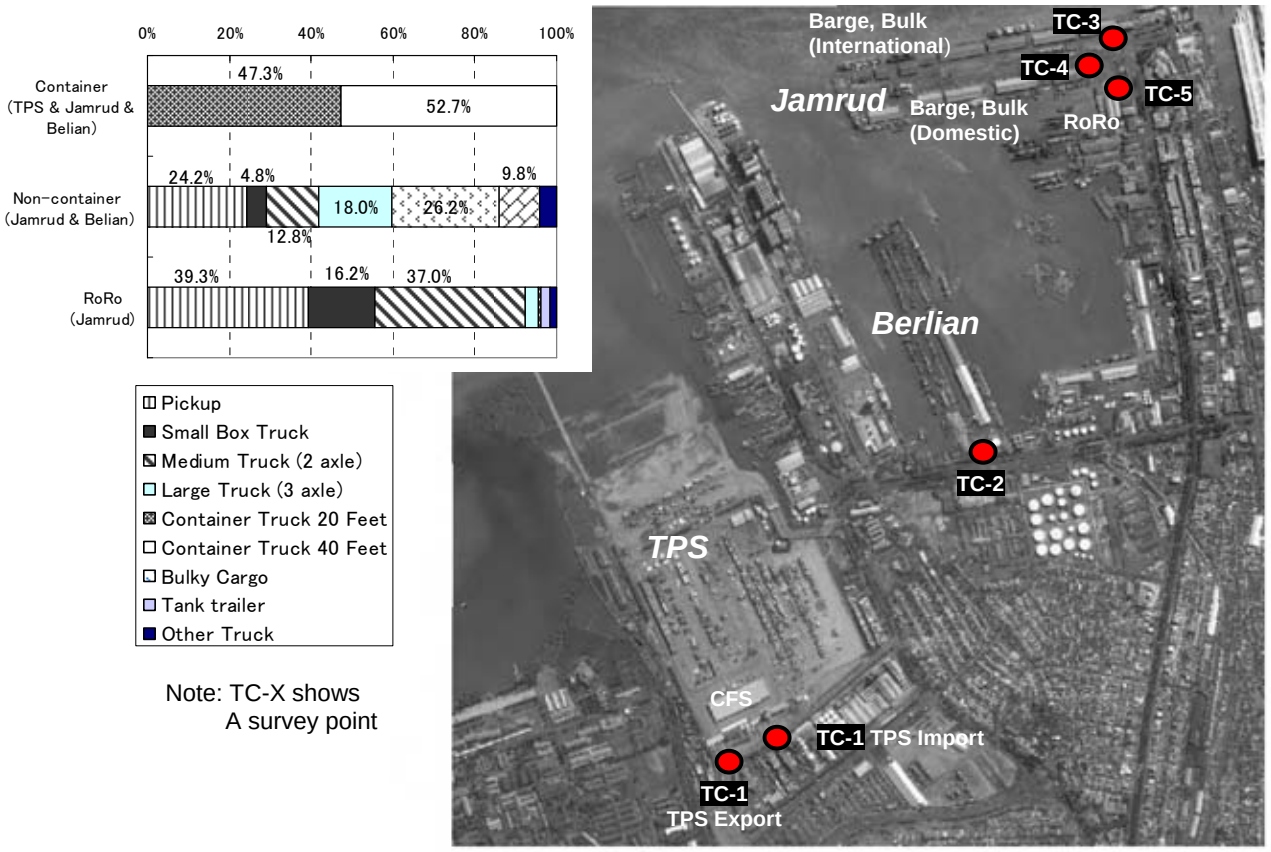
Figure 4.2.5 Non-Container Cargo of Origin & Destination Type



b. Vehicle Type

Figure 4.2.6 shows the vehicle types to/from Tg. Perak and the location map of the counting stations used in the truck count survey. In the container berths such as TPS, Jamrud and Berlian, there are only two types of vehicles, i.e. 40 foot container trucks and 20 foot container trucks. On the other hand, the truck types for non-container cargo are varied, e.g. pickups, medium trucks, large trucks, and bulky cargo. For Ro-Ro cargo, the vehicle size is appreciably smaller than the vehicle size used in other cargo types. The figure shows that most of the vehicles in the RoRo terminal are pickup trucks, small box trucks, and medium trucks.

Figure 4.2.6 Vehicle Type to/from Major Berth in Tg.Perak



Note: TC-X shows
A survey point

It is noted that the mud spouting and outflow incident in Porong, Kabupaten Sidoarja, which up to present has not been solved, discouraged the use of Tg. Perak port in 2006. The results of the truck counting and interview survey which was conducted on 16-20 December 2007. may have been affected by the incident.

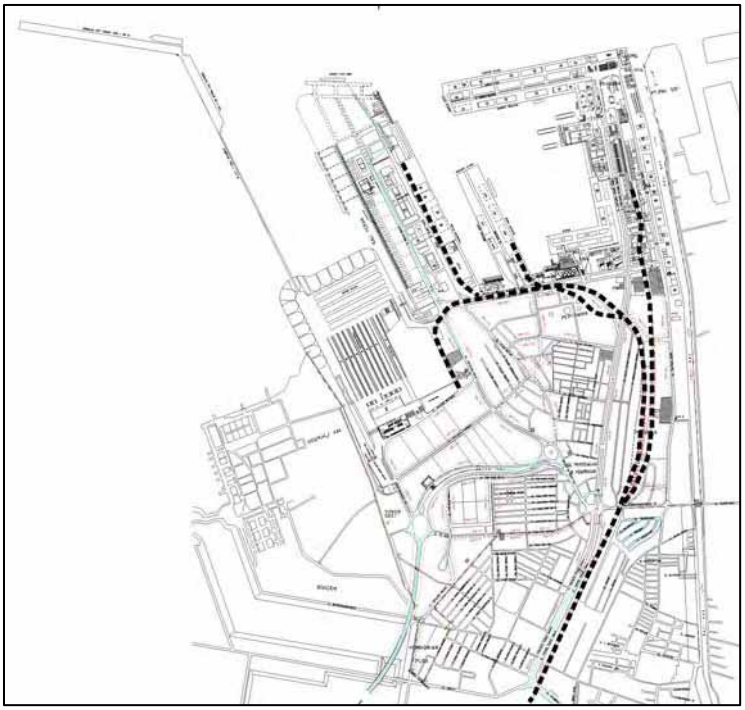
3) Rail and Rail Freight Service

Intra-regional Freight Rail. Railway transports cargo to Tanjung Perak through two ways. For container haulage, rail service is extended to Kalimas Station and then containers are transferred by truck. For other cargoes, Pasar Turi Station works as a transfer point between rail and truck. The central container handling station is located at Pasar Turi in Surabaya City. In Gresik, there is no branch line connecting to Gresik Port; however, some large industrial cargo shippers have siding lines such as Semen Gresik and Petrokimia.

Port Branch Line. There exists a railway track in the premises of Tg. Perak Port as illustrated in Figure 4.2.7. According to PT. KAI, this branch line is being rehabilitated and expanded to

double tracks by the Directorate General of Railways, MOT in 2007. After resumption, PT. KAI plans to revive the operation of freight train to deal with the container traffic in Tg. Perak port i.e. the berth of Nilam, Berlian and TPS. (Refer to Figure 4.2.7)

Figure 4.2.7 Railway Tracks in Tg. Perak



4) Port Access Hampered by Mud Spouting and Outflow

a. Incident TImeline

The mud outflow started on 29 May 2006 at the natural gas field operated by PT Lapindo Brantas Inc. along the Gempol-Porong segment of Surabaya-Gempol Toll Road in Sidoarjo around 36 km south from Tanjung Perak. The mudflow has been continuing to date, and no effective technical solution to stop this mudflow has been found yet.

There are 23 drilling rigs operating in and around this area for crude oil or gas. Of which 8 wells have been extracting natural gas already. One of the drilling rigs reached a depth of over 3,000 meters underground in May 2006. Two days after the earthquake which killed over 6,000 people in Yogyakarta, neighboring Central Java, the mud started seeping into the well at a depth around 1,800 meters, and cement plugs were put in to stop it. However this was ineffective, as pressurized hot mud forced its way to the surface near the well.

A large number of people were affected by the high level of hydrogen sulfide which escaped when the mudflow broke through to the surface, and 900 people required medial treatment. The mud flowed continuously at a rate of 1.5 cubic meters per second or 65,000 cubic meters per day and the mud has inundated eight villages covering an area of 400 hectares already. Around 3,300 families or 16,500 people had to be relocated by October 2006, and at present the number of people affected directly by this mudflow disaster reached almost 30,000

On 22 November 2006, the gas pipeline (28 inch diameter) owned and operated by East Java Gas Pipeline (EJGP) crossing over the area inundated by mud was broken and exploded killing

of 12 persons. The EJGP has been shutdown following the explosion. This gas pipeline explosion has disrupted upstream gas production and deliveries to users in the surrounding area. Several gas production operations have been shut down as well. As the gas production and delivery was disrupted, it has impacted major consumers of gas such as PT PLN for power generation and PT Petrokimia Gresik for fertilizer production. Industries in the provinces of East Java have been greatly affected, particularly in and around Surabaya.

In March 2007, the jumper pipeline of around 2.5 km was installed tentatively to restore the gas distribution situation and 140 MMSCFD of gas is channeled through the pipeline to the customers in the province.

Because of so called “Sidoarjo Mudflow Disaster”, the southern part of Surabaya – Gempol toll road, national highway, railroad, water transmission line, and power transmission line have lost their function and are required to be relocated.

The following vividly depicts the extent and magnitude of the devastation caused by the Sidoarjo Mudflow Disaster..

Figure 4.2.8 Disastrous Conditions

Residential Area covered by mud

Toll road inundated by mud

Mudflow Disaster Area

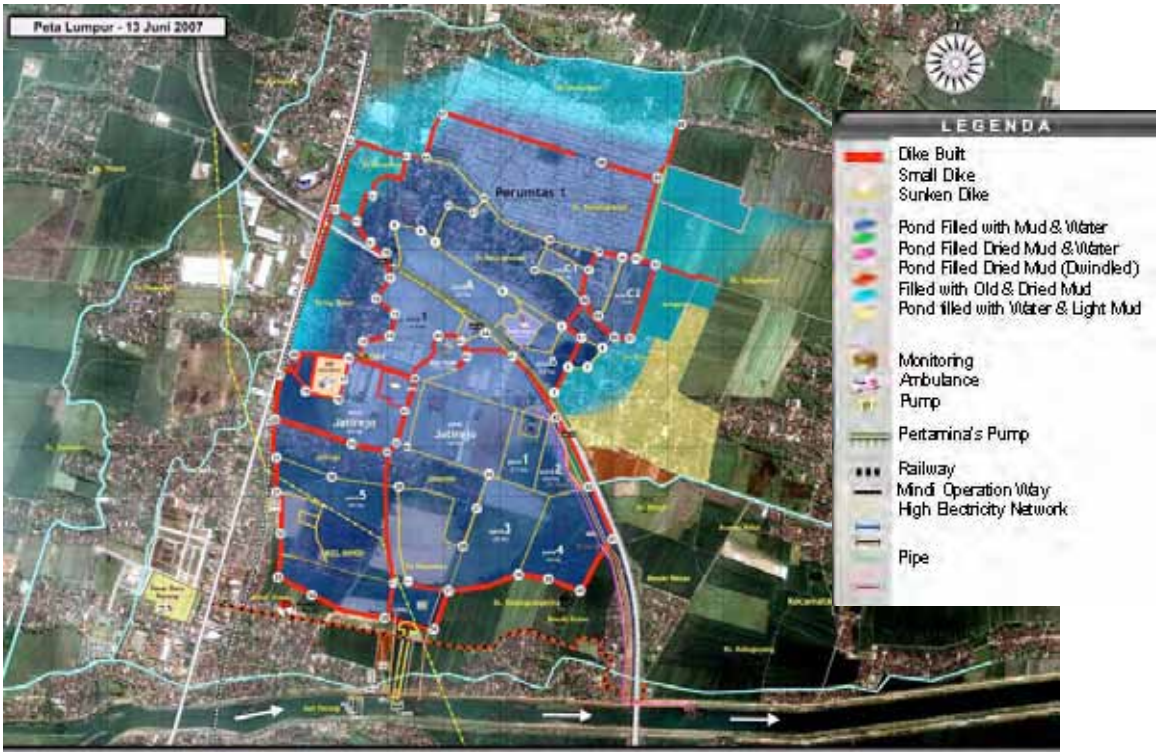
b. Restoration Effects

The Board of the Sidoarjo Mud Control (BPPLS) was established in April 2007 and is directly under the presidential office to undertake coordination of various measures to restore the situation and remedy the failure of infrastructures in and around disaster area. The realignment of highways, railways, water and power transmission lines, and gas pipeline is being planned and the emergency budget for the implementation of restoration works has been earmarked from the national budget although it is not sufficient for full recovery

At present the construction and maintenance of dikes have been going on to prevent further overflow of mud to the surrounding area. Figure 4.2.9 illustrates the scheme for the construction of such dikes to prevent further outflow of mud.

The height of the dike constructed just around the mudflow well reached already 18 meters. Meanwhile, the height of dike preventing the outflow of mud is 7 meters but it is going to be increased to 9 to 11 meters in this year.

Figure 4.2.9 Area-wide Restoration Scheme



Source: Board of the Sidoarjo Mud Control (BPPLS)

c. Infrastructure Restoration and Alternative Development

Toll Road: The detailed implementation plan of relocation of toll way has completed yet. Nontheless, the new toll road section is planned to be relocated 3.5 km west from the outer dike, with a length of around 12 km. Assuming a unit cost per km is around Rp. 72 billion or US$ 8 million per km, the total cost for the relocation of the toll road is around Rp. 864 billion or US$ 96 million. The closure of a part of Surabaya – Gempol toll road at southernmost portion has increased transport time by around 2.5 hours; while, transport cost increased by 20% or more, substantially impacting shippers and business entities especially the manufacturers located in the PIER where many Japanese manufactures are concentrated (27 Japanese companies).

Railroad: The railroad segment affected by the mudflow is located at markers km 33+400 – km 34+000, a total length of around 600 meters between Tanggulangin – Porong line. 46 trains pass this section daily. The relocation of the railroad is planned on west side of the mud flow center by distance of 4 km. The total length of the railroad bypass is around 18 km, at as estimated cost of around Rp. 450 billion or US$ 50 million. Rp. 100 billion or US$ 11.0 million has been already allocated from the supplemented national budget and the balance will be arranged from the budget of the Ministry of Transport.

Gas Pipeline: The jumper gas pipeline was constructed as a tentative solution for the transmission of gas mostly to Gresik industrial consumers at a cost of Rp. 50 billion or US$ 5 million. The cost of a long-term gas pipeline bypass is planned to be located at 12 km east of the affected area at a cost of around Rp. 300 billion or US$ 33.3 million.

Therfore, the total cost for relocation of these transport infrastructures alone will be around Rp. 2.05 trillion or US$ 230 million.

5) Impact Estimation on Hampered Port Access

Location of Industrial Estate in GKS: There are seven (7) industrial estates in East Java province. The outlines of these industrial estates are tabulated in Table 4.2.4.

Table 4.2.4 Outlines of Industrial Estate in East Java

Name of Industrial Estate	Location	Area	Number of Tenant	Distance to Tanjung Perak Port	Distance to Juanda Airport
Surabaya Industrial Estate	Benowo, Surabaya	24 ha.	100	15 km	30 km
Surabaya Industrial Estate	Rungkut, Surabaya	332 ha.	371	19 km	5 km
Surabaya Industrial Estate	Brebek, Sidoarjo				
Gresik Industrial Estate	Gresik, Gresik	91 ha.	13	20 km	34 km
Maspion Industrial Estate	Gresik, Gresik	140 ha.	14	23 km	38 km
Ngoro Industrial Persada	Mojokerto, Mojokerto	213 ha.	52	55 km	40 km
Pasuruan Industrial Estate	Rembang, Pasuruan	170 ha.	52	60 km	45 km
Suri Mulia Industrial Estate	Tandes, Surabaya	200 ha.	150	9 km	15 km
Total		1,170 ha.	752		

Note: Various sources collected by JICA Study Team

Foreign manufacturers accounts for around 22% of the total number of tenants in the industrial estates in GKS as an average, while Japanese manufacturers totaling 27 is concentrated in Pasuruan. The industrial estate of Pasuruan so called Pasuruan Industrial Estate Rembang (PIER) was developed and managed by a Japanese industrial estate development company. Therefore, the share of foreign manufactures in this industrial estate is quite high as it accounts for around 68% of which 40% are Japanese manufacturers.

Location of Mudflow Disaster Area: The location of mudflow disaster flow area in relation to the industrial zones of GKS is illustrated in Figure 4.2.10. The toll road, which closed due to the Sidoarjo Mudflow Disaster, is thought to be the most important toll road segment connecting Tanjung Perak Port and the southern part of GKS as depcited in the figure. The factories most affected by the disaster and closure of the toll road near Gempol are those in Pasuruan and Probolinggo. As Japanese manufactures are concentrated in these areas, the manufacturers or shippers who have been most adversely affected by the closure of the southern part of Surabaya – Gempol Toll Road can be considered to be Japanese manufacturers.

Figure 4.2.10 Sidoarjo Mudflow Disaster Area and Industrial Zone

Questionnaire Survey: A questionnaire survey was carried out to examine further the adverse affects of Sidoarjo Mudflow Disaster on Japanese companies in Surabaya. Twenty questionnaires were sent to Japanese companies and obtained nine (9) respondents. Seven out of 9 responded companies are located in PIER. The result of this questionnaire survey is summarized in Table 4.2.5.

Based on the responses, most of Japanese manufacturers in Pasuruan or in PIER would continue to be in PIER although the inland transport cost has increased by almost 20%, added 2.5 hours to transport time, and caused inconvenience to employees

However, there a lot of complaints against the delay of restoration works which is to be carried out by the government agencies.

Table 4.2.5 Summary of Questionnaire Survey Results on Mudflow Disaster

Items	Answers	Remarks
Smallest number of staff	100	Wooden furniture
Largest number of staff	2,300	Lighting equipment, lamps, etc.
Average number of staff	590	
Export of goods by container per month	68	TEU per month
Import of goods by container per month	8	TEU per month
Average container transport cost (Rp.)	1,800,000	Pasuruan – Tj. Perak Port per TEU
Average container transport cost (US$)	200	Per 20' container
Estimated transport cost per month	15,200	Inland transport cost in US$
Transport time before closure	1.90	Hours per trip (Pasuruan – Tj. Perak)
Transport time after closure	4.22	Hours per trip
Increased time needed for transport	2.32	Hours per trip
Average cost increase in %	18	
Toll road should be relocated at first and urgently	100	Plural answer
National road should be improved urgently	67	Plural answer
Barge transport should be provided	22	Plural answer
Railway transport should be improved	11	Plural answer
Intending to expand the business (%)	22	Plural answer
Intending to business to continue at same location (%)	89	Plural answer
Intending to shrink the business (%)	22	Plural answer
Intending to move to other country	22	Plural answer
Intending to transfer to other location in Indonesia (%)	11	Plural answer

Source: JICA Study Team

Assuming the total annual handling volume of loaded container in Tj. Perak Port in 2006 is 1.5 million TEU and the southern area beyond Gempol accounts for say 15% of generation of export container and 10% of destination of import container judging from the distribution of number of manufacturing companies having factories in the industrial estate in East Java. Thereby the total container traffic volume generated by the area which is adversely affected by Sidoarjo Mudflow Disaster can be estimated to 12.5 % of the total container volume of Tj Perak. Port. As the estimated increase in cost for land transport due to mudflow problem is US$ 36 per TEU, the total increased transport cost for container transport passing this area would be around US$ 6.75 million per year which is quite a large financial loss.

The financial loss estimated above covers only the direct loss. Indirect loss due to the detour of land transport include increased labor cost due to overtime pay for the workers as a result of dealyed deliveries of materials and goods, longer commutes by staff commuting, longer period of stocking of materials and products in warehouses, reduction of productivity due to fatigue of staff as a result of longer traveling time and hardship, etc.

If these indirect economic losses are accounted and added to the direct financial loss, the figure could be 2 – 3 times of the direct financial loss or say US$ 13 – 20 million per year. This is more than the total income of laborers working in the Pasuruan industrial estates.

5 ASSESSMENT ON GREATER SURABAYA METROPOLITAN PORTS

5.1 Cost and Service

1) Users' Costs

a. Service and Revenue

PELINDO-III provides various services including navigation, berthing, cargo handling and supply of water and fuel, and are its sources of revenues. In addition, large dividends are made from its subsidiaries container terminal operation, which accounts for more than 55% of total operating revenue, wherein loading and unloading of container is nearly 70% as shown in the table below. Of the Container Terminal revenue of 988 billion Rp, TPS accounts for 739 million Rp and the rest is from TPK in Semarang Port.

For navigation services such as pilotage and tug, PELINDO-III is responsible for and provides all tugs and pilots for calling vessels including container vessels going to TPS. Vessels pay directly to PELINDO-III, which covers 16% of its revenues. For the conventional terminal, berthing service and cargo handling services constitute 5% and 10% of revenues respectively.

Table 5.1.1 Revenue Detail from Services in PELINDO III

(Mil Rp)	2003	2004	2005	2006	Composition
Vessel Navigation Service	158,415	206,052	257,262	290,745	16%
Berthing Service	66,983	67,390	71,855	89,083	5%
Cargo Handling Service	84,888	115,471	147,016	172,174	10%
Water & Electricity etc	32,011	44,431	54,341	63,182	4%
Joint operation	88,700	29,646	16,560	67,212	4%
Dedicated Berth	9,253	31,378	34,292	34,760	2%
Various other business	52,112	31,002	34,148	45,474	3%
Container Terminal (TPS+TPK)	877,692	958,966	1,055,732	988,306	**55%**
Hospital & related company	13,833	18,533	22,257	31,964	2%
Operational Revenue Total	1,383,887	1,502,869	1,693,463	1,782,900	100%

Source: Financial Statements, PELINDO III

Table 5.1.2 Service and Revenue of TPS

(Mil Rp)	2003	2004	2005	2006	Composition
Loading and Unloading	591,172	652,194	698,775	508,731	69%
Storage and facility service	32,090	26,516	31,502	83,622	11%
Supplementary Service	22,593	25,559	27,898	105,120	14%
Electricity etc	12,492	17,506	15,795	14,729	2%
Buoy & Mooring Service	14,394	14,376	14,174	13,951	2%
Others	9,752	10,838	18,105	13,116	2%
Operational Revenue Total	682,493	746,989	806,249	739,269	100%

Source: Financial Statements, PELINDO III

TPS revenue in 2006 represented a drop of 7 % compared with year 2005 figures. According to TPS, the most significant contributor to the revenue decrease is the regulated tariff reduced by 25% which was determined by the Minister of Transport in November 2005.

Table 5.1.3 Per TEU Revenue by Container Handling and Vessel Navigation at TPS

(Rp/TEU throughput)	2005	2006	Average
Loading and Unloading	656,066	483,603	590,583
Storage and facility service	29,577	79,492	41,762
Supplementary Service	26,193	99,928	43,362
Electricity etc	14,830	14,001	14,546
Mooring Service	13,308	13,262	13,730
Others	16,998	12,468	12,428
Estimated Navigation Revenue from Vessel to TPS	18,224	20,083	19,153
Operational Revenue Total Per TEU (TPS+Nav)	**775,195**	**722,837**	**749,016**

Source: JICA consultant's calculation based on Cargo data and Financial Statements, PELINDO III
Note: Based on vessel sizes of ships calling at TPS

b. Service and Expense

PELINDO III accounting records of expense does not correspond to service items. At any rate, composition of major expense items and their respective shares are as follows "Salary and Wages" at 20%, "Operation" and "maintenance" together at 23%, "Depreciation" at 15%, and "Lease charges" at 21%.

Meanwhile, TPS Operating expense consists of several major items, including "Royalty Payment", "Salary and wages", and "Lease payment". Each having an allocation of not more than 17% each and in aggregate comprise more than 50%. "Maintenance", "Spare parts" and "depreciation" account for one third of total operating costs. The operating expense has grown by a rate of 16% per annum.

Table 5.1.4 Operating Expense Detail in PELINDO III

(Mil Rp)	2003	2004	2005	2006	Composition
Salary and Wages	173,177	201,490	192,644	227,124	20%
Operational Material	102,617	100,737	125,417	163,228	14%
Maintenance Cost	84,003	92,824	103,308	100,050	9%
Depreciation	128,061	146,158	167,822	167,042	15%
Insurance	14,082	20,793	41,116	48,810	4%
Lease Charges	145,247	165,443	183,179	240,342	21%
Administration Office	17,029	14,781	16,376	17,041	2%
General expense	159,872	154,099	164,590	166,527	15%
Total Operating Expense	**824,088**	**896,325**	**994,452**	**1,130,165**	**100%**

Source: Financial Statements, PELINDO III

Table 5.1.5 Per TEU Expense by Container Handling and Vessel Navigation at TPS

(Rp/TEU throughput)	2005	2006	Average
Contribution under the Sharing Agreement with PELINDO III	75,737	70,468	73,102
Salary and Wages	66,167	62,826	64,496
Lease Payment	67,348	65,996	66,672
Maintenance Cost	41,458	37,923	39,690
Spare Parts and Fuel	32,291	43,978	38,134
Depreciation	32,202	31,698	31,950
General expense	27,883	24,456	26,170
Insurance	14,610	18,301	16,455
Social Development Contribution	7,373	2,603	4,988
Admin Office	3,284	2,837	3,060
Estimated Navigation Expense for TPS (Per TEU)	10,704	12,732	11,718
Operational Expense Total (TPS+Nav)	**379,056**	**373,816**	**376,436**

Source: JICA consultant's calculation based on Cargo data and Financial Statements, PELINDO III

c. User's Costs in Comparison

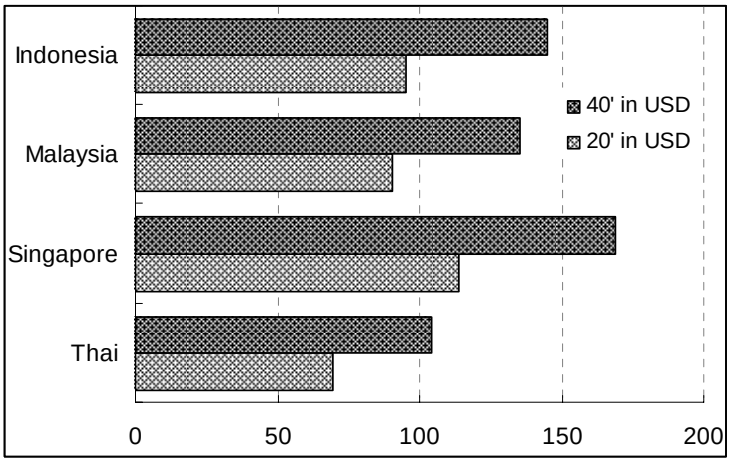
Port tariff in Indonesia for container handling is applied uniformly at all ports, thus charges at Surabaya Container Terminal and at Tg Priok is the same. Ports in Indonesia do not have function of hub port, and mainly works as feeder ports to Singapore, thus price negotiation is not effective for port users.

Government has control over Container Handling Charges (CHC) which is set uniformly for all container terminals in Indonesia. Based on this tariff, shipping companies set a uniform Terminal Handling Charge (THC), and is paid for by shippers. Similarly, the rate is the same at Jakarta International Container Terminal (JICT) in Tg. Priok and Terminal Petikemas Surabaya (TPS) in Tg. Perak in Surabaya as a result of uniform CHC.

These rates had been often criticized as very high in the early 2000's. So the government declared to lower the CHC by 25% in 2005. In relation to this change, shipping companies voluntarily offered to lower the THC by 25%, but the government pushed for it to be lowered by 37%.

It was a rather aggresive action on the part of the government by intervening in private-to-private trade and appears that the government was giving benefit to importers, at the expense of shipping companies. As a result, THC in Indonesia has become comparable to that of Malaysia and lower than that of Singapore.

Figure 5.1.1 THC for 20' and 40' Container



Source: JICA Study Team

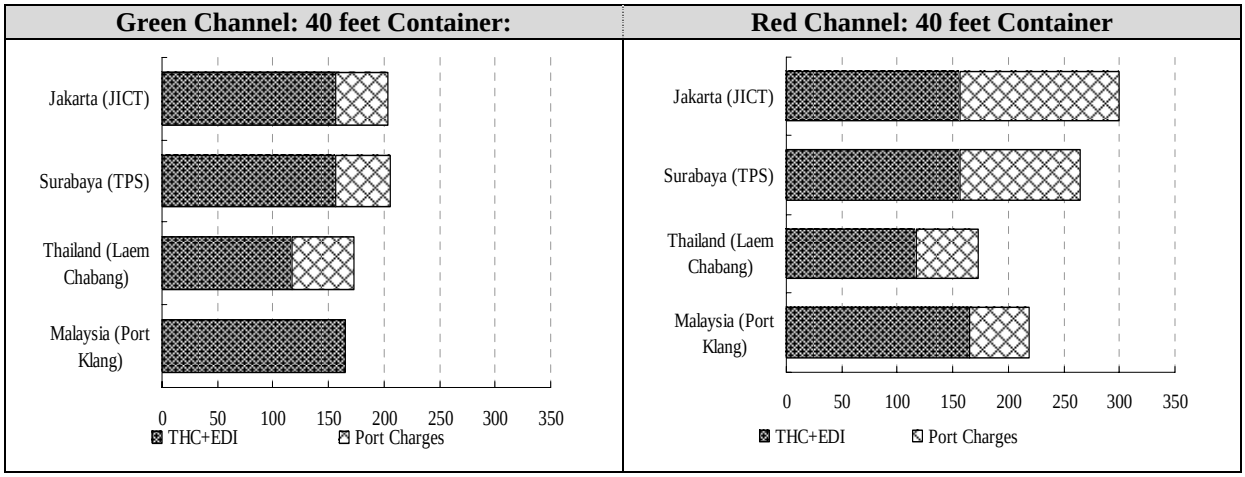
However, at the same time, the government allowed PT PELINDO (Indonesia Port Corporations as State-own Company) to increase its tariff of Lift-on/off charges and resulted in a 500% increase on average. As a result, the total cost at port remained high or even increased especially for cargoes in the red channel. Figures below illustrate THC plus lift-on/off charges based on typical movement of cargo, showing that the total cost at Indonesian Ports being higher than other ports in neighboring countries, especially in red channeled cargo.

Based on typical cargo movement at major ports in SE Asia, and considering that majority of containers are 40 footers for international cargo, comparisons are made by 40' containers. Total charges related to port operations reached USD 200 for green channeled cargo in Indonesia. This is slightly higher than those in other countries being approximately at USD 160 at Malaysia and USD 170 at Thailand. Here green channel means that there is no physical inspection and process of custom clearance is smooth and generally quick within a few days, thereby storage charge is minimum and lift on/off charges are also minimum.

On the other hand, in the case of red channel wherein there is physical inspection of contents of container, lift-on/off charges would be more than double and many other labor cost and storage charges are added, and thereby costs could reach USD300 per 40 feet container in Jakarta and 270 in Surabaya. This is significantly expensive compared with Port Klang in Malaysia (USD 220), and Laem Chabang in Thailand (USD170). Obtained data from the customs office at Tg. Perak indicates that the imported containers cleared through red channel account for as large as 27%. Thus, this issue should not be underestimated.

In other countries, even at red channel, additional days are less than one day, and after inspection, cargo release will be immediately possible. In Indonesia, port operation takes time and lift-on/off charges are extremely expensive in Tg. Priok. Surabaya TPS is better with less congestion and quick inspection, but still behind international level service, in terms of cost to customers.

Figure 5.1.2 Port Related Charges Compared (in US$)



Source: JICA Study Team

2) Productivity of Port Operation

a. Container Cargo Handling

As for terminal efficiency and productivity for container operations, total working hour of gantry cranes are 40 hours for international ships and 23 hours for interisland at TPS. Two gantry cranes are used for a ship. That means average working hour per crane per ship is 20 hours. Gross working production is 25 boxes/crane/hour for international and 30 boxes/crane/hour for interisland. The production ratio of interisland cargos is much bigger than that of international cargos, wherein it is surmised that handling time of interisland container is faster because of smaller ship sizes. (see Table 5.1.6)

It is noted that net working production ratio is larger than gross working production ratio, because gross working time includes idle time and break time, but net working time is actual working time of container handling.

Table 5.1.6 Efficiency of Container Handling

Item	International	Inter-island
Total Crane Working Hour (hr) per Ship	40	23
Berth Time (hr) (from arriving berth to leaving berth)	23	16
Port Stay (hr) (from Karangjamuang to leaving berth)	29	26
Gross Working Production (Boxes/Crane/hr)	25	30
Net Working Production (Boxes/Crane/hr)	30	35

Note: Example of some shipping company

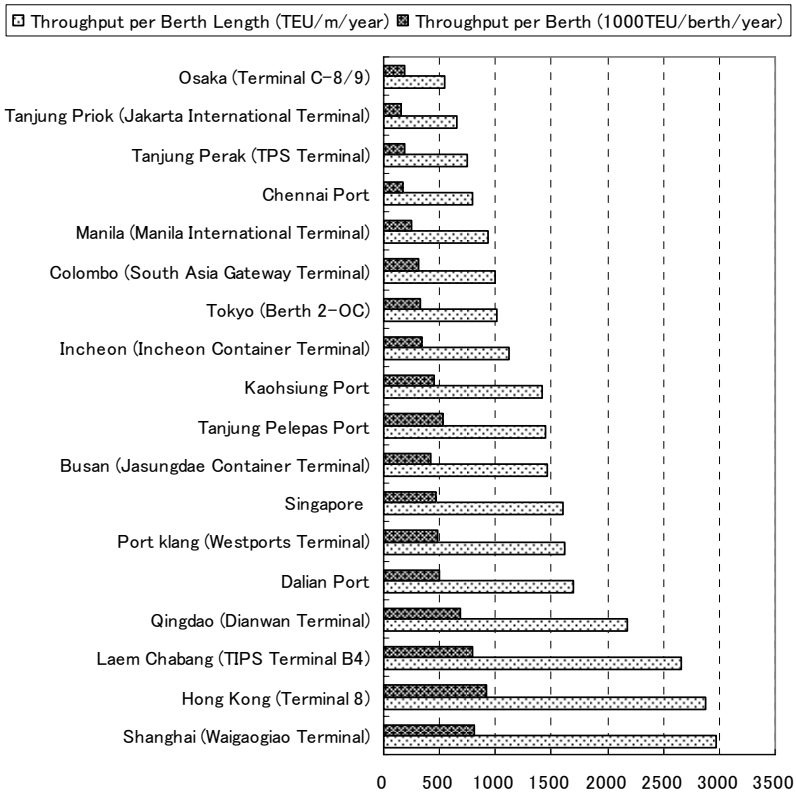
Productivity of container handling at TPS is 25.35 boxes/ crane/ hour, and is rather good performance, compared to the world-class container terminals. Some big terminals like Hong Kong, Singapore don't reach 30 boxes/ crane/hour. However, even if the productivity of those terminals are less than 30 boxes/crane/hour, these terminals can use 3 cranes or more at one time for a ship, and that makes a ship stay shorter than the case of using 2 high productivity cranes. It is however noted that sizes of ship arriving at Surabaya are not so big. Most of container ships are less than 2000 TEUs capacity. It is therefore not considered to be efficient to use more than 2 cranes. (see Table 5.1.7)

Table 5.1.7 Comparison of Productivity of Container Handling (boxes/crane/hr)

Port Name	International	Source
TPS	25.35	Average number of one of TPS uer's in 2006
JICT (Tg. Priok)	20.56	
Koja (Tg. Priok)	25.71	The Study for Development of the Greater Jakarta Metropolitan Ports (Data shows the number of 2001)
Hong Kong	21-25	
Singapore	22-24	The Study for Development of the Manila Metropolitan Port (Data show the number of 2000 (2001)
Kaohshiung	25-28	
Busan	22-25	
Tokyo	35-38	
MICT (Philippines)	35	
South Harbor (Philippines)	25	

Figure 5.1.3 shows comparison of berth productivity among world-famous container terminals. Berth productivity of TPS is 179,000 TEUs/berth and 790 TEUs/m. That indicates rather low productivities, compared to other terminals. Shanghai, Hong Kong, and Laem Chabang are some of the high production terminals, as they are world hub ports or mother ports handling huge cargo volume. Thus, it is not appropriate to pit those ports, against Surabaya as it is mostly used for a feeder port. For example, the berth and yard occupancy ratio of TPS is 36.9% and 32.3 %, respectively, in 2006. Thereby the terminal is not so busy now, but if it is used fully, the possible berth productivity is projected to be 400,000 to 500,000 TEUs/berth and 1000 -1500 TEUs/m.

Figure 5.1.3 Comparison of Berth Productivity among Container Terminal



Source: Based on Containerization International 2007

b. Non-Container Cargo Handling

For non-containerized cargo operation, the cargo handling efficiency is shown in Table 5.1.8. International cargo handling is much efficient than domestic cargo on every type of cargo.

Table 5.1.8 Cargo Handling Efficiency (ton/ship/day; 2006)

Type of Cargo	International	Domestic
General Cargo	2,793	753
Bag Cargo	1,694	718
Grain/Powder Type Bulk	7,019	1,966
Liquid Bulk	1,679	1,217
Pallet/Unit	505	136

Source: PELINDO III

Table 5.1.9 shows comparison of productivity of conventional cargo handling between Tanjung Perak and Tanjung Priok. Productivity of dry bulk at Tanjung Perak is higher than that at Tanjung Priok, but other cargo's productivity shows the contrary. Cargo handling productivity should therefore be improved more.

Table 5.1.9 Comparison of Productivity of Conventional Cargo Handling

Cargo Items ((ton / gang / hr))	Tg. Perak		Tg. Priok
	International	Domestic	2002 March
Bag	30	20	37.34
Liquid Bulk	88	72	150.03
Dry Bulk	123	58	101.84
General Cargo	27	12	33.3

Source: Data of Tg. Perak is based on PELINDO III's Information. Data of Tg. Priok is based on The Study for Development of the Greater Jakarta Metropolitan Ports

Table 5.1.10 shows average productivity of conventional terminals. Jamrud Terminal has the best productivity indicators except for berth occupancy ratio among conventional terminals. BOR of Nilam and Berlian terminals is larger than that of Jamrud terminal, but their BTP is noticeably lower. This means the former are occupied longer by ships than the latter terminal, but the latter terminal is much busier in terms of cargo handled.

Table 5.1.10 Average Productivity of Terminal (2006)

	Jumrud	Nilam/Berlian	Mirah/Kalimas	Notes
BOR (%)	58	65	-	Berth Occupancy Ratio
BTP (t/m)	5,614	3,612	871	Berth Throughput
SOR (%)	11.55	2.23	6.03	Shed Occupancy Ratio
STP(t/m^2)	16.23	5.68	12.11	Shed Throughput
YOR (%)	5.24	3.58	0.67	Yard Occupancy Ratio
YTP (t/m^2)	33.04	5.47	2.41	Yard Throughput

Note: Based on PELINDO 3 Statistical Data

At any rate, BORs of Jamrud and Nilam/Berlian terminals are over 50% and BTPs of both terminals are over 3000 ton/m, which means that the terminals are so busy that some ships must wait for berthing at times. BTP of Kalimas Terminal is only 871t/m as it is a traditional terminal and the cargo handling is mostly done manually without any equipment. Even though the handling system is very primitive, its BTP indicates a rather high level, as the terminal is always crowded with traditional local ships.

Jamrud terminal indicates high levels of SOR, STP, YOR and YTP. That means sheds and yards at Jamrud are almost full. On the other hand, SOR of Nilam/Berlian terminal for non-container cargos is less than that of Kalimas terminal, so sheds at Nilam/Berlian is not being used effectively.

c. Working Shift

Another aspect of operation of conventional terminals is the work shifts of longshoremen. Based on an agreement, longshoremen must be provided by TKBM (Stevedoring Workers Cooperation). The process of acquiring their services is as follows. Firstly, shipping companies request stevedore companies for longshoremen a day before the ships arrive at the port. Then the stevedore companies request TKBM to provide longshoremen for their cargo handling. Then TKBM provides longshoremen for the cargo handling of ships. Working hours is based on are three shifts a day, but the longshoremen service is not the full 24 hours in a day due to to long-standing custom, wherein they would work only 15 hours a day. (see Table 5.1.11)

Table 5.1.11 Actual Working Hours of Longshoremen at Tg. Perak

Shift	Rules	Actual Example 1	Actual Example 2
1st Shift	8:00 - 16:00	8:30 - 11:30	8:00 - 11:30
		(11:30 - 13:00 Lunch Break)	(11:30 - 12:00 Lunch Break)
		13:00 -16:00	12:00 - 16:00
2nd Shift	16:00 - 24:00	16:00 - 17:00	16:00 - 17:30
		(17:00 - 19:00 Dinner Break)	(17:30 - 18:00 Dinner Break)
		19:00 - 23:00	18:00 - 23:30
3rd Shift	0:00 - 8:00	1:00 - 5:00	0:00 - 7:00
Total Hour	24 hours	15 hours	21.5 hours

Note: Based on our interview research

5.2 Port Users' Assessment

1) Assessment from Shipping Companies

An interview survey was conducted on shipping companies to analyze user's satisfaction of Surabaya port. In this survey, the answers were given by 20 container shipping companies and 14 bulk and break bulk (B/BB) shipping companies.

a. Time in Port and Yard

Vessel Waiting time & Staying time: Table 5.2.1 shows the vessel waiting time at anchorage point and vessel staying time in Tg. Perak by shipping company types (Container & Break Bulk). 44% of container shipping companies answered less than 6 hours waiting time at anchorage; while, half of B/BB shipping companies answered 1 day to 2days. It means that the container ships can berth at the port more easily than breakbulk and bulk cargo ships. The vessel staying time also shows a similar tendency.

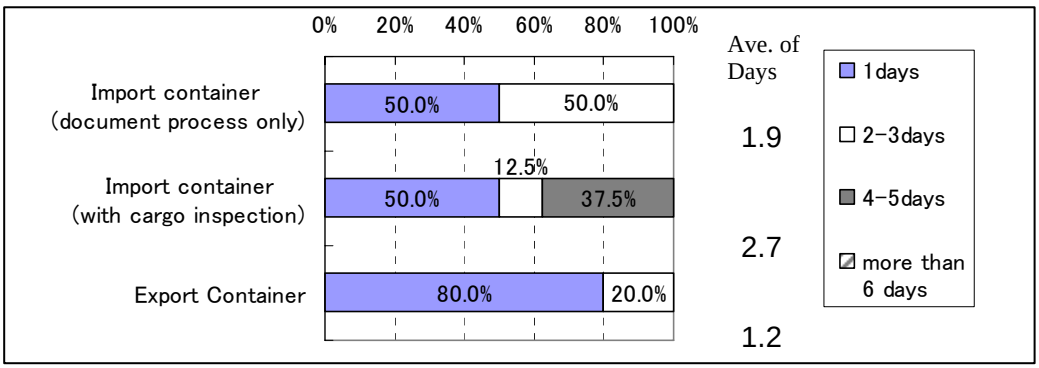
Table 5.2.1 Vessel Waiting Time & Staying Time

		Shipping Company (Container)	Shipping Company (B/BB)
Vessel Waiting Time at Anchorage Point	0 - 6 hours	44%	13%
	6 - half day	0%	0%
	half day - 1 day	11%	25%
	1 day - 2 days	11%	50%
	more than 2 days	33%	13%
	Total	100%	100%
Vessel Staying Time (day) (Average)	1 day	67%	20%
	2 - 3 days	22%	40%
	4 - 5days	11%	30%
	more than 6 days	0%	10%
	Total	100%	100%

Source: JICA Study Team

Container Dweling Time (Import/Export Permission): Figure 5.2.1 illustrates the import/export container dweling time. For imported container with cargo inspection, only 50% of shipping companies spent one day, while other companies had to spend longer time, some up to five days. On the other hand, the dweling time for most of the exporting container ships is quite short. 80% of them spent only one day, and just 20% of them spent two until three days. It shows that the export container ships can move more smoothly through the port compared to importing container ships.

Figure 5.2.1 Import/Export Container Dwelling Time



Source: JICA Study Team

b. Operating and Processing Speed

Ship Entry Documents: Majority of shipping companies noted that "ship entry documents process runs smoothly".

Misplacement of Containers at CY: More than half of the companies answered "once a year" or "never before" when asked of their experience in misplacement of containers at CY. However, there were 20% of container shipping companies and 29% of B/BB shipping companies answered "once a month".

Table 5.2.2 Misplacement of Containers at CY

		Shipping Company (Container)	Shipping Company (B/BB)
Misplacement of containers at CY	Once a week	0%	0%
	Once a month	20%	29%
	Once in 6 month	10%	14%
	Once a year	30%	29%
	Never before	40%	29%
	Total	100%	100%

Source: JICA Study Team

Productivity: The answers on crane productivity for container cargo fluctuates by shipping companies. However for break bulk and bulk cargo, it seem that existing productivity is satisfactory.

Table 5.2.3 Productivity by Cargo Type

Crane Productivity For Containers		B/BB Cargo	Break Bulk Cargo	Bulk Cargo
Less than 20 boxes	33%	Less than 100 tons	0%	0%
20 - 25 boxes	5%	100 - 200 tons	0%	0%
25 -30 boxes	29%	200 - 300 tons	8%	0%
30 boxes or more	33%	300 tons or more	69%	100%
Total	100%	Total	100%	100%

Source: JICA Study Team

c. Port and Trade Related Payment

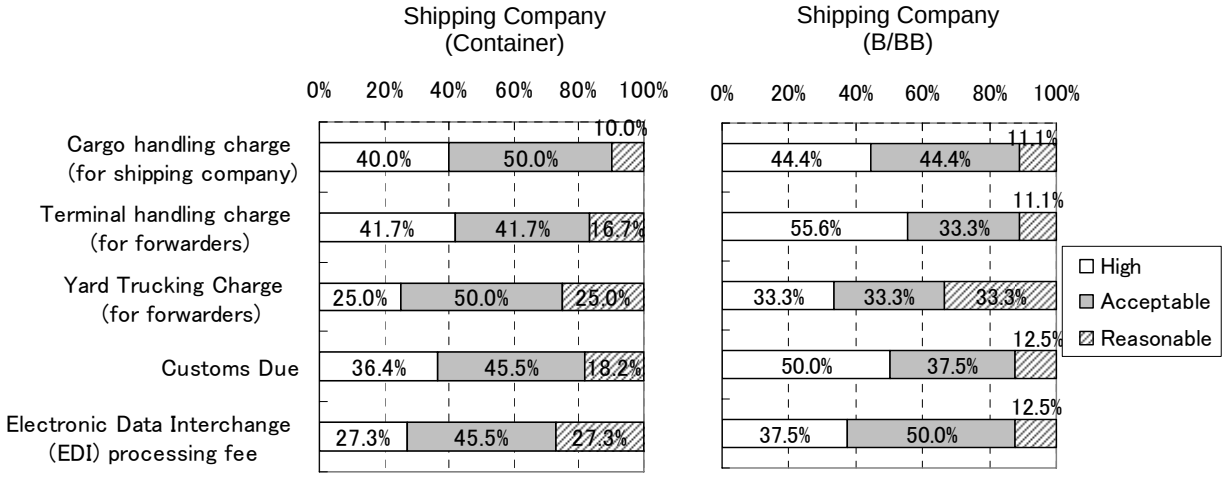
Port and Trade Related Payment: Almost a half of B/BB shipping companies answered 'high' when asked about terminal handling charge, however 44.4% answered 'acceptable' and additionall 1.1% of the companies answered 'reasonable'.

Thereby, the port related payments are not relatively high, however the companies noted that longshoremen usually start to work late and finish early due to historical custom. That causes shipping companies to bear costs that are more than they expect.

Furthermore, there are a lot of related people involved in the cargo handling procedures and that they must bear some invisible costs at various situations.

Shipping companies say that they will willingly pay reasonable costs for reasonable services .It is however very important to consider who will bear the costs for infrastructure improvement cost.

Figure 5.2.2 User's Satisfaction for Port and Trade Related Payments

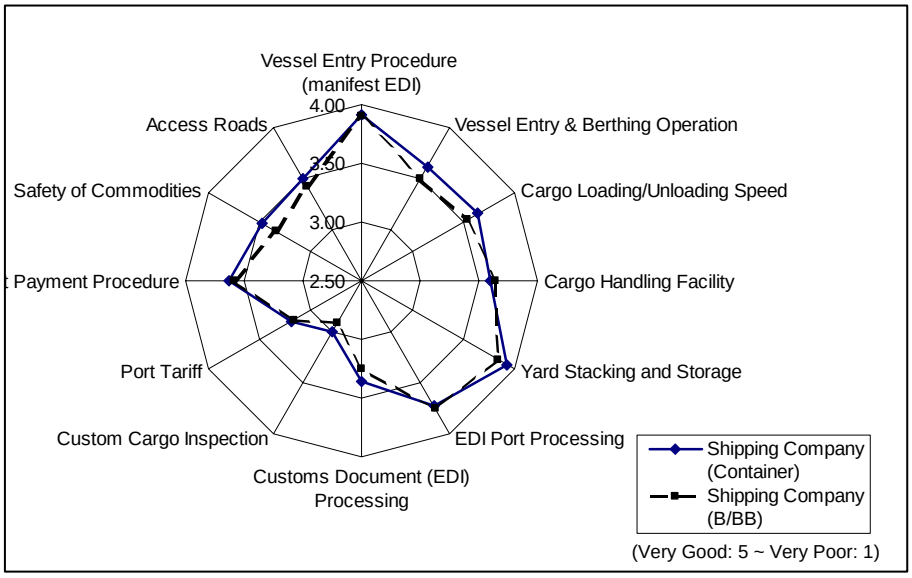


Source: JICA Study Team

d. Evaluation of the Service in Tg.Perak

Evaluation of the Service in Tg.Perak: Figure 5.2.3 shows the evaluation of service of Tg. Perak compared with other ports using a five-point evaluation score. The evaluation value of custom inspection is significantly worse than the other factors, because 38% - 42% of shipping companies graded it as poor. The customs document processing and port tariff are also worse than other factors. Nevertheless, the services in other areas are not so bad if compared with other ports. Similar trends in Container shipping companies and B/BB shipping companies are observed.

Figure 5.2.3 Evaluation of the Service in Tg.Perak Compared with Other Ports



Source: JICA Study Team

Table 5.2.4 Dissatisfaction Ratio for Each Factor

	Shipping Company (Container)	Shipping Company (B/BB)
Vessel Entry Procedure (manifest EDI)	-	-
Vessel Entry & Berthing Operation	-	-
Cargo Loading/Unloading Speed	-	-
Cargo Handling Facility	-	-
Yard Stacking and Storage	-	-
EDI Port Processing	-	-
Customs Document (EDI) Processing	-	-
Custom Cargo Inspection	38%	42%
Port Tariff	13%	17%
Port Payment Procedure	-	-
Safety of Commodities	5%	7%
Access Roads	6%	7%

Source: JICA Study Team

e. Urgent Matters to be Improved

Figure 5.2.5 illustrates a summary of the opinion of shipping companies on urgent matters that need to be improved in Tg. Perak. Users' expectation can be separated into four groups: infrastructures, systems, costs and safety. Among them, the items which a lot of users are expecting to be urgently improved are showed as follows.

Table 5.2.5 Four Groups User's Expectations

(1) Infrastructure	(2) Systems	(3) Costs	(4) Security
a. Old facilities b. Berthing space is not enough c. Road outside the port area d. depth of channel		a. Invisible costs	1. Port security

Source: JICA Study Team

Detailed comments from shipping companies on the major issues above are as follows:

i) For berthing space, issues on the condition of berths, the length and depth are all considered requiring immediate attention.

ii) Another critical issue is 'the old port'. Tg. Perak Port which is almost 100 years-old. Most terminals, except Mirah Terminal, have been unchanged, while containerization is increasing. Container cargo handling need wider spaces than usual cargo handling system, therefore, many shipping companies desire wider spaces at the conventional terminals. Channel is another big problem, not only its shallow depth, but also its narrow width. Some parts of channel are not wide enough for two-way sailings. As the channel is not deep enough for some ships, those ships must wait for high tide to enter the port.

iii) Tg Perak Port has good access road connection, but many port users think that access road is also very important infrastructures for port activities and therefore needs to be further improved.

iv) Most users claim unreasonable costs during customs cargo inspection and cargo handling especially at conventional terminals. Some users say that the tariff here is more expensive than other countries.

v) Most of users think the security system at the land area is rather good, but that of at the water area is not good. When ships are waiting for berthing at the anchorage area at night, their ship cargos and equipments are said to be stolen sometimes.

In order to further understand the current port problems more specifically, consultations was done with 10 shipping companies. The result is showed on Table 3.5.6.

Most shipping companies worry about inadequate navigation aid system/facilities and insufficient access channel for navigation. The water area between Buoy No. 5 and Buoy No. 7 is said to be very dangerous for navigation and the area around Buoy No. 2 is very narrow. The lights of those critical buoys sometimes do not work well or are dead.

There are also claims against pilot and tug services. It is said that it sometimes takes a long time for the pilot to arrive and get on a ship. It causes shipping company to incur avoidable cost. During high wave conditions some pilot boats do not have enough capacity, so a pilot cannot board the ship sometimes. Furthermore, tug boats in use are of small capacity that large ships that require strong tug boats experience problems in navigation.

Most of shipping companies say that the access channel should be always kept -9.7m as is publicly announced. However, shipping companies have to keep their ship's draft to be less than -9.7m, because deeper drafts would require their ships to wait for high tide. Moreover, some parts of the channel are only capable of one way traffic, and this especially affects large ships.

As for berthing facilities, there are not many complaints against the international container terminals except for expensive handling charges, but the same could not be said of the interisland terminals. Full-container ships have gradually become popular mode of transportation for interisland transport, but still a lot of semi-container ships and conventional ships play a large part of the transportation, because they are more economical transportation mode than container ships under certain conditions. Particular comments on interisland container berth are as follows:

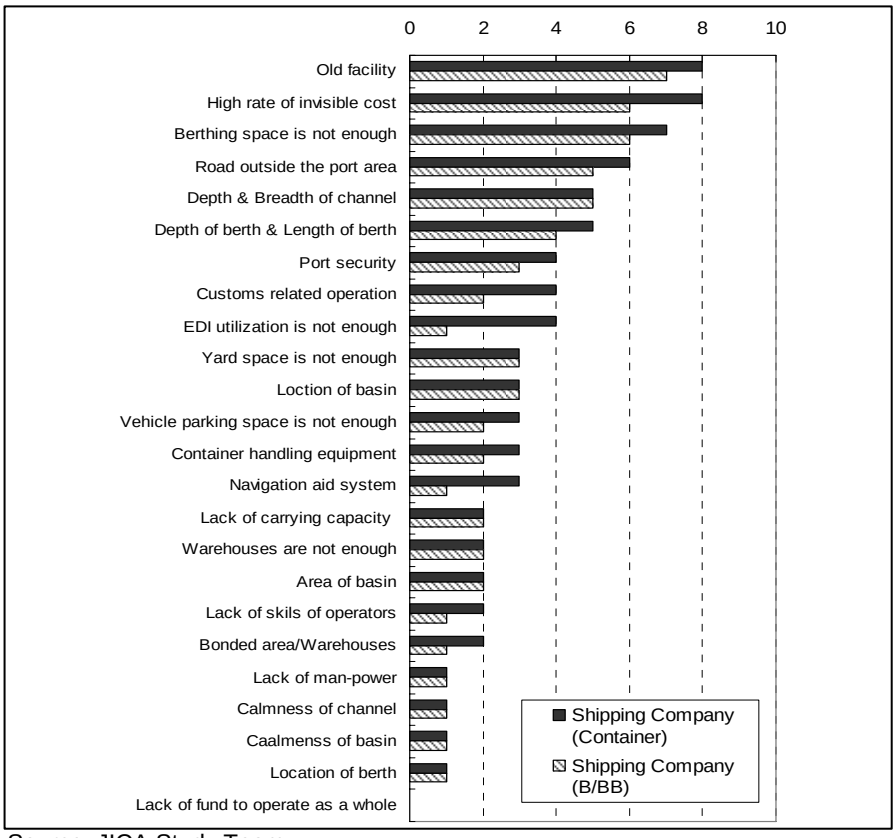
i) Some shipping companies say that Jamrud terminal has necessary depth for those ships, and its berth length is 1200m long. However, since 500m of the berth is used for passenger ships; only 700m is available for cargo ships – thereby sometimes ships have to wait for a berth and because. Jamrud terminal congested cargo handling efficiency is rather low.

ii) TPS has a 500m long berth for interisland container ships but half of it is very shallow due to sedimentation so some shipping companies have already cancelled some of their ship calls at TPS because of lack of interisland container berths.

iii) One of the major carriers points out that TPS should do their best to improve their cargo handling efficiency. The standard handling rate is 40 boxes/hour, but TPS's current operation is only 35 boxes/hour. It is observed to be because of the long distance between the berth and the terminal.

With regard to the EDI system, there are not so many comments on the TPS system. Some users say that it will be better if users can get the information about their cargo movement in the terminal, such as arrival and departure time of their cargos. On the other hand, there are a lot of complaints against customs processing. The EDI system for customs processing has just started several years ago and the system for import cargos has improved gradually, but export movements still have a lot of problems. However, if the EDI system gets on the right direction, the invisible cost problem will be minimized.

Figure 5.2.4 Urgent Matters to be Improved



Source: JICA Study Team

Table 5.2.6 Bottlenecks at Surabaya Port

Items		No. of Answers	Comments
Navigation Aid System		9	• Sometimes No2 and No5 buoy lights do not work. They are not repaired at once. Straight channel is better.
Channel	Depth	7	• Current Depth -10.5m should be always maintained. • Desired depth is -12m.
	Breadth	6	• Narrow channel causes ship's delay and ship accidents. • Expected width is to allow 2 way navigation.
	Calmness	1	• Outer channel is not good during monsoon time.
Basin	Location	3	• Sometimes a pilot cannot board from a pilot boat to a ship.
	Area Size	1	• Inner anchorage area is not enough for waiting ships.
	Calmness	1	• Current speed is rather fast, so sometimes anchoring ships drift during strong wave.
Berth	Location	1	• TPS location is good. Half of interisland terminal of TPS cannot be used because of its shallow depth.
	Length	2	• Total length of conventional terminal is not enough for demand. • Some shipping companies have already cancelled some of their ship calls at TPS because of lack of available berths with necessary depth
	Depth	2	• Depth of conventional terminal is not enough for international/interisland ships.
Container Handling		2	• Handling speed is a little bit slow than users' expectation.
Vessel Operation		4	• Piloting service is not good and sometimes capacity of tug boat is enough for a large ship.
EDI System		5	• Vessel entry procedure is rather good. EDI system of customs clearance does not work well.
Port Security		1	• Port security of land area is good, but that of water area is not good. Sometimes commodities and equipments are stolen at anchorage area at night.

Source: JICA Study Team

2) Assessment from Forwarders

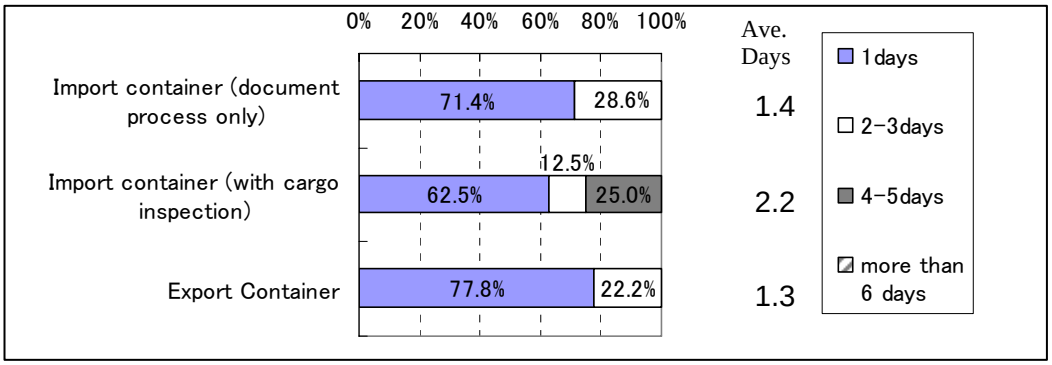
The total number of forwarding companies forming the Forwarder Association of Surabaya is around 300. Of these 220 companies exclusively work for the customs clearance and 20 companies are international companies. Forty-four companies exclusively work for air cargo. This means that the number of forwarding companies handling of sea borne freight is only 36, which includes 20 international companies. Most of the forwarders are concentrated in the SMA because of the international container terminal and international airport.

To analyze the user's satisfaction of Surabaya port from a freight forwarder's point of view an interview survey. was conducted with a total of 32 responding forwarders. The following are the salient results of the survey.

a. Time in Port

Container Dweling Time (Import/Export Permission): Figure 5.2.5 illustrates the import/export container doweling time based on the interview survey. For an imported container with cargo inspection, a quarter of the forwarder answered from four to five days, and the longest time for an imported container with document process only is 2-3 days. Meanwhile, exported container requires only 2-3 days at the maximum and most of them can be handled in one day.

Figure 5.2.5 Import/Export Container Dwelling Time



Source: JICA Study Team

b. Operating and Processing Speed

Ship Entry Documents: Majority of shipping companies said "ship entry documents process runs smoothly".

Misplacement of Containers at CY: A quarter of forwarders answered that they experience misplacement of container at CY once a week and a quarter of forwarders experience the problem once a month. However the other 50% experienced mislocated containers much less frequently or never.

Table 5.2.7 Misplacement of Containers at CY

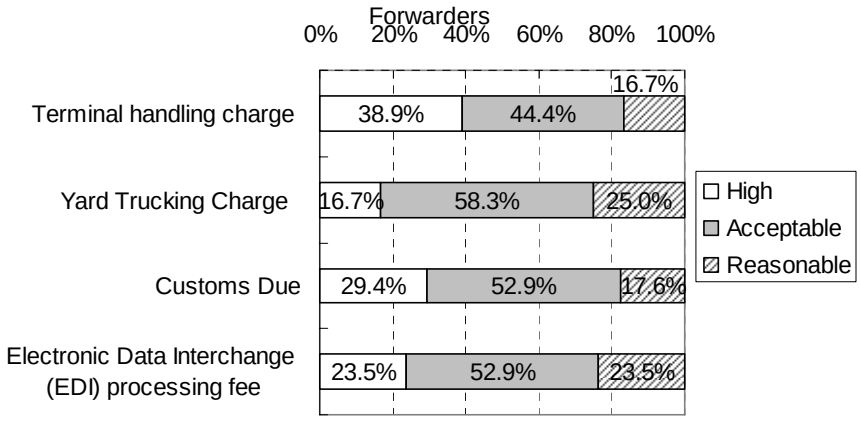
Frequency		Forwarders
Misplacement of containers at CY	Once a week	25%
	Once a month	25%
	Once in 6 month	6%
	Once a year	19%
	Never before	25%
	Total	100%

Source: JICA Study Team

c. Port and Trade Related Payment

Port and Trade Related Payment: Overall, three out of four forwarders commented it to be acceptable or reasonable. Meanwhile, 38.9% of forwarders said terminal handing charge is high.

Figure 5.2.6 User's Satisfaction for Port and Trade Related Payments

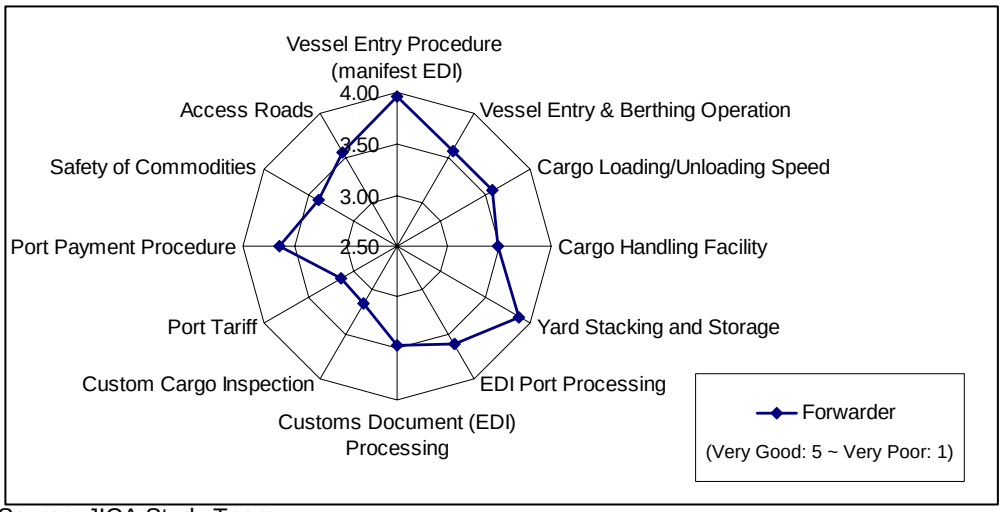


Source: JICA Study Team

d. Evaluation of the Service in Tg.Perak

Evaluation of the Service in Tg.Perak: The figure shows the evaluation of the service in Tg. Perak compared with other ports using a five point scale. The evaluation value of custom inspection and port tariff is significantly lower than the other factors. The customs document processing and port tariff are also lower than the other factors. This is a similar assessment as that of the shipping companies.

Figure 5.2.7 Evaluation of the Service in Tg.Perak Compared with Other Port



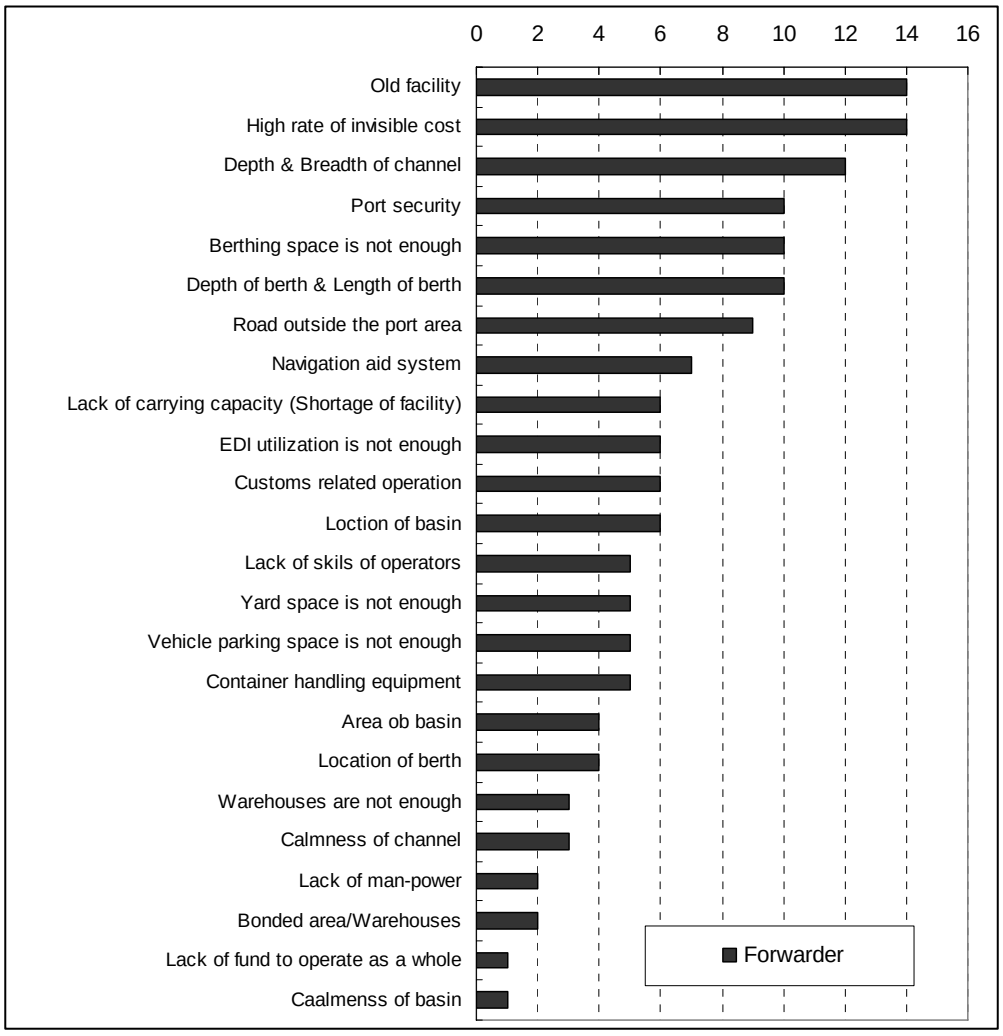
Source: JICA Study Team

e. Urgent Matters to be Improved

Figure 5.2.8 illustrates the summary of opinion of forwarders regarding urgent matters that need be improved at Tg. Perak. Primarily, forwarders are not satisfied with old facilities,

invisible costs and channel. In addition, there are issues that have been brought up regarding r berth space. The results mirror that of the shipping companies.

Figure 5.2.8 Urgent Matters to be Improved



Source: JICA Study Team

5.3 Port Business and Investment

1) Financial conditions of Pelindo III

Based on published financial statements, PELINDO III as a State-Own Enterprise shows good performance financially.

Balance Sheet: The amount of current asset is influenced by the turnover from operation and decreased in 2003, but since then, the current assets is making a steady increase. Fixed asset and total asset grew by nearly 9 % and 5% per year respectively over the past 5 years.

Profit and Loss: Operational revenue of PELINDO-III is making a steady increase in the past 5 years by a rate of 10% per annum. However, operating expense has also increased every year especially in 2003. As a result, income amount dropped in 2003 but during the past 5 years, profit before tax has grown at a rate of 3% annually.

Table 5.3.1 Balance Sheet of PELINDO III (Consolidated)

(Million Rp)

	2002	2003	2004	2005	2006
Current Assets	679,489	575,834	718,175	933,277	1,164,921
Investments	6,546	8,370	8,286	9,471	10,776
Fixed Assets	1,684,960	1,666,561	1,725,632	1,973,677	1,911,847
Other assets	172,964	251,916	227,814	169,943	251,347
Total Assets	**2,543,958**	**2,502,681**	**2,679,907**	**3,086,367**	**3,338,890**
Total Short Term liabilities	266,479	258,819	259,725	320,146	365,000
Deffered Tax Liabilities	**33,034**	**40,242**	40,228	50,131	**79,207**
Long-term liabilities	222,211	170,357	437,695	722,999	557,805
Minority Interest	185,364	194,177	227,103	203,029	210,567
Share Capital	525,000	525,000	525,000	525,000	525,000
Government participation	284,222	284,222	284,222	284,329	463,942
Retained Earnings	1,027,648	1,029,864	905,935	980,733	1,137,369
Total shareholders' Equity	1,836,870	1,839,086	1,715,157	1,790,062	2,126,311
Total Liability and Equity	**2,543,958**	**2,502,681**	**2,679,907**	**3,086,367**	**3,338,890**

Source: Financial Statements, PELINDO III

Table 5.3.2 Profit & Loss Statement of PELINDO III

(Million Rp)

	2002	2003	2004	2005	2006
Gross Sales	1,311,218	1,386,463	1,513,267	1,696,319	1,785,047
Reduction	(10,685)	(2,576)	(10,398)	(3,192)	(2,428)
Net Sales	1,300,533	1,383,887	1,502,870	1,693,128	1,782,619
Operating Expense	(649,383)	(827,939)	(896,325)	(994,452)	(1,130,165)
Operating Income	**651,151**	**555,948**	**606,545**	**698,676**	**652,454**
Miscellaneous Sales	49,945	25,088	30,931	47,886	47,948
Miscellaneous expense	(47,112)	(92,428)	(16,584)	(22,330)	(89,398)
Miscellaneous Income	2,833	(67,340)	14,347	25,556	(41,450)
Profit bef. interest & Tax	**653,983**	**488,608**	**620,892**	**724,232**	**611,004**
Interest expense	(5,648)	(3,852)	(2,644)	(3,263)	(875)
Assignment cost	(177)	(8,162)	(6,459)	(7,945)	(11,915)
Extra ordinary items	0	0	0	0	(381)
Income bef. Tax Expense	**648,158**	**476,594**	**611,789**	**713,025**	**597,833**
Tax Expense	(170,601)	(153,043)	(193,114)	(235,056)	(207,045)
Minority Interest	(119,275)	(101,565)	(130,175)	(136,205)	(121,639)
Net Income to Shareholders	**358,282**	**221,987**	**288,500**	**341,764**	**269,149**

Source: Financial Statements, PELINDO III

In spite of healthy growth of business, PELINDO III has experiencing difficulty in achieving annual target in terms of revenue and business profit. Matters and reasons that influence income achievement are as follows:

a) Continuation of decline of industry, especially in East Java and Central Java;

b) Significant increase of fuel price;

c) Government decision to reduce container handling tariff (CHC) since 1 November 2005 ;

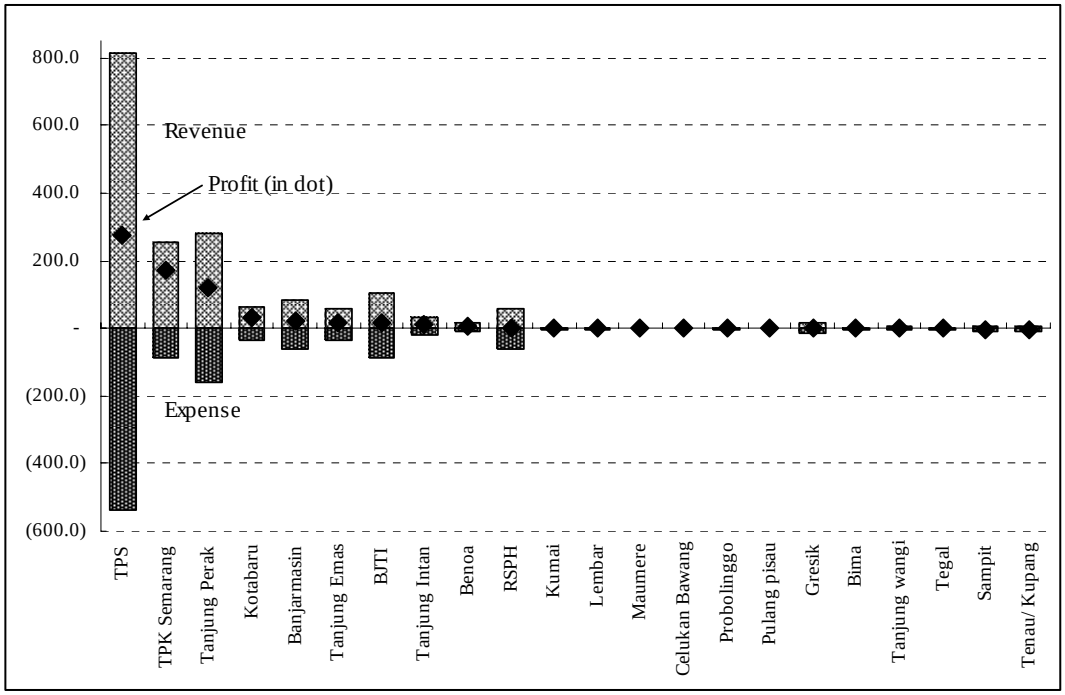
d) Collision of conveyor in IBT and Kotabaru Stagen Berth, decreasing income opportunity of around 10 billion rupiah in 2005;

e) The Container Crane (CC) damage in TPKS resulted in 3 billion rupiah loss of income;

a. Profitability by Branches and Business Units

Revenue from TPS is outstanding as it records 800 billion rupiah and the profit amounts to nearly 300 billion. Both revenue and profit mark steady growth in the past several years. Together with the container terminal in Semarang, the revenue from these container terminal amounts to nearly two thirds of total revenue of PELINDO III. Actual account of each branch and port is given in the table below. It can be clearly said that the financial impact of container terminal is outstanding.

Figure 5.3.1 Financial Performance by Ports of PELINDO-III (2005, in billion Rp.)



Source. Financial Report 2005, PELINDO-III

Note: Profit is indicated by diamond dot calculated by Revenue minus Expense. There are some deviations in figures of branches because of transaction between head office is not fully net accounted yet.

Table 5.3.3 Financial Performance by Ports of PELINDO III

Ports (Business Unit)	Revenue (mil Rp)	Cost (mil Rp)	Profit (mil Rp)
TPS	814,089	540,395	273,694
TPK Semarang	255,811	85,137	170,674
Tanjung Perak	281,777	160,755	121,022
Kotabaru	64,211	33,330	30,881
Banjarmasin	83,409	63,313	20,096
Tanjung Emas	55,408	36,576	18,832
BJTI	102,701	88,998	13,703
Tanjung Intan	29,717	17,475	12,242
Benoa	14,146	10,507	3,639
RSPH	59,772	9,088	684
Kumai	2,951	2,819	132
Lembar	2,400	2,593	-193
Maumere	1,529	1,755	-226
Celukan Bawang	1,242	1,486	-244
Probolinggo	3,013	3,422	-409
Pulang pisau	284	1,082	-798
Gresik	13,831	14,770	-939
Bima	988	1,999	-1,011
Tanjung wangi	4,985	6,532	-1,547
Tegal	1,128	2,853	-1,725
Sampit	4,261	8,004	-3,743
Tenau/ Kupang	6,545	11,688	-5,143

Source : Financial Report 2005 PELINDO III
Note: Because of inclusion of 3 business units in Tg Perak, and lack of off-setting information between the central office and these units, information of central unit is omitted from this table.

Among these 22 business units, half of them are making profit and the rests are operating at loss. However, the amount of profit from the former half is very large to cover the loss from the latter. The total balance of PELINDO III is resulting in a good amount of profit.

2) Investment Activities

The business climate of year 2006 is not as bright as previous years, therefore, in the Stakeholder Meeting (RUPS) it has been approved to revise income and profit targets and it is predicted to decrease. However, PELINDO III Management will not continue to invest in order to increase service and maintenance for existing facility and equipment. Such decisions is made based on consideration of growth of cargo and shipcall in the future.

In the year 2006, PELINDO-Ill conducted various facility developments, with investment allocation of 311.8 billion rupiah, while it finances facility development and improvement in priority branch ports. 115.0 billion rupiah will be invested to the continuing projects from the previous year, and new projects are 196.8 billion rupiah.

Development and improvement of PELINDO III facility for year 2006 covers the following:

i) Tanjung Perak Branch, undertakes work for west channel entering Tanjung Perak, entrance gate arrangement to port areas, development of dolphin mooring, improvement of caisson Jamrud berth, ship docking, and channel dredging of buoy 5-7;

ii) Semarang Container Terminal Branch (TPKS), Container Crane (CC) purchase, and road leveling of West and East Coaster;

iii) Tanjung Emas Semarang Branch, procuring of pilot and tug boat and breakwater reparation;

iv) Banjarmasin Branch: development of pilot station, basin dredging, ship docking

As for dredging, PELINDO-III spends approximately 20 billion Rp every year for maintenance dredging at the following ports.

Table 5.3.4 Maintenance Dredging Cost by PELINDO-III (Mil Rp)

	2005	2006	Average
Tg. Perak	**4,586**	**4,527**	**4,556**
Tg. Emas	1,558	229	893
Banjarmasin	1,751	0	876
Tg. Intan	1,467	1,434	1,450
Gresik	**1,794**	**994**	**1,394**
Tg. Wangi	616	616	616
Sampit	2,849	2,849	2,849
Tegal	1,371	1,301	1,336
TPKS	4,694	8,046	6,370
Total: Annualized Maintenance Dredging Cost	**20,686**	**19,995**	**20,340**
Maintenance Cost in the Surabaya DLKR	**6,380**	**5,520**	**5,950**

Source: PELINDO-III Financial Division

In addition to these dredging work, central government orders PELINDO-III to conduct dredging work outside the responsible area.

Regarding Tanjung Perak west channel dredging, the DG Port & Dredging asked the Ministry of State-Own-Enterprise (BUMN) to conduct the dredging work to be done by PELINDO Ill. The cost was all shouldered by PELINDO-III, even though the expenses was supposed to be regarded as advance payment and deducted from the dividend to the government. In the financial report of PELINDO-III in 2006, the expenditure of dredging at DLKP was recorded as "Government responsibility shouldered by PELINDO-III" (Biaya Penugasan) in the amount of approximately 9 billion Rp.

The central government has annual dredging schedule which covers entire country and requires 126 Bil Rp. every year.

Table 5.3.5 Dredging Schedule by the Central Government in 2007

	Area	Volume (m^3)	Total Cost (Mil Rp)	Requested by
1	Jawa Timur: Pasuruan	250,000	3,864	PELINDO-III
2	**Jawa Timur: Surabaya**	1 Package	**20,000**	PELINDO-III
3	Jawa Timur: Brondong	325,000	5,030	
4	Jawa Timur: Kalbut	100,000	1,590	
5	Jawa Tengah: Juwana	380,000	5,898	
6	Banten: Karangantu	125,000	1,951	
7	NAD: Lhok Seumawe	500,000	6,663	PELINDO-I
8	NAD: Kuala Langsa	350,000	4,664	PELINDO-I
9	Jambi: Muara Sabak	300,000	4,910	PELINDO-II
10	Jambi: Kuala Tungkal	300,000	4,910	PELINDO-II
11	Sumatera Selatan	1,250,000	16,656	
12	Bangka Belitung	150,000	2,424	
13	Bangkulu	500,000	6,663	
14	Kalimantan Barat: Polon/Sekua	280,000	4,619	
15	Kalimantan Barat: Kendawangan	150,000	2,504	
16	Kalimantan Barat: Ketapang	400,000	6,363	PELINDO-II
17	Kalimantan Timur: Samarinda	1,000,000	13,325	
18	Kalimantan Tengah: Sampit	700,000	9,328	PELINDO-II
19	Sulawesi Tengah: Leok	250,000	4,606	
	Total		**125,965**	

Source: DG Port & Dredging

There is another government cost shouldered by PELINDO-III, which is one unit of Patrol Boat, purchased by PELINDO-III and used by ADPEL. Because the boat is listed as one of the assets in PELINDO, depreciation in the amount of 83 million Rp is accounted for in the expense item

3) Estimated Port Investment Capability

Judging from the financial condition of PELINDO-III, investment potential is high and possible to make new infrastructure investment.

The following cash-flow statement shows sound and sufficient cash inflow for the new development. For Example, Teluk Lamong Project expects a contribution of PELINDO III in the amount of 300 billion Rp. The Ending cash balance in 2006 is nearly 900 billion Rp. So the contribution would be easy and even possible to shoulder the portion of local government for infrastructure development.

Table 5.3.6 Cash-Flow Statement of PELINDO-III (Rp Million)

	2005	2006
Cash Beginning	357,663	683,924
Operational Cash Inflow	1,286,006	1,247,828
Non-Operational Cash Inflow	955,853	1,549,428
Total Cash Available	2,599,522	3,481,180
Operational Cash Outflow	631,425	912,630
Investment on Routine work	71,911	283,675
Loan to outside	63	1,677
Non-Operational Cash-Outflow	1,212,200	1,392,704
Total Cash Utilized	1,915,598	2,590,685
Cash Ending Balance of the year	**683,924**	**890,495**

Source: Financial Statements, PELINDO III

4) Lessons Learned

There are two typical port developments which will make good contrast for the methodology of development. Development of TPS was supported by international development Loan and leased to privatized subsidiary company with participation of private terminal operator. So the fixed asset is still at hands of PELINDO-III. Development of TPS was successful in the sense that PELINDO-III developed container terminal without exchange risk of the international loan and, later on, it was able to afford to expand the terminal by the own fund. Privatization and private investment by terminal operator was successfully realized and has established reputation for efficient terminal operation now.

In the case of Bojonegara, from the very beginning of infrastructure development and procurement of land, private participation was anticipated. Negotiation is reported to be underway during the year 2007. Project risk including marketing and political instability still remains to be large unless liberalization were realized as to investment and entry of foreign companies.

Case 1: Development and Privatization of Terminal Petikemas Surabaya (TPS)

TPS was planned by PELINDO-III in 1984 and started construction with ADB loan at total equivalent amount of 275.9 billion Rp. The loan consists of four units of slightly different components exhibited in the table below. PELINDO-III had a subsidiary loan agreement with GI

to repay in rupiah for the original amount. PELINDO-III receives dues based on tariff in dollar from international cargo and vessel. Therefore repayment was easy for PELINDO-III, but the Government suffered from the repayment by US Dollar later. Two ADB loans were used for infrastructure development and other two loans such as Saudi Fund (SFD) were used for the procurement of equipments.

Table 5.3.7 Composition of Loan to PELINDO-III for the Development of TPS

	ADB 797 SLA.164/DDI/1984 Nov 27	ADB 688 SLA.343/DDI/1987 Oct. 21	SFD SLA.321/DDI/1987,June 24	NIB SLA.347/DDI 1987
Amendment	AMA92/SLA-164/DDI/1989			
Final Amendment by SK Mentari Keuangan	Sub-Loan No. S – 67/MK.02/1996, Feb 12	Sub-Loan No. S – 67/MK.02/1996, Feb 12	Sub-Loan No. S – 67 MK.02 /1996, Feb 12	Sub-Loan No. S – 67 MK.02 /1996, Feb 12
Loan Amount US$	**93,632,496**	**26,300,000**	**20,230,000**	**10,800,000**
Equivalent in Rupiah	**171,860,631,785**	47,758,580,816	**36,735,973,000**	**19611888700**
Grace Period	5 years	5 years	4 years	5 years
Repayment aft g-period	20 years	20 years	16 years	20 years
Interest rate	10.50%	10.50%	10.50%	10.50%
Commitment fee	0.75%	0.75%	0.75%	0.75%
Handling charge	0.25%	0.25%	0.25%	0.25%
Repayment Start	Apr-93	Apr-93	Mar-93	Apr-93
Total Loan amount	**150,962,496**	**USD** which is equivalent	**275,967,074,300**	**IDR**

Note. Exchange rate was 1,835 Rp/USD for ADB 797, 1,816 Rp/USD for other three loans.
Source. Financial Report, PELINDO-III

The terminal started operation in 1992. With this successful experience of development, management of PELINDO-III must have thought of additional developments. Those were extension of TPS terminal and development of the second container terminal at Lamong bay. It became clear that container terminal operation was a lucrative business.

PELINDO-III started to expand the TPS quay length from 500 meter to 1,000 meter in 1998. The extension was estimated to be 340 billion Rp equivalent of 38 million USD by the investment of PELINDO-III own fund. The extended 1,000 m quay has served since 2002.

In the mean time, the privatization of PT TPS was made on April 30, 1999 by dividing assets from Container Terminal Unit (UTPK) to both PT.TPS and PELINDO-III. Total Fixed Asset at Acquisition Value was 367.8 billion Rp. Among them, port facilities, land, road and buildings were left at PELINDO-III with total value of 257 billion Rp. Whereas cranes, machinery and trailers were transferred to PT. TPS with total value of 110 billion Rp.

Table 5.3.8 Division of Fixed Asset at Privatization of PT TPS (as of April 30, 1999)

	Unit Container Terminal (before Privatization)	PT.TPS (mil Rp)	Pelindo-III (mil Rp)
Port Facility	146,825		**146,825**
Port Cranes	94,317	**93,855**	462
Installation	14,747	**14,747**	
Land	57,968		**57,968**
Road and Building	42,086		**42,086**
Machinery	1,929	**1,916**	13
Trailer Head and Chassis	98	**92**	6
Emplacement	9,912		9,912
Total Fixed Asset (Original)	**367,883**	**110,610**	**257,273**
Accumulated Depreciation	25,517		25,517
Book Value	342,366	110,610	231,756

Note. Exchange rate at the time of Privatization was 8,685 Rp/USD.
Source. Financial Report, PELINDO-III

Soon after the privatization, in May 1999 after negotiation with several private companies, P & O Australia agreed to purchase 49% of shares of PT. TPS at a cost of 173 million USD. Original intention of P&O was to provide good feeder service keeping up with the economic growth of East Java. Total asset at the time of sales of share was 127.8 billion rupiah which was equivalent of 70 million USD by the exchange rate at the time of loan to develop the terminal. Currently P & O, now DP World, receives dividend at the estimated rate of 7 to 8 % of the investment annually.

Based on the Lease Agreement with the PELINDO-III, PT. TPS pays the following every year.

a. Lease payment of 2.8 million USD for the rental of 837.520 square meters of port area. Payment is made every 6 months during the contract period of 20 years.

b. Contribution or royalty of managing container terminal according to the Authorization Agreement in the amount 10% of gross sales are to be paid every 6 months during the contract period of 20 years.

c. Retainer fee based on the technical service agreement since June 22, 2004 for 5 years. The tariff ranges from USD 470 to USD 750 per man days for the services including advice, recruitment, survey and operation analysis.

After P&O was taken over by Dubai Port World in 2006, the terminal has being operated continuously for both the private investor and PELINDO-III.

Case Study – 2: Bojonegara New Port Development

The Bojonegara Development as an international trade port was recommended by the relevant JICA port study completed in 2004 and planned by PELINDO-II, then approved by the government as one of the first PPP Projects in Indonesia. Even though it might be premature to discuss, the outline of project is hoped to provide us with some insights in the aspect of private participation.

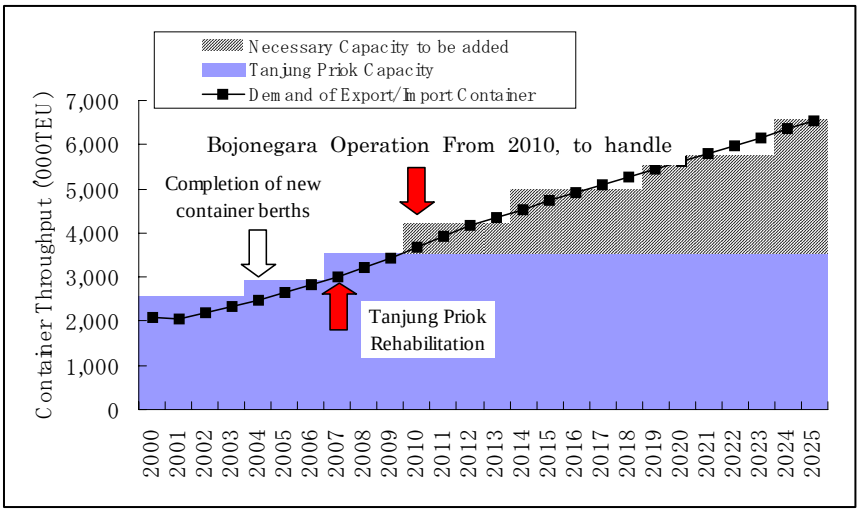
The Bojonegara New Port is planned as complementary twin international trade port of Tanjung Priok to be ASEAN Regional Hub ports considering the following aspects:

- spatial constraints for new development in the existing Tanjung Priok Port and huge cost for new development outside Tanjung Priok Port,

- avoiding intensive concentration of cargo traffic especially large container trailers on the roads of the metropolitan area, and contribute as strategic logistic infrastructure for national and regional development of Banten Province.

New Bojonegara Port is planned to handle mainly international containers. The forecast of international container traffic have been worked out considering the national and ASEAN, regional economic growth by investment, potential growth of manufacturing products, and export/import automobiles with related industrial in the hinterland of Tanjung Priok Port, i.e. the provinces of Banten Province, Jakarta and West Java. Out of the forecast of container cargo volume, the exceeded volume to be reached by 2008, beyond the capacity of Tanjung Priok Port is allocated to handle through Bojonegara Port.

Figure 5.3.2 Demand and Capacity of International Container at DKI Jakarta, West Java and Banten



Source. The Study for Development of Greater Jakarta Metropolitan Ports, JICA, 2004 January

Based on the analysis of optimum balance of the traffic demands and development capacity of port facilities, the required berthing facilities for 2025 of the master plan is estimated 8 container berths and in 2012 of the short term plan is estimated 2 container berths and one (1) multipurpose berth which shall be made operational in 2008.

Investment amounts are estimated in the following infrastructure. The tender process is underway and the result will be announced when the negotiation is settled.

Usually in a project of this kind, Government responsibility is listed to build infrastructure such as “Breakwater” “Channel Dredging” “Access Road” and “Railway construction”. However in the recent lack of government budget, these items are also expected to be covered by the private investment.

In order to ensure the cargo amount for the New Bojonegara Port, hinterland development was planned and industrial estate is planned to be simultaneously developed. Then, land acquisition becomes one of the issues for the development. Generally land acquisition is one of the basic responsibilities of the government. The land price was 20,000 Rp/m^2 in 1994 but after the project was announced, the price soared to 83,000 Rp/m2 in 2005. Therefore it is not easy to purchase land by the budget of the regional government. Procurement of land and development to make industrial estate is included in the item of the private investments, but it may take time that the government and private investors agree to a condition both feels satisfied as to the balance of responsibility and benefit.

Investment tends to become too large so that the risk premium is also large. Feasibility of the investment might never meet to the criteria of private investors. In this occasion, international investors have options to move to other country. But on the other hand port development is tied to the land and constraints of regulations. PPP scheme sounds attractive to the government side but often it will delay the schedule of development and thereby cause a slow-down of economy.

Figure 5.3.3 Future Bojonegara Development View (2015)

Source: The Presentation document for the Indonesian Infrastructure Conference and Exhibition, Dep of Transportation 2006

Cost estimation is difficult for the land purchase and road construction. Breakwater and Channel Dredging is difficult too, because the volume of underwater condition and unit price is uncertain and easy to inflate when the project starts and demand increases.

Based on the interview to officers of PELINDO-II, cost of Access Road construction and Land procurement is added to the estimate made in the JICA study report in 2004.

Table 5.3.9 Preliminary Estimate of Investment for the Phased Construction at Bojonegara

Phase-1

Infrastructure	Land		61		
	Access Road	Total 17km	600		
	Channel Dredging		390		
	Break-water		322		
	Berth	1000 m	200	1,573	
Equipment	Cranes and Machinery		45	45	
	Total Phase-1 investment			**1,618**	**Bil Rp**

Phase-2

Infrastructure	Channel Dredging		260		
	Break-water		214		
	Railway construction		313		
	Berth	2,000m	400	1,187	
Equipment	Cranes and Machinery		90	90	
	Total Phase-2 investment			**1,277**	**Bil Rp**

Phase-3

Infrastructure	Berth	1,200m	240	240	
Equipment	Cranes and Machinery		45	45	
	Total Phase-3 investment			**285**	**Bil Rp**

Note. This is a preliminary calculation based on the interview survey to the officers in PELINDO-II by the consultant for updating the cost estimates of the JICA report for the development of Greater Jakarta Metropolitan Ports in 2004 January.

5.4 Environmental Considerations

1) Biodiversity

a. Biodiversity along the coastal area

Stretching from the northern part of East Java province along the coastal line to the southeastern end of the province and encompassing Madura island across the channel, continues flat land with low-lying mangrove swamps and fishponds. Industrial and residential estates can also be found along the coastal line of Surabaya and Gresik city in between the coastal ecological zones. Common vegetation within the country's bid-diversity rich coastline can be found along the coast, including mangroves, lagoons, sea grasses bed, sea birds and coral reefs etc.

Much of the coastline along the region is fringed with mangroves, which has been supporting many coastal communities, small-scale fisheries as well as industrial fisheries. Mangroves along the coastline act as biological filters and buffers against coastal erosion as repositories of high biodiversity and critical areas, and as spawning and nurseries for many kind of fish, including prawns, crabs, and milkfish etc. In particular, villagers along the coastline of Madura as well as North Gresik regency, being highly dependent on fishing (both aquaculture known as *tambak* or salty water pond and sea fishing) for livelihood, mangroves have long played key roles for their fisheries production and coastal protection. Mangroves trees have been planted along the riverbanks and dikes of the fishpond through a regreening program initiated by the villagers often with the support of the local government.

Although coral reefs are not found along the coastal zones of the study area, they were identified around Karng Jumang area (5-11 km west of Bangkalan district, water depth: 1.5 m, to 6km, near pilot station) through direct observation (based on Technical and Environmental Study against Channel, Sedimentation and Reclamation Phases Performance in Madura, 2001). 15 families and 35 species[1] were found in the area. Among the three sites observed in the area, ratio of live corals varied between 30% and 66% (the water clarity, brightness, salinity etc., was identified to be in a moderate condition at the time). In other areas close by, such as Modung on Kangean island on the utmost eastern Madura, and Pasirputih in Probolinggo district (towards eastern end of the East Java province) and Bawean island, live corals in good conditions can be identified.

The Madura Straits have a specific sediment characteristic—an extremely soft, fluid mud bottom with very high silt content. Mud-dwelling species adapt to this environment with light, flattened shapes or appendages that adhere to the surface of mud. According to Oceanography Research Centre Report, 78 species of those kinds are found in the region.

Crustaceans collected in the Java Sea and Madura Straits identified 17 orders covering 52 genus and 109 species[2].

[1] Indonesia, being a coral diversity center of the world, has 70 families and 450 species of corals.

[2] Portunidae in the Madura has the most (19 species), of which 3 have economic value—2 species of swimming crab (Portunus pelagicus and Charybdis feriatus) and mud crabs (Scylla serrata). Fewer mollusk species live in the Java Sea and Madura Straits. In Indonesia, around 2,000 species of crustaceans have been discovered.

Figure 5.4.1 Ecological Map of the Study Area

Source: JICA study team

b. Anticipated socio-environmental degradation of the coastal area.

Despite the importance of marine ecosystem to global biodiversity and to the country's environment, these resources are often not managed in a sustainable way. Excess resource use often leads to destruction of coral reefs and important associated sea grasses and mangrove ecosystem, depletion of fish stock, water pollution and biodiversity loss. The coastal area in the study area has also been affected by land-based activities. Industrial and urban wastes and runoff containing chemicals have polluted coastal waters and impaired the ecological function of the some of the precious marine biodiversity. Decline in fish catch in the sea is one of the prominent signals of the ecological changes that have taken place over the years. It was confirmed through interviews with the fishermen in the study area in Bangkalan Regency that polluted coastal water had lead to severe decline in fish catch over the years and this is leading to severe decline in fish catch. For example, in Bangkalan, the fisheries production had declined from 31.4million ton in 2004 to 19.4million ton in 2005.

Table 5.4.1 Fisheries Production in Bangkalan Regency (2005)

Year	Type of fishing			Total
	Sea water	Fishpond	Others	
2005	19,381,661	191,761	16,905	19,435,847
2004	22,530,410	14,247,925	53,999	31,425,275

Note: in tons
Source: Bangkalan in Figures (2005)

Small-scale fishing is the occupation of last resort for many people in the region. The average income of coastal fishers is below the average national level. Various studies show that the coastal fishing communities are among the poorest segment of society in the country.

In the view of the linkage between environmental degradation and the socio-economic condition of the coastal communities, it is worth mentioning that those vulnerable local poor people who have limited capacity to explore alternative livelihood or new subsistence needs, are the first to be adversely affected from depletion of biological resources.

2) Marine water pollution

Environmental impacts of maritime transport activities arise in three main areas: (i) environmental degradation caused by oil spills (ii) disposal at sea of ship wastes and (iii) dredging and the disposal of contaminated dredged material.

a. Oil spill

Marine water pollution by oil spill is now of worldwide concern. In most cases, oil penetration into the marine environment occurs during their marine transportation and related activities. This includes tanker operational discharges, drydock discharges, as well as those that take place during loading and unloading operations. Discharge of oil could also occur as a consequence of various types of marine accidents and during refinery and terminal operations. According to PELINDO and KPLP, there has not been any serious oil discharge into the sea in Tg. Perak, only occasional discharge from the ships at the dry docks have been discovered.

b. Maritime accidents

Scarcity and poor maintenance of navigation aids makes transit a trying task As a consequence, ship collisions are relatively frequent in these waters; total of 18 accidents have occurred in the East Java province during the last 9 years, of which “brush” is the mostly frequently occurred accidents (8 times), followed by collision (7 times). The type of ship and the damage of the accidents are not available, however, according to PELINDO and KPLP, no accidents leading to serious human causalities or oil and other hazardous spills have occurred until now.

Table 5.4.2 Maritime Accident Data (between 1999 to 2007)

Type	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Collision			1	1	3		1	1	0	7
Grounding									1	1
Capsize		1								1
Dragged			1							1
Brush	1	6					1			8
Total	1	7	2	1	3	0	2	1	1	18

Source: ADPEL

c. Disposal at sea of ship wastes

Ships calling at the port generate oil wastewater such as bilge water. Other solid and liquid wastes will also be generated by the port community including ships’ crews. As for operation at Tg. Perak, KPLP is handling discharge of oil. For wastes, two waste reception facilities are established to deal with solid wastes at Tg. Perak. They are generated at the port and collected and disposed by a third party company on a daily basis. The water quality at the port is relatively in good condition compared to the provincial standard.

d. Sea-mining and dredging operations

Often, the rearrangement of bottom topography and the other effects by sea-mining or dredging operations can cause changes in the character of the sea bottom as well as flora and fauna etc.

e. Eco-system susceptible to oil pollution

Oil can be carried to considerable depths in the water and be deposited in sediments thereby affecting organisms as much as 20 m below the surface and as a consequence, this can drastically change the composition of existing ecosystem over time. Within the ecosystem along the coastline of East Java, mangroves are said to be extremely vulnerable towards oil pollution so as *tambak* (brackish water fish pond), a traditionally practiced aquaculture (said to be originated in the Eastern Java region) for milkfish and shrimp.

f. Lessons from Precedent Oil Spill Accidents

Below is the case that well illustrates the threat of the oil spill accidents that can lead to huge and immediate disasters at the expense of environment and society.

An oil tanker, chartered by the Philippines' oil refiner PETRON, was carrying 2.2 million liters of oil to the southern island of Mindanao, when it sank in rough waters off Guimaras Island on the 11th of August 2006. It is said that around 200,000 liters of oil leaked from the tanker, contaminating 24km^2 area. The Guimaras Strait is one of the most productive fishing grounds in the country, and also famous for its rich marine resource, which makes it a very popular tourist spot. The oil spill not only damaged the rich marine resource, but also severely affected the lives of the local residents who deeply rely their livelihood on marine resources including fisheries and tourism. As of July 2007, the oil spill have said to have caused damage to over 650 ha of mangrove areas, 20 ha of sea grasses, 100 hectares of coral reefs and 1,000 ha of fishponds along 235km of coastlines. It also socially and economically displaced over 15,000 villagers in the area. It is reported to be the worst oil spill in the country's history. A task force was set up by the government to for the cleanup of the oil spill and the retrieval of the 1.5 million liters or so of oil still remaining inside the tanker. The clean up cost was said to be around 250 million pesos (approx. 5 million USD). Compensation programs through International Oil Compensation Fund as well as PETRON have been set up to assist and compensate the affected people[3], however, not all affected people are said to have been properly compensated. An alternative livelihood program for the affected people as well as "cash for work program" (to engage in cleaning up of the oil-spill affected shorelines) have been implemented by the central and local governments and other donors. The Philippine government is also trying to pass the bill for the establishment of the Oil Management Fund, which will be used to cover the contaminant clean up and the compensation for the damages to health and livelihoods due to the oil spill incidents.

A 200,000 liters of oil spill can lead to a devastating environmental impact, which will linger for years, even decades, where its pristine waters were once home to coral reefs, a vast variety of fish and marine life, seaweed farms, sea grass beds and beaches.

[3] The affected people who have been compensated are said to have received around 4,800 pesos to 32,000pesos.

3) Natural Resource Development

Oil and Gas Development in East Java: East Java contains the third biggest oil deposit in Indonesia after East Kalimantan and Riau. Table 5.4.3 shows the volume of oil and gas deposit in East Java. Oil and gas development therefore is the major natural resource development sector and the most sensitive natural resource development activities with relation to the port development or channel development planning in East Java in general and in GKS in particular. In this regard, this section discusses about the oil and gas development in East Java and in GKS.

Table 5.4.3 Oil and Gas Deposit in East Java

Reserves	Unit	Proven	Probable	Total
Oil and condensate	MSTB	161,384	422,091	583,475
Natural Gas	BSCF	5,542	4,759	10,301

Source: BAPPEDA, East Java
Note: MSTB: Thousand Stock Tank Barrels (6.3 barrel equals 1 metric ton)
BSCF: Billion Standard Cubic Feet (1 cubic meter of natural gas equals 1/2 ton of gas)

Present Situation of Oil and Gas Production: The oil and gas concession area of East Java is divided into 28 blocks. The proven deposit of major exploration blocks in East Java is as described in Table 5.4.3

Crude Oil Production of East Java: The total volume of crude oil and condensate production in East Java in 2004 was around 230,000 barrels per day. As the total crude oil production in Indonesia in the same year was around 900,000 barrels per day, the crude oil production of East Java accounts almost 24% of the total crude production volume of Indonesia. The oil and condensate production volume by operating companies in East Java is as shown in Table 5.4.5.

Natural Gas Production in East Java: Indonesia has some of the largest known pools of natural gas in the world, with a total estimated reserve of 187 trillion standard cubic feet (TCF) with breakdown as follows: proven (91 TCF), probable (43 TCF) and possible (44 TCF). Indonesia produced 8.16 TCF of gas in 2006 and ranked eighth in the. 45% of production is used domestically, particularly for power generation, fertilizer production and other industrial use.

In Indonesia, natural gas production has been rising constantly at a modest four percent in these years. Liquefied natural gas (LNG) exports remained stable and it accounts for around 55% of the country's total gas production and generating foreign exchange amounting US$ 6 billion per year. LNG is exported to Japan (71%), South Korea (20%) and Taiwan (9%). Indonesia also exports natural gas via pipeline to Singapore and Malaysia, reaching 118 BCF. As such the revenue from LNG and natural gas exportation is substantial.

The proven reserve of natural gas in East Java is estimated at around 29.0 TCF in total, thus, it accounts almost 15% of the total gas reserve of Indonesia. The gas production of Indonesia is dominated by seven major companies, namely TotalFinaElf (28%), ExxonMobil (19%), VICO (12%), Pertamina (11%), Conoco-Philips (9%), EMP (8%), and Unocal (5%), which account for 92% of all production.

The present gas production of East Java is around 300 MSCFD and with Indonesia production being around 2,600 MSCFD, thus, it East Java accounted for 11% of the total gas production volume in Indonesia. The production of gas by operating companies in East Java is as shown in Table 5.4.6 as of 2006.

Table 5.4.4 Deposit of Oil and Gas Concession Block

No.	Developer/ Operator	Name of Block	Deposit		Reserve (Potential)		Type	Area (km2)
			Oil	Gas	Oil	Gas		
			MBBLS	MMCF	MBBLS	TCF		
1	Amerada Hess	Pangkah			14,300	0.44	PSC	3,924
2	EMP Bawean	Bawean I	10,120				PSC	
3	EMP Kangean	Kangean				2.75	PSC	18,035
4	EMP Muriah Ltd	Muriah					PSC	14,457
5	Conoco-Philips Ltd	Ketapang			No finding	No finding	PSC	4,433
6	INDO Pacific Resources	Bawean				3.25	PSC	15,130
7	Pertamina-MEDCO Madura	On-shore Madura			No finding	No finding	JOB	2,728
8	Pertamina-PETROCHINA	Tuban	20,000	9,240			JOB	2,728
9	KODECO Energy	West Madura	1,487,000	9,698	22,618	1.51	JOA	6,460
10	KODECO Poleng	Poleng	1,487	9,698		2.44	TAC	40
11	LAPINDO Brantas	Brantas				0.12	PSC	14,950
12	LUNDIN Blora	Blora			No finding	No finding		
13	Mobil CEPU	Central East Java		248	250	0	TAC	1,670
14	Mobil Madura Strait	Madura Strait	2,060,000	483	No finding	No finding	PSC	13,970
15	RIMS Energy Karapan	Karapan			No finding	No finding	PSC	3,803
16	Santos	Madura Offshore			No finding	No finding	PSC	4,426
17	Santos	Sampang			No finding	No finding	PSC	2,677

Note: PSC: Production Sharing Contract, TAC: Technical Assistance Contract, JOA: Joint Operation Assistance
JOB: Joint Operation Body, MMCF: Million Million Cubic Feet, TCF: Trillion Cubit Feet

Table 5.4.5 Crude Oil Production in East Java

No.	Operator	Crude Oil Production (BBLS/day)		
		Oil	Condensate	Total
1	Doh Jabati	4,304	0	4.304
2	Petro-China EJ	38,118	0	38,118
3	Tac – Kodeco Poleng	47,328	0	47,328
4	EMP Kengean	0	12,798	12,798
5	Kodeco Energi	122,127	1,728	123,855
6	Indo Pacific Resource	2,438	0	2,438
	Total	214,315	14,526	228,841

Source: BAPPEDA, East Java
Note: 1) BBLS: barrels (1 barrel equal 159 liter)
2) Condensate is a substance of hydrocarbon and exists normally underground in a form of gas but when it is appeared on the ground surface it is condensed in a form of liquid. Its character is similar to the crude oil produced to which this liquid is associated with.

Table 5.4.6 Natural Gas Production of East Java in 2004

No.	Operator	Gas Production (Unit: MSCFD)	Share (%)
1	EMP Kengean	118,586	40.6
2	KODECO Poleng	75,868	26.0
3	LAPINDO Brantas	64,527	22.0
4	KODECO Energi	22,828	7.8
5	PetroChina East Java	7,832	2.7
6	Indo Pacific Resource	1,293	0.0
7	Doh Jabati	914	0.0
8	Total	291,848	100.0

Source: BAPPEDA, East Java

Note: 1) MSCFD means Million Standard Cubic Feet per Day
2) EMP Kengean was formally formed by Atlantic Richfield but BP acquired this firm the present major owner is BP.

Profile of Oil and Gas Development in East Java: As discussed in the preceding section, the oil and gas production of East Java accounts for 24% of total crude oil production and 11% of total gas production of Indonesia. The use of natural gas produced in East Java is dominated by electric power generation (PT. PLN) and fertilizer production (PT. Petrokemia). Production of LNG for export in East Java is not feasible because of the size of gas reserve and the production wells are scattered over a wide area. This implies that the gas pipe network is imperative and plays an important role to support the industry of East Java.

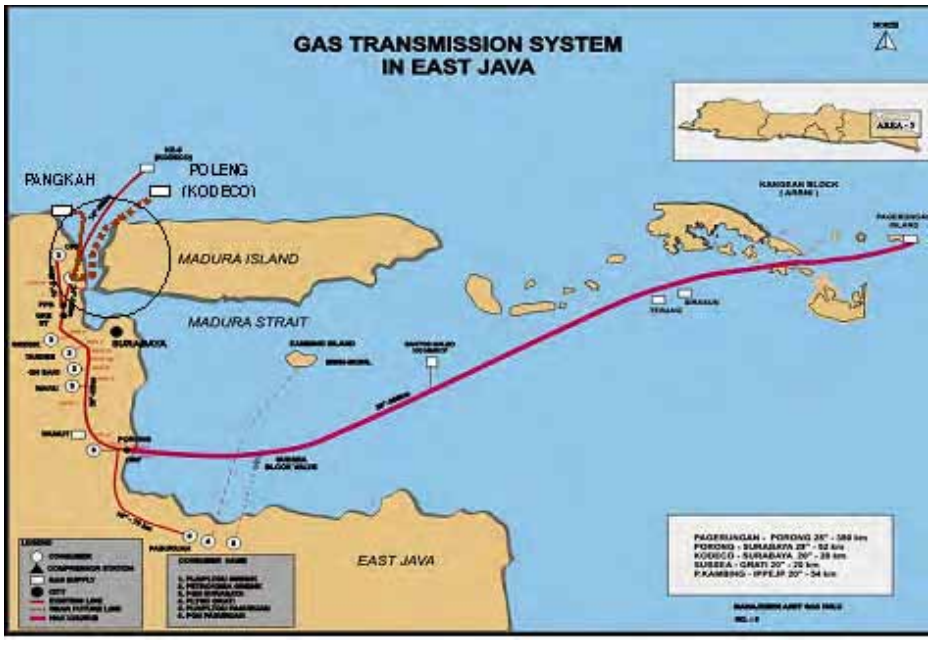
The peculiar condition of domestic gas use in East Java as that the major user of natural gas is concentrated in one place, i.e. Gresik, therefore, the gas pipelines is to be installed along the narrow channel and/or through populous area. For instance, a combined 16 blocks for oil and gas exploration among the 28 blocks in East Java, is populated by around 13 million people which is quite unusual in the world. The population density per one square kilometer in oil and gas exploration or production block on land in Indonesia, especially in East Java is quite high, considering that many of the crude oil and gas production area on land in the world exist in deserts, jungle, barren land, or the like.

Gas Transmission System in East Java: A number of gas pipelines supplying natural gas to major gas users, mainly PT. PLN and PT. Petrolkemia Gresik in Gresik, have been operating in East Java since 1990. The profiles of the gas pipeline by pipeline operator are as outlined as follows.

At present in East Java, the production of natural gas is dominated by KODECO (Korean Development Corporation, China National Off-shore Oil Corporation (CNOOC) and Pertamina and EMP Kangean. The share of gas production by KODECO is around 35% and EMP Kangean is around 45% of the total gas production volume per year.

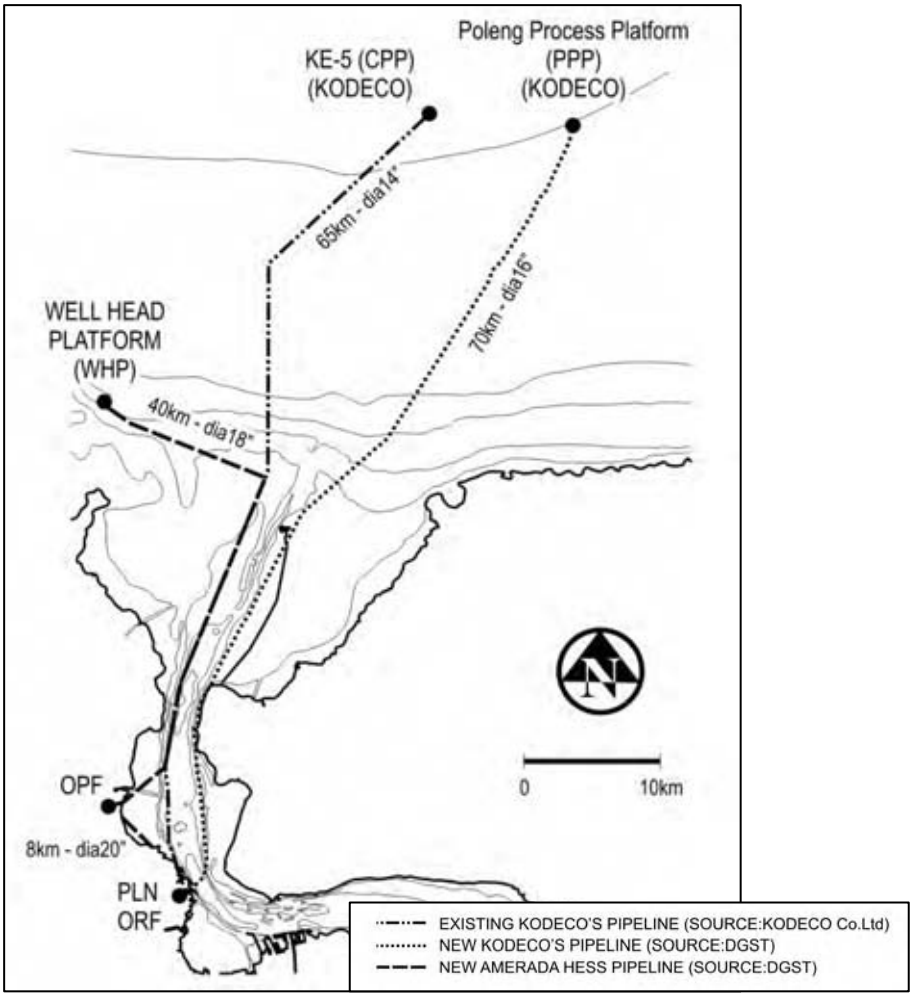
Figure 5.4.2 illustrates the present and future network of gas transmission pipelines in East Java. Figure 5.4.3 details the pipelines in the Madura Channel, as indicated by a black circle in FRigure 5.4.2 as a general location reference.

Figure 5.4.2 Gas Transmission Pipeline System in East Java



Note: JICA Study Team added new pipeline (Red dotted line) on Pertamina's base figure.

Figure 5.4.3 Existing and Planned Gas Transmission Pipeline in the Madura Channel



Source: JICA Study Team

The feature of each gas transmission pipelines in East Java is summarized in Table 5.4.7.

Table 5.4.7 Feature of Gas Transmission Pipelines in East Java

Route	Pipe Dia.	Length (km)	Capacity (MMSCFD)	Operation Status
KE-5 (KODECO) – Gresik	14"	65	120	Since 1990
Pagerungan (EMP) – Porong	28"	380	300	Since 1994
Porong (EJGP) – Surabaya	28"	52	300	Since 1994
Pangkah (Amerada Hess) – Gresik	18"	48	100	Since 2006
Poleng (KODECO) – Gresik	16"	70	120	Preparation

Note:
1) Maximum operating pressure is 1,800 psig for off-shore portion and 900 psig for on-shore portion.
2) KODECO's new pipeline has got a construction permit from Departmen Dan Sumber Daya Mineral Republik Indonesia, Direktorat Jendral Minyak Dan Gas Bumi (MIGAS) in November 2006.
3) The construction of KODECO's new pipeline which run along the western coast of Madura Island and cross the Madura Channel along the same alignment of submersible power cable at the depth of 20 meter from the sea bed with its length of about 2 km.

The details of gas transmission pipeline operation by owner or by operator are as follow.

KODECO started to supply natural gas to PT. PLN and PT. Petrokemia Gresik since 1990 through their own gas pipeline of 14" – 65 km which connects their off-shore gas production

platform KE-5 and their own on-shore receiving facilities (ORF) at Gresik located beside PT. PLN. Thus, KODECO is the first gas producer, supplier and transporter in East Java.

KODECO planned and obtained a permit to construct other gas pipeline of 16" – 70 km which runs from Poleng Processing Platform to the existing ORF in August 2006. This pipeline is designed to be laid down along the shore of western Madura Island as illustrated in Figure 5.4.3 as "new pipeline".

As indicated in the figure, the alignment of the new gas pipeline is quite close to the designated area for the construction of new ports along the western coast of Madura Island, as it crosses the Madura Channel at the depth of 20 m from the sea bed along the existing submerged power cable connecting Java and Madura Island. Taking such critical situations into account, DGST has decided not to allow extension of the technical permit specifying pipeline alignment. For reference, the technical permit has one year's validity before construction and it was issued in August 2006.

AMERADA HESS has started to supply natural gas to PT. PLN and PT. Petrokemia Gresik since November 2006 through their own gas pipeline of 18" - 40 km which connects their off-shore gas production platform at Pangkah to their ORF located at Maspion Industrial Estate in Gresik and through 18" – 8 km on-shore pipeline to their client in Gresik. The pipeline is designed to transmit 100 MMSCFD of natural gas.

East Java Gas Pipeline (EJGP) was designed in 1990 and developed by PT. Transjava Gas Pipeline (TJP). EJGP is built as open access and a common carrier for gas that is produced in Kangean block (western part of off Madura Island) and other companies such as Santos supplying gas in East Java. The first gas sale was commissioned in January 1994. Presently, EJGP is used by two gas producers namely EMP Kangean Ltd., and PT. Santos Maleo that holds a concession in the Madura Strait. The gas is transferred through a 28" - 370 km pipeline from Pagerungan Besar Island in Kangean to Porong where Onshore Receiving Facilities (ORF) is located, then transmitted to the customer through on-shore pipeline. The design capacity of this pipeline is 600 MMSCFD with an operating pressure of 1,800 psig off-shore part and 900 psig on-shore.

In November 2006, the gas pipeline of EJGP at near Porong ORF located in the area of the Sidoarjo Mudflow Disaster broke and exploded due to deformation of gas pipeline caused by mudflow. As this gas pipeline is a primary lifeline of Surabaya, urgent repair was undertaken place by afixing a 2.5 km jumper line. The permanent gas pipeline to by-pass the mudflow area is planned to be constructed with an amount of US$ 17 million. Construction will commence soon but it will take around 2 years to complete.