ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN)

THE MASTER PLAN AND FEASIBILITY STUDY ON THE ESTABLISHMENT OF AN ASEAN ROLL-ON/ROLL-OFF (RO-RO) SHIPPING NETWORK AND SHORT SEA SHIPPING

FINAL REPORT

SUMMARY

March 2013

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ALMEC CORPORATION
Japan Marine Science Inc.
The Overseas Coastal Area Development Institute of Japan (OCDI)

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Exchange rates used in the report

US$	1.00	=	JPY	81.48			
EURO	1.00	=	JPY	106.9	=	US$	1.3120
BN$	1.00	=	JPY	64.05	=	US$	0.7861
IDR	1.00	=	JPY	0.008889	=	US$	0.0001091
MR	1.00	=	JPY	26.55	=	US$	0.3258
PhP	1.00	=	JPY	1.910	=	US$	0.02344
THB	1.00	=	JPY	2.630	=	US$	0.03228

(as of 20 April, 2012)

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ABBREVIATIONS

AEC	ASEAN Economic Community
AFAFGIT	ASEAN Framework Agreement on the Facilitation of Goods in Transit
AFAFIST	ASEAN Framework Agreement on the Facilitation of Inter-State Transport
ASEAN	Association of Southeast Asian Nations
BIMP-EAGA	Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area
CHARO	Chassis RO-RO
CIQS	Custom, Immigration, Quarantine and Security
DGLT	Directorate General of Land Transportation, Indonesia
DGST	Directorate General of Sea Transportation, Indonesia
DWT	Dead Weight Tonnage
ERP	Electronic Road Pricing
EU	European Union
FIRR	Financial Internal Rate of Return
GDP	Gross Domestic Product
Gensan	General Santos City, Philippines
GMS	Greater Mekong Subregion
GMS-CBTA	Greater Mekong Sub-regional Cross Border Transport Agreement
GRDP	Gross Regional Domestic Product
GT/GRT	Gross Tonnage/Gross Registered Tonnage
ICP	International Circulation Permit
IMO	International Maritime Organization
IMT-GT	Indonesia-Malaysia-Thailand Growth Triangle
ISPS Code	International Ship and Port Facility Security Code
JICA	Japan International Cooperation Agency
KADIN	*Kamar Dagang dan Industri Indonesia*, Chamber of Commerce and Industry, Indonesia
LCC	Low Cost Carrier
LNG	Liquefied Natural Gas
LOA	Length Over All
LO-LO	Lift-On, Lift-Off
MARPOL	International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978
MOU	Memorandum of Understanding
MTWG	Maritime Transport Working Group
NCV	Non-Conventional Vessel
NILIMJ	National Institute for Land and Infrastructure Management of Japan
nm	Nautical Mile

O-D	Overseas Coastal Area Development Institute of Japan
PELINDO	*PT Pelabuhan Indonesia*, Indonesia Port Corporations
PELNI	*PT Pelayaran Nasional Indonesia*
PPP	Public–Private Partnership
RHD/LHD	Right Hand Drive/Left Hand Drive
ROPAX	RO-RO Passenger
RO-RO	Roll-On, Roll-Off
SOLAS	November 1995 amendments to Chapter II-1 of the International Convention for the Safety of Life at Sea
SSS	Short Sea Shipping
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
TBFT	Tanjung Belungkor Ferry Terminal
TEN-T	Trans-European Transport Network
TEU	Twenty-foot Equivalent Unit
TOR	Terms of Reference
TTR	Transit Transport Route
UK	United Kingdom of Great Britain and Northern Ireland

1 INTRODUCTION

1.1 Scope of the Study

1) Study Objectives

The study objectives are threefold:

(1) To collect and analyze a series of regional sea and land transport data/information in ASEAN, Europe and other regions to realize expansion/opening of RO-RO routes with efficient and reliable services;

(2) To select priority routes among the routes to be studied and identify development issues and necessary policy recommendations by route; and

(3) To recommend necessary policy initiatives to ensure RO-RO shipping services among ASEAN Member States after surveying legal and institutional frameworks in relation with international sea and land transports.

2) Definition of RO-RO Ships

The International Maritime Organization (IMO) defines roll on – roll off ship as '*a passenger ship with ro-ro cargo spaces or special category spaces*'.

According to the November 1995 Amendments to the STCW1974, '*ro-ro cargo spaces*' is a space in which goods, in or on rail or road cars, vehicles, trailers, containers, etc. are loaded and unloaded. '*Special category space*' is an enclosed space that is intended for the carriage of motor vehicles.

The Study defines three (3) RO-RO shipping types under its coverage.

Shipping Type	Image of Ship Type	Competitors in the Market
Short-distance ROPAX Service		- Fast Craft - Passenger Ship - Cargo Passenger Ship - General Cargo Ship - Container Ship (small)
Middle to Long-distance ROPAX Service		- Container Ship - Passenger Ship - General Cargo Ship - Car Carrier - Road Truck/Trailer - Expressway Bus - Aircraft (passenger, cargo)
Middle to Long-distance RO-RO Service		- Container Ship - Road Truck/Trailer - Aircraft (cargo)

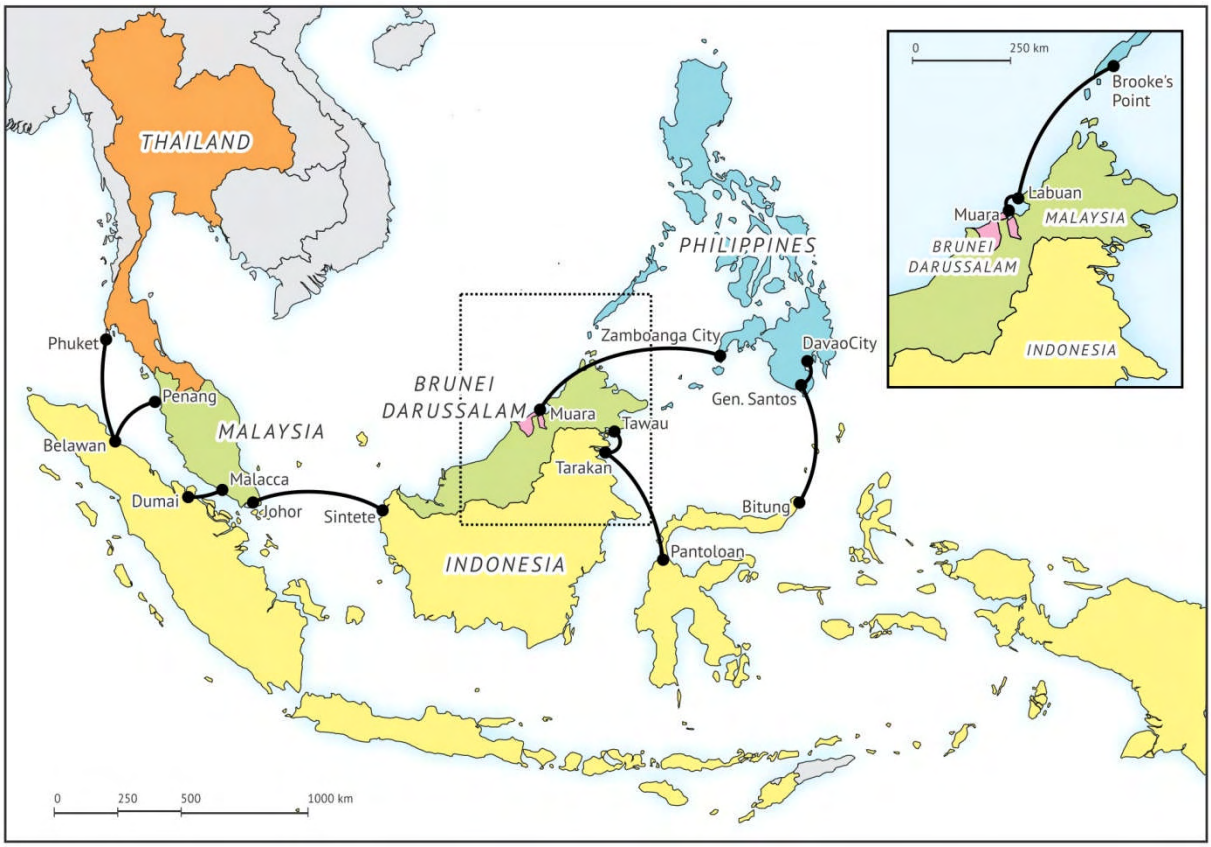
Source: JICA Study Team

Figure 1.1 RO-RO Shipping Types under the Study

3) Study Area

Legal and institutional analysis has been undertaken at all 10 ASEAN member states.

The Study examined eight (8) RO-RO shipping candidate routes connecting five (5) countries: Brunei Darussalam, Indonesia, Malaysia, Philippines and Thailand. The list was modified and amended during the deliberation on the Inception Report starting from the six (6) routes described in the original TOR prepared by ASEAN.



Source: JICA Study Team

Figure 1.2 RO-RO Shipping Candidate Routes for the Study

1.2 Progress of the Study

The Study was mobilized in January 2012. The Inception Report was approved at the 23rd ASEAN Maritime Transport Working Group held in Yangon in March 2012.

The first field survey was conducted during the period March to May 2012. The JICA Team visited five (5) national capitals and 17 port cities. A variety of stakeholders, 212 persons in total, participated in the consultation meetings and/or interviews with the JICA Team (refer to Table 1.1).

For legal and institutional country survey, a team of ASEAN experts visited ten (10) national capitals. The JICA Team joined the meetings at four (4) of those national capitals.

The JICA Team delivered the Interim Report to the Member States and discussed it during the First Regional Workshop at Manila, Philippines on 24-24 July 2012. In the workshop, three (3) priority routes for early implementation by 2015 were selected.

From August to October 2012, the second field survey was conducted on the priority routes. The JICA Team individually interviewed 209 stakeholders who are likely users of new RO-RO shipping service (refer to Table 1.2).

The JICA Team presented study progress and identified RO-RO shipping development issues at various meetings such as the BIMP-EAGA meeting (in June), the IMT-GT meeting (in September) and the ASEAN Coordination Committee on Customs (in November).

It is also noted that the Japan – ASEAN Connectivity Coordination Committee Meeting at Phnom Penh, Cambodia on 9 September 2012 included this study project in the agenda for coordinating particularly legal and institutional issues.

The study progress was presented at the 24th ASEAN MTWG held in Yangon in October 2012. The meeting noted:

(i) Common factors and best practices of international RO-RO shipping;
(ii) Institutional issues to affect RO-RO shipping operation;
(iii) Anticipated roles of ASEAN transport facilitation agreements and route-wide MOUs to support ASEAN RO-RO shipping, and
(iv) Determination of the priority routes for further detailed study.

The Second Regional Workshop was held in Jakarta on 6 December 2012 where development plans and implementation arrangement of the priority routes were presented and discussed.

After the workshop, this Draft Final Report has been compiled for deliberation among the Member States.

Table 1.1 Number of Stakeholders Involved in the First Field Survey

Port		Port operator, port authority	Shipping company, ship owner, ship agent	Forwarder, forwarder assoc.	Cargo owner	Travel agent, tourism sector	Immigration, customs	Trader association, chamber of commerce, investment board	Other govt. agencies	Other private sectors	TOTAL
Indonesia	Bitung	3	3	1				2		3	**12**
	Pantoloan	3	3	1		1	1	2	2		**13**
	Tarakan	3	1				2	2	2		**10**
	Sintete	2					2	1	1	1	**7**
	Belawan	2	4	1	1		2	1	1		**12**
	Dumai	2	4	2			2	1	2		**13**
Malaysia	Penang	1	3			1	1		2		**8**
	Malacca, KL	1					1		3		**5**
	Johor	1				1		1			**3**
	Labuan	1									**1**
	Tawau, Sabah	3	1					1	2		**7**
Brunei	Muara	1	1			3	1	1	1		**8**
Philippines	Davao				3	3		3	7		**16**
	Gensan	2	2		5	2	2	4	12	2	**31**
	Brooke's	1			4	1	2	7	11	2	**28**
	Zamboanga	2	4	1	6		1	4	6	3	**27**
Thailand	Phuket, BKK	1	1			1	1	1	6		**11**
TOTAL		**29**	**27**	**6**	**19**	**13**	**18**	**31**	**58**	**11**	**212**

Source: JICA Study Team

Table 1.2 Number of Stakeholders Interviewed in the Second Field Survey

Region	Shipper/ Manufacturer/ Processor	Trader/ Distributor/ Retailer	Forwarder	Travel and Tour Operator	Total
Pekanbaru	0	1	5	5	11
Dumai	2	1	1	0	4
Malacca	0	3	0	5	8
Medan/Belawan	6	4	15	10	35
Penang	3	3	18	16	40
Phuket	2	1	3	4	10
Gensan	21	6	2	5	34
Davao	13	2	3	4	22
Bitung/Manado	10	3	17	15	45
Grand Total	57	24	64	64	209

Source: JICA Study Team

1.3 Study Organization

In the course of the Study, the Philippines and Indonesia have worked as the coordinating countries, while the other countries designated contact points to the JICA Team. The first and second field surveys and the legal and institutional country survey were conducted in collaboration with all the countries without delay.

Table 1.3 Study Organization

	Name	Organization/State
JICA Study Team	Mr. KUMAZAWA Ken	Team Leader / Sea & Land Transport Plan
	Mr. INOUE Kazuma	Comprehensive Shipping Policy
	Mr. ARIKAWA Hideo	Market Analysis / Demand Forecast
	Capt. SHIGETA Sigeo	Route Plan 1 – Fleet / Financial Analysis 1 (Jan-July, 2012)
	Mr. TAKASAKI Toshiyuki	Route Plan 1 – Fleet / Financial Analysis 1 (from Aug, 2012)
	Mr. SHISHIDO Tatsuyuki	Route Plan 2 – Port
	Mr. AOYAMA Noriyuki	Ship Design
	Mr. Samuel C. CUSTODIO	Legal and Institutional Analysis
	Mr. NOSE Michiharu	Financial Analysis 2
	Mr. Ronald G. SISON	Implementability Assessment through Participatory Approach
	Dr. KANAI Yoshikazu	Assistant to Team Leader / Sea & Land Transport Plan
JICA HQ	Mr. SUZUKI Jun	Officer-in-Charge
	Mr. KOMORI Takashi	Officer-in-Charge
Indonesia	Mr. Adolf R. Tambunan	Indonesia Study Coordinator
	Mr. Simson Sinaga	Indonesia Study Coordinator
	Mr. Johnny Siagian	Indonesia Study Coordinator
Philippines	Mr. Arsenio F. Lingad II	Philippine Study Coordinator
Brunei Darussalam	Hj Shahrani Hj Manan	Contact Point
Cambodia	Mr. Nhem Savong	Contact Point
Lao PDR	Mr. Somphone LOUANGLATH	Contact Point
Malaysia	Mrs. Elina Roslim	Contact Point
	Mrs. Nor Fazila Ramli	Contact Point
Myanmar	Mr. Ko Ko Naing	Contact Point
Singapore	Ms. LEE Wen Jie	Contact Point
Thailand	Ms. Kamolwan Kularbwong	Contact Point
Vietnam	Ms. Nguyen Viet Thi	Contact Point
ASEAN Secretariat	Ms. Megasari Widyaty	Officer-in-charge

2 INTERNATIONAL RO-RO SHIPPING PRACTICES

2.1 East Asia (Japan, Korea, China)

The Study collected and analyzed twenty-six (26) RO-RO shipping routes as of April 2012 (6 routes between Japan and Shanghai and Bohai of China, 5 routes between Japan and Korea, and 15 routes between Korea and Bohai and the Yellows Sea of China).

Figure 2.1 illustrates these routes (red lines) and some recently suspended routes (yellow line) for reference.

Many of them have a sailing distance of less than 600 nm (1,111 km) with a sailing time between 12 and 40 hours.

In regard to ship size, many ROPAX vessels have LOA of 140 to 200 m and cargo loading capacity of 120 to 300 TEU equivalent.

Figure 2.1 International RO-RO Shipping Routes in East Asia (as of April 2012)

Table 2.1 Operation Conditions of RO-RO Shipping Routes in East Asia

Connecting Countries	Route	Operator	Sailings /Week	Transit Time (Hrs)	Container Traffic (TEU)	Estimated Capacity by RO-RO
Japan - China	6	6	18	18 – 50	3.0 mil	0.10 mil
Japan - Korea	5	4	26	12 – 21	1.5 mil	0.18 mil
China - Korea	15	13	32	14 – 24	3.5 mil	0.44 mil

Source: Collected route information by JICA Study Team

The Study estimates an average cargo load factor of around 50% based on the collected information as well as some interviews with Japanese RO-RO operators.

According to the National Maritime Research Institute of Japan, the shares of seaborne container traffic in East Asian between container shipping and RO-RO shipping are 88% and 12%, respectively.

Table 2.2 Estimated RO-RO Shipping Share in Container Transportation

Ship Type	No. of Calling Vessels	Estimated Cargo Traffic by Volume (x 1000TEU)	Percentile (%)
Container Ship	191	120	88 %
RO-RO Ship	23	11	8 %
ROPAX	16	5	4 %

Source: National Maritime Research Institute of Japan, 2010

2.2 Europe

Figure 2.2 RO-RO Shipping Network in the Baltic Sea

Europe has pursued an effective logistics across individual states' borders since 1980. In the 1990s, EU's policy initiatives greatly reduced freight movement constraints and thus RO-RO shipping became advantageous to provide seamless services.

The following policy packages are impressive and still important on free cargo flow within EU:

- Year 1993: Commencement of phased lifting of shipping cabotage right within EU, simplification of customs procedure; and
- Year 1998: Streamlining logistics related procedures. Removal of cabotage right on trucking service within EU.

Since the 2000s, more concerns of balanced modal composition and environmental protection have been addressed in the Trans-European Transport Network (TEN-T). One initiative is the Marco Polo Programme which shifts freight from the road to sea, rail and inland waterways at some designated routes and areas. Now the Marco Polo II Programme (2007-2014) where several inter-state RO-RO shipping routes or 'Motorways of the Sea' are planned is put into practice with an annual budget of around 60 million Euro.

Figure 2.2, which came from a Polish shipping and shipbuilding journal, illustrates the year 2011 RO-RO shipping network of 98 routes by 29 operators.

The next example comes from UK's short sea shipping (SSS) which is divided into Near Continent of Europe, the Channel, the Irish Sea, Scandinavia and the Baltic. The SSS has the following features:

- RO-RO shipping accounts for 76% of SSS. The share is sensitive to sailing distance where RO-RO takes more share on a shorter route. RO-RO shipping enjoys the lion's share on the routes of less than 200 nm (370 km).
- ROPAX vessels, carrying both passengers and cargo are observed on the routes at the Channel. On the other hand, freight RO-RO vessels are dominant on the routes at the Baltic Sea where the route distance is around 500 nm (926 km) on the average.
- There are 41 ports serving for SSS in the UK with 151 dedicated berths for RO-RO vessels. The port system involves a considerable number of local minor ports.

Table 2.3 UK SSS Routes with RO-RO Shipping Shares, 2010

Connecting Regions	Route	Operators	Sailing	% of RO-RO	Total Capacity
Near Continental	21	6	198	77 %	4,539,069 unit
Channel	11	6	434	95 %	5,571,669 unit
Irish Sea	14	5	254	97 %	2,848,544 unit
Scandinavian	6	2	22	80 %	671,237 unit
Baltic	6	5	7.5	35 %	233,034 unit

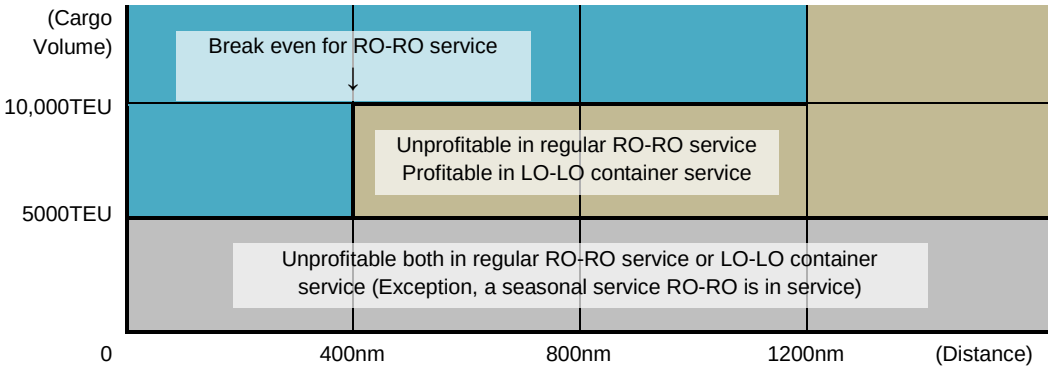
Note: Unit = Forty-foot Container Equivalent Unit

Source: Relevant Route Information compiled by JICA Study Team

2.3 Factors Affecting Route Operation Viability

There are some guidelines to find viable routes by RO-RO shipping service. The section introduces one guideline based on the analysis of the Northeast Asian RO-RO services as shown in Figure 2.3.

The route operation viability is indicated at more than 5,000 TEU, in the case of a short distance of less than 400 nm (741 km). A sizeable cargo demand of 10,000 TEU or more can make longer routes viable. However RO-RO shipping may compete with LO-LO shipping (container shipping) up to 1,200 nm (2,222 km) in the same routes.



Source: Aomori Port Internationalization Conference, 2004

Figure 2.3 Route Operation Viability in terms of Cargo Volume and Route Distance

3 DOMESTIC RO-RO SHIPPING PRACTICES

3.1 Japan

Japanese domestic shipping have RO-RO shipping services by freight RO-RO vessels and ROPAX vessels. The current situations in 2012 are summarized below.

The existing freight RO-RO fleet is composed of 37 vessels with11 operators on 18 routes. The busiest route connects Kanto Region, including Tokyo, with Hokkaido. The average vessel size is 9,600 GRT with 100 chassis and 280 cars in capacity.

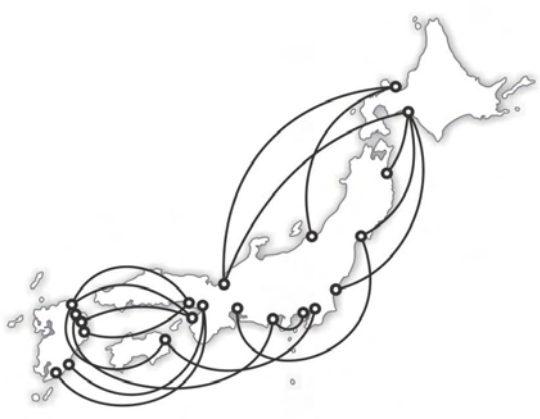


Figure 3.1 Middle to Long-Distance ROPAX Shipping Routes in Japan

ROPAX vessel routes are administratively divided into short, middle and long-distance routes. Short-distance routes mainly serve for 354 small inhabited islands except for the main four (4) islands. The vessel types are small RO-RO vessels, fast passenger boats, ordinary passenger ships. The fleet is numerous, i.e. 579 vessels but small in size, i.e. 353 GRT. In recent years, the volume of the short-distance shipping service has been stagnant or reduced in line with population shrinkage at remote islands.

The routes of middle-distance ROPAX service between 100 km and 300 km sharply decreased due to bridging and tunneling projects among the main four (4) islands. Today, 20 vessels (6,204 GRT on the average) are assigned on five (5) routes.

A ROPAX fleet for long-distance service includes 35 vessels on 14 routes, 739 km on the average. The vessel size is rather large, ranging from 9,476 GRT to 20,564 GRT. Since the fleet must compete with trucks on expressways, all vessels have over 20 knots as sailing speed and some exceed 30 knots.

3.2 Philippines

According to the ship registry, 40 ROPAX vessels serve for domestic shipping. Their average size is 2,030 GRT. The county started ROPAX service at some short-distance inter-island routes in the 1970s. Thereafter, the network has been expanding. In the 1990s, considerable Japanese middle-distance ROPAX vessels were traded to the Philippines and assigned to middle to long-distance routes.

In 2003, the Philippine government introduced a nautical highway concept combining land transportation and small RO-RO vessels and consisting of three routes, the Eastern, Central and Western nautical highways.

Currently, middle to long-distance ROPAX services are done by 7 vessels ranging from 6,090 GRT to 11,914 GRT. They connect Manila with the major ports of Visayas and Mindanao. Container on chassis is a major form of cargo transportation with the vessels and it competes with domestic container shipping. Middle to long-distance ROPAX services used to attract substantial passengers because of low tariff setting. In recent years, shipping has greatly lost its market share due to the emergence of LCCs in the air transport.

Philippine ROPAX services have largely depended on Japanese built second-hand vessels. Nowadays, the second-hand ship market is tight due to low supply of ROPAX vessels and thus the ROPAX fleet is aging and becomes more vulnerable against maritime accidents.

There is neither state-owned shipping company nor operation subsidy to private shipping company in the Philippines. The governmental role does not extend to direct shipping service provision.

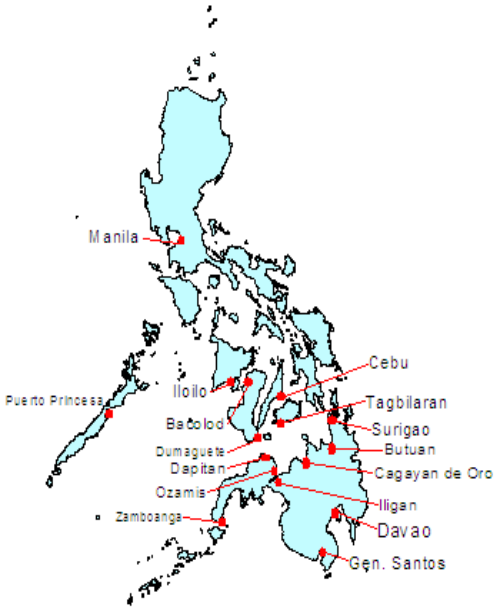
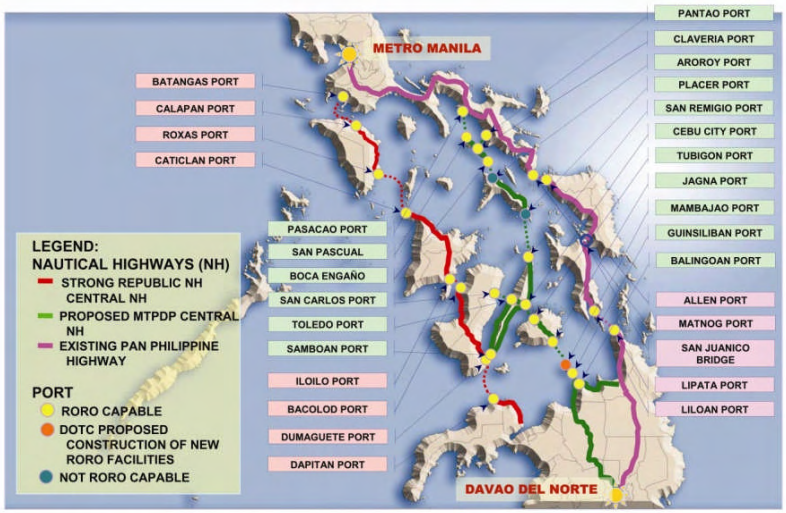


Figure 3.2 Ports-of-Call by Middle to Long-Distance ROPAX Vessels



Source: Mid-Term Development Plan (2004-2010)

Figure 3.3 Nautical Highways

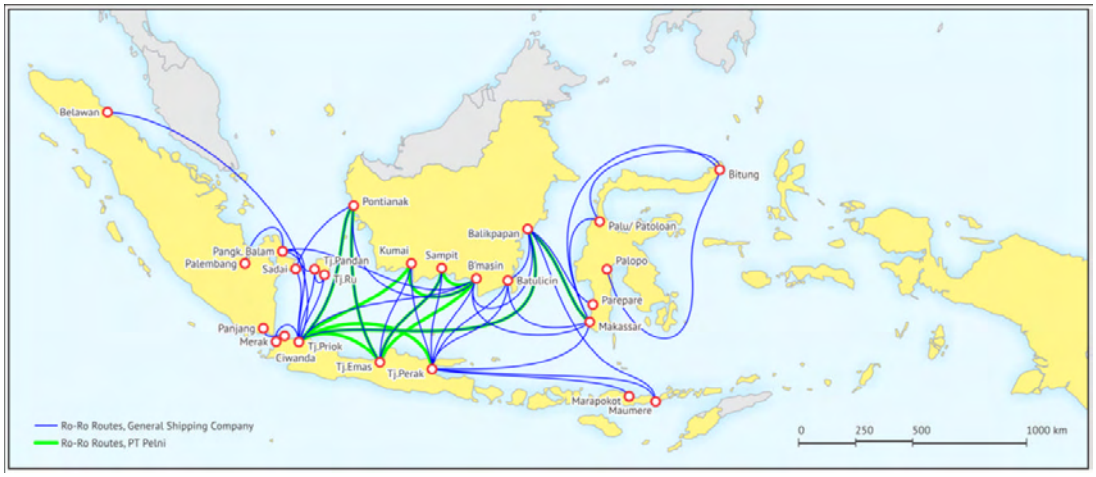
3.3 Indonesia

Indonesia started its domestic RO-RO services in the 1970s. The country has many similar features in the RO-RO shipping development like the Philippines. They include: no freight RO-RO vessel introduced; mostly dependent on Japanese second-hand vessels in acquisition; the issues of aging fleet and being prone to accidents; and recently losing their passenger market share because of air LCCs.

Indonesia has different RO-RO shipping administration with the Philippines. In terms of shipping business, DGST administers middle to long-distance ROPAX operators while DGLT administers short-distance shuttle route operators. There are state-owned and private RO-RO operators and commercial and subsidized routes under both DGST and DGLT authorities.

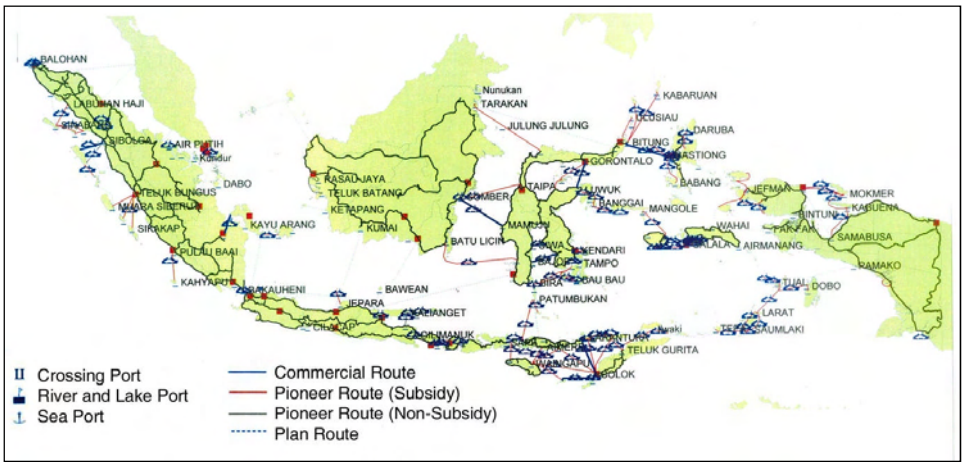
There are 27 vessels engaged in middle to long-distance ROPAX services with an average vessel size of 4,917 GRT. As depicted in Figure 3.4, the routes connect Java with Sumatra, Kalimantan and Sulawesi. There is no route to the Maluku Islands and further eastwards.

In regard to short and shuttle service routes, a state-owned operator, PT. ASDP Indonesia Ferry, owns 98 vessels. Private operators which are composed of small to large operators, 27 operators in total, own 103 vessels. The routes consisting of commercial and subsidized ones cover all over the archipelago from east to west including remote islands.



Source: DGST, Indonesia

Figure 3.4 Middle to Long-Distance ROPAX Routes



Source: DGLT, Indonesia

Figure 3.5 Short and Shuttle Ferry Routes

4 LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 International Conventions

The international conventions governing RO-RO shipping have been reviewed, including SOLAS, ISPS-Code, MARPOL and STCW. In response to a series of RO-RO ferry accidents in the late 1980s, the International Convention for the Safety of Life at Sea (SOLAS) repeatedly amended the provisions relating to RO-RO ship design, construction and navigation.

4.2 ASEAN Cooperation

The following ASEAN agreements in relation to international RO-RO shipping have been reviewed and analyzed in terms of actual implementation:

- The Agreement on the Recognition of Domestic Driving Licenses Issued by ASEAN Countries (1985)
- The Agreement on the Commercial Vehicle Inspection Certificates for Goods Vehicles and Public Service Vehicles Issued by ASEAN Member Countries (1998)
- ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT, 1998)
- Ministerial Understanding on the Development of the ASEAN Highway Network Project (1999)
- ASEAN Framework Agreement on the Facilitation of Inter-State Transport (2009)
- ASEAN Framework Agreement on Multimodal Transport (2005)
- ASEAN Sectoral Integration Protocol for the Logistics Services Sector (2007)
- MOU on Cooperation Relating to Marine Casualty and Marine Incident Safety Investigations (2009)
- Agreement to Establish and Implement the ASEAN Single Window (2005)

These official ASEAN documents are all important to support international RO-RO shipping. Although they were agreed upon and signed among the member states, however, the situations do not mean their full implementation as they are stated. For instance, the driving license agreement is the oldest and it already takes effect in implementation. But some member states have not yet submitted their domestic license category to the ASEAN Secretariat; hence, it cannot be regarded as under full implementation. The vehicle inspection certificate agreement was put into effect in 2007, nine (9) years after the agreement was signed. However, some member states have not yet submitted their certificate forms to the ASEAN Secretariat.

The nine (9) protocols of the AFAFGIT 1998 are imperative to international RO-RO shipping development. However, five (5) of those have not yet entered into force including the customs related protocol (refer to Table 4.1). The Ministerial Understanding on the Development of the ASEAN Highway Network Project 1999 has not designated any international RO-RO section in the network (refer to Figure 4.1).

Taking the previous implementation preparation pace into account, it must take a long time to fully implement the agreements signed in the 2000s.

4.3 Subregional Efforts within ASEAN

Transport planning documents and MOUs under BIMP-EAGA and IMT-GT, two subregions within ASEAN, have been reviewed. Such subregional MOUs govern actual cross-border traffic at specific locations and routes with institutional and technical support by related ASEAN transport facilitation agreements and their protocols. The subregional experiences are meaningful for ASEAN RO-RO shipping when it is developed by route.

Table 4.1 Status of Ratification of AFAFGIT
(As of December 2012)

INSTRUMENT	DATES OF SIGNING	DATES OF RATIFICATION BY MEMBER STATES										DATE OF ENTRY INTO FORCE
		BNR	CAM	INA	LAO	MAL	MYM	PHI	SIN	THA	VNM	
TRANSPORT FACILITATION												
ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT)	16/12/98	15/08/00	30/04/99	13/01/00	21/12/99	02/03/99	16/12/98	20/05/99	02/10/00	17/02/99	24/06/99	02/10/00
Protocol 1 Designation of Transit Transport Routes and Facilities	08/02/07	19/10/09	27/10/09	24/11/11	20/06/11			13/11/07		22/06/11	10/10/07	
Protocol 2 Designation of Frontier Posts												
Protocol 3 Types and Quantity of Road Vehicles	15/09/99	08/09/04	09/05/07	23/06/00	19/01/00	24/07/09	21/08/00	25/11/99	02/05/06	19/04/10	15/11/99	19/04/10
Protocol 4 Technical Requirements of Vehicles	15/09/99	08/09/04	09/05/07	23/06/00	19/01/00	24/07/09	21/08/00	26/11/99	02/05/06	19/04/10	15/11/99	19/04/10
Protocol 5 ASEAN Scheme of Compulsory Motor Vehicle Insurance	08/04/01	08/04/02	30/01/02	30/07/02	06/11/02	26/03/02	16/10/03	22/09/03	29/08/02	08/01/03	02/07/01	16/10/03
Protocol 6 Railways Border and Interchange Stations										03/09/12	26/11/12	
Protocol 7 Customs Transit System												
Protocol 8 Sanitary and Phytosanitary Measures	27/10/00	07/08/10	23/05/03	31/12/02	9/5/01	10/08/10	10/10/02	26/11/09	30/03/06	23/8/03	29/3/01	10/08/10
Protocol 9 Dangerous Goods	20/09/02	30/03/04	09/05/07	24/08/03	19/05/03		25/04/03	05/05/03	12/09/07		15/11/02	

(Main Land)

(Archipelago)

Figure 4.1 ASEAN Highway Network

5 THE NORTHERN MALACCA STRAIT CROSSINGS

Belawan (Indonesia) – Penang (Malaysia)	140 n.m. (259 km)
Belawan (Indonesia) – Phuket (Thailand)	242 n.m. (448 km)

RO-RO vessel used for the pilot project in 2005 (Jatra III, 3,123 GT, built in Japan in 1985)

Socio-Economy: North Sumatra, Indonesia, is a populous province of 13 million. It is much bigger than the population of Penang Province of Malaysia (1.6 million) and of Phuket Province of Thailand (0.3 million). On the other hand, the GDP per capita of North Sumatra is less than $ 2,000 which is much lower than Penang ($ 9,000) and Phuket ($ 7,000). As a result, North Sumatra seems to have a strong momentum in labor export. The population statistics of Penang and Phuket do not encompass foreign semi-permanent workers and seasonal workers despite of their presence in the societies.

Trade: North Sumatra mostly trades with Malaysia and Singapore at both export and import. The port of Belawan exported 4.9 million tons and imported 2.4 million tons. The biggest export commodity is vegetable fats and oils. The port of Penang handles much more cargo than the port of Belawan by several times, an export cargo of 12.9 million tons and an import cargo of 15.9 million tons. Lastly, the port of Phuket handles only 0.5 million tons for external trade.

Existing Traffic on the Routes: Wooden hull NCVs regularly ply between Penang and Belawan. A container shipping shuttle service has been revived since May 2012 after a couple of years' suspension. Since 2010, fast passenger shipping service has been suspended. Adversely, air traffic is presently booming at 71 flights per direction weekly and 700 thousand passengers yearly. On the route between Belawan/Medan and Phuket, there is no scheduled cargo and passenger service at both sea and air.

Ports: The port of Belawan is shifting its passenger function from the existing terminal at Ujung Baru to the new terminal at Belawan Lama, near a rail station and an interchange of the Medan – Belawan toll road. When a RO-RO route is opened, this terminal will be used. The port of Penang does not have an international RO-RO terminal. After the consultation meeting with the Penang Port Commission, it was agreed that the Study would design a RO-RO terminal at the multi-purpose wharf of Butterworth Area. The port of Phuket currently receives many passenger ships including international cruise ships.

Routes: Both the routes between Belawan and Penang, and between Belawan and Phuket can accommodate the maximum vessel size of 30,000 DWT with a ship draft of 9.5 meters. On the Belawan – Phuket route, sea condition becomes rough due to strong wind during the south-west monsoon.

Stakeholders: The stakeholders in Belawan/Medan and Penang show a strong interest to open a new RO-RO route. They experienced the pilot RO-RO ship project in 2005 and thus they well understand the critical points, such as the Indonesian customs attitude towards

temporary admission to Malaysian vehicles and no international RO-RO terminal available within the Port of Penang.

Meanwhile, stakeholders expressed contrasting sentiments about the potential trade between Indonesia and Thailand through the Belawan-Phuket route. Some believe trade prospects are small since both countries have similar products. Other local business people, on the other hand, see many opportunities that can be created in opening up trade between Belawan and Phuket. There is a bilateral consensus that a new RO-RO route will contribute to subregional tourism development in the long run.

6 THE SOUTHERN MALACCA STRAIT CROSSING

Dumai (Indonesia) – Malacca (Malaysia)	58 n.m. (107 km)

Image of Small ROPAX Vessel on the Route proposed by Malacca Operator

Socio-Economy: Riau Province, Indonesia, has a population of 5.5 million. The GDP per capita excluding oil and gas is around $ 8,000. Malacca State, Malaysia, shows the same GDP per capita level, around $ 8,000, but its population is only 0.8 million.

Trade: Riau Province shows unbalanced trade statistics even excluding oil and gas, i.e. 15.9 million tons in export and 2.0 million tons in import. In regard to Malaysian trade, Riau Province exports 2.2 million tons while it imports 0.5 million tons. Since there is no general port in Malacca, the trade relation between Riau and Malacca is unknown.

Existing Traffic on the Route: There are fast passenger boats carrying around 90,000 people on the route. They are mostly Indonesians. There is no alternative air service on the route. In 2008, over 100,000 Indonesian tourists visited Malacca, the World Heritage Site, where Indonesia was the third largest country in terms of tourist arrivals. The trade between Riau Province and Malaysia is around 7,500 tons daily. It seems to be mostly done by Riau based small wooden vessels with over 200 GT on the average.

Ports: In Dumai, one domestic ferry terminal is located 20 minutes' drive from the city center. It will be able to receive an international RO-RO vessel with some additions. In Malacca, there is no suitable RO-RO port. According to the State Government, one plan is to modify the proposed cruise terminal jetty off the Melaka Island.

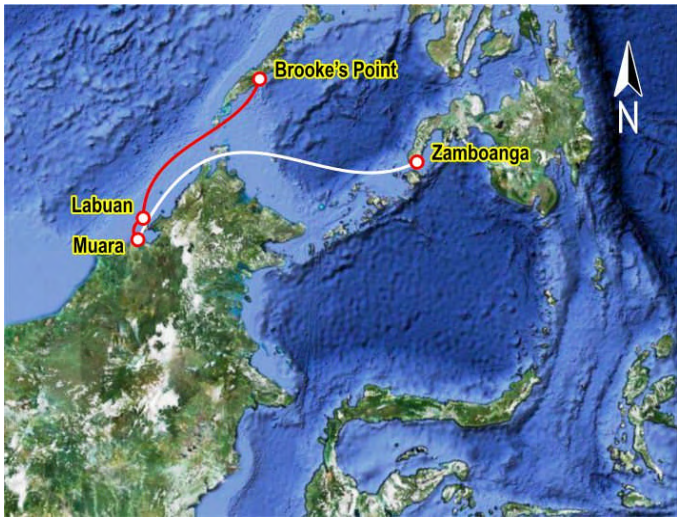
Route: It can allow a vessel of 12,000 DWT at maximum with a ship draft of 8.0 meters. Around January, winds may be stronger due to the north-east monsoon.

Stakeholders: Riau Province and Malacca State engaged the MOU including RO-RO shipping development in 2009. Riau Province sent a couple of missions to Malacca in order to discuss a new RO-RO route. The state government of Malacca has appointed a RO-RO operator.

The Indonesian side might be better prepared to connect to the Malaysian side, since the former already operates domestic RO-RO services in Dumai. Several government-owned and private shipping operators have shown an interest to participate in the Dumai-Malacca RO-RO services. However, they share similar concerns such as on available RO-RO terminal at Malacca, and institutional arrangements including the treatment of Malaysian transit vehicles by Indonesian customs authorities.

7 THE SULU SEA CROSSINGS

Muara (Brunei Darussalam) – Labuan (Malaysia) – Brook's Point (Philippines)	281 n.m. (520 km)
Muara (Brunei Darussalam) – Zamboanga (Philippines)	537 n.m. (995 km)



MV SHUTTLE HOPE (482 GT, built in Japan in 2001) to ply between Muara and Labuan

Socio-Economy: Brunei Darussalam has a modest population of 0.4 million and its GDP per capita is the second largest in ASEAN next to Singapore, $ 30,000. Labuan is a small island under the federal territory of Malaysia with 80 thousand people. Its GDP per capita is $ 9,000. Brooke's Point, Philippines, has also a small population of 60 thousand while the MIMAROPA Region including Brooke's Point shows its low GDP per capita of $1,200. Zamboanga City has a population of 0.8 million and the Region IX's GDP per capita is $ 1,200.

Trade: Since Brunei Darussalam exports crude oil and LNG exclusively, there may be few export cargo when the country is connected with a RO-RO route. The Port of Muara handles various imported goods (0.9 million tons), including mostly consumer goods. Labuan shows a considerable trading volume in spite of its small island economy, i.e. exported cargo (8.8 million tons) and imported cargo (3.8 million tons). The trade supports local oil and gas related activities. The port of Brooke's Point is not active with some scores of thousand tons for both internal and external trade. Particularly, there is no record for export. The port of Zamboanga handles a surprisingly small trading volume of over 0.1 million tons.

Existing Traffic on the Route: A small RO-RO vessel started its operation between Muara and Labuan in October 2010. The daily traffic is stable with over 100 passengers and 20-30 vehicles. The operator intends to increase the frequency from one round trip per day to two round trips per day. There is no shipping service between Labuan and Brooke's Point. The same situation is observed on the route between Muara and Zamboanga. However there is cargo passenger shipping service provided between Zamboanga and Sandakan, Sabah.

Ports: The Serasa Terminal in the Port of Muara has a sufficient RO-RO terminal for a small RO-RO vessel to homeport. On the other hand, the RO-RO terminal in Labuan needs to improve its ramp and other facilities. Both the ports of Brooke's Point and Zamboanga do not have a RO-RO terminal. Zamboanga has a large passenger terminal which handles 3.5 million annually. When opening a RO-RO route, it is an idea to use the existing passenger terminal in an integrated manner.

Routes: The port of Brooke's Point has a shallow water of only 2.3 meters and thus ordinary RO-RO vessels cannot enter.

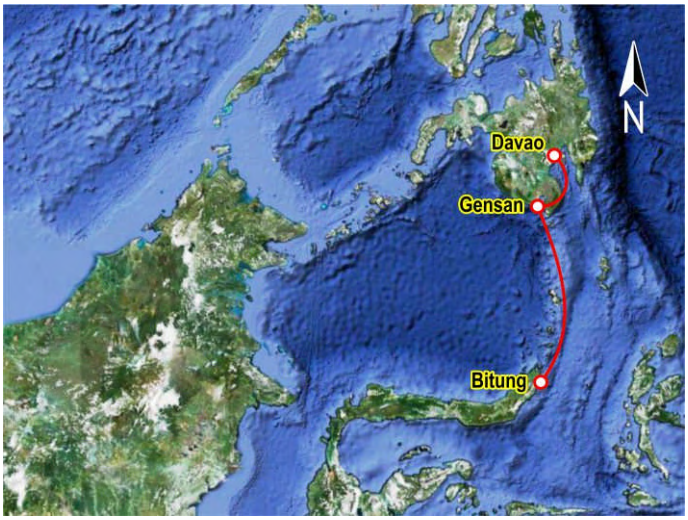
Stakeholders: The local stakeholders in Brunei and Labuan apparently favor the existing Muara-Labuan RO-RO service, which is enjoying sustainable operations and is planning to expand. Since there are no direct trading and any other business experiences between Muara/ Labuan and Brooke's Point or Zamboanga, the Brunei/ Labuan stakeholders did not disclose any business plans associated with these proposed new RO-RO routes.

The Philippine stakeholders, however, are keen on exploring the possible RO-RO connections. The local governments and private sector of Palawan have been waiting and working to establish formal trade relations with Malaysia (Labuan and Sandakan) and/or Brunei. But so far no business action has been taken.

Zamboanga stakeholders also generally welcome the possibility of establishing direct international links to its ASEAN neighbors. Rather than Muara, however, they are more interested to connect to Sandakan, its traditional trading partner for so-called barter trading for many years. Muara seems to be very far and its trading and business opportunities are unknown to the Zamboanga stakeholders.

8 THE PHILIPPINE SEA CROSSING

Davao/General Santos (Philippines) – Bitung (Indonesia)	456 n.m. (845 km)



MV Rimba Tujuh, Semi-container vessel, short-life assignment in 2004

Socio-Economy: Region XI, including Davao City, has a population of 4.5 million and its GRDP per capita is $ 1,900. The Region XII including General Santos City has a population of 4.1 million and its GRDP per capita is $ 1,400. On the other hand, North Sulawesi, including Bitung as a gateway city, has a population of 2.2 million with its GRDP per capita of $ 1,600. The three (3) local economies show a similar level in development.

Trade: There are more than 20 ports widespread in Davao City and thus the general port (Sasa Wharf) does not have a functional centrality. But the port's cargo throughput is 3.3 million tons. The port of General Santos (Makar Wharf) handles 0.8 million cargo in trade. On the other hand, North Sulawesi exports only 0.7 million tons while provincial import is less significant. The port of Bitung handles a trading cargo of 0.4 million tons.

Existing Traffic on the Route: Currently, there is no liner shipping service. In the past, some attempts were made to modernize shipping demand but they failed. Indonesian islands in the middle of the route have some trading activities with South Mindanao, including monthly copra exportation by a small bulk ship, regular purchase of miscellaneous Philippine products by a small general cargo ship and border trade by numerous NCVs in small quantity each. On the route, small air traffic is observed. It is a weekend return flight by a small plane between Davao and Manado on a charter basis.

Ports: Sasa Wharf at Davao City is severely congested and its infrastructure is largely damaged. A RO-RO terminal is planned without a specific schedule. Makar Wharf at General Santos City is as large as Sasa Wharf but it is not crowded and the infrastructure is in good condition. The port of Bitung is bigger than the two Philippine ports. It has a RO-RO wharf with a sufficient parking capacity of 200 vehicles.

Route: Since the three ports are regional hub ports, any RO-RO vessel regardless of size can make a port-of-call.

Stakeholders: Both the public and private sector stakeholders in Philippines and Indonesia welcome the sea transport link between Davao/General Santos and Manado/ Bitung as this would stimulate increased cargo and passenger traffic across the route and boost their local economies. Both the sides have already had various exchange missions to explore trading and business opportunities and socio-cultural linkages. In November 2012, local chambers of commerce and industry of Davao and North Minahasa and others made the MOC (Memorandum of Cooperation) including the Davao – General Santos – Bitung RO-RO link. Local shippers and forwarders at both sides look for trade expansion in line with shipping modernization.

9 THE BORNEO EAST-WEST SEA CROSSINGS

Johor (Malaysia) – Sintete (Indonesia)	321 n.m. (594 km)
Tawau (Malaysia) – Tarakan (Indonesia) – Pantoloan (Indonesia)	363 n.m. (672 km)

Fast passenger craft from Indonesia calling at Port of Tawau

Socio-Economy: Johor State in Malaysia has a population of 3.4 million with its GDP per capita of $ 6,500. West Kalimantan Province in Indonesia, the opposite side across the South China Sea, has 4.4 million people with its low GDP per capita of $ 1,300. At the other side of Borneo Island, 3.2 million people reside in Sabah State in Malaysia and its GDP per capita is $ 5,400. East Kalimantan in Indonesia facing Sabah has a population of 3.5 million and its GDP per capita, excluding oil and gas, is similarly $ 5,600. Lastly, Central Sulawesi Province located the opposite side across the Strait of Makassar has 2.6 people with its low GDP per capita of $ 1,600.

Trade: Tanjung Belungkor, Johor State, now accommodates only passenger ships without trade. Sintete is a small river port in West Kalimantan. The port is engaged in small-scale export of palm oil. Tawau, the third largest port in Sabah, handles grains for transshipment and barter trade with Indonesia. Tarakan in East Kalimantan has trading ties with Malaysia, the Philippines and Thailand with a small quantity of 0.1 million cargo. Pantoloan in Central Sulawesi exports cacao through Jakarta and Surabaya.

Existing Traffic on the Routes: No shipping traffic is observed between Johor and Sintete. No air passenger traffic is also recorded between Johor and West Kalimantan. On the Tawau

– Tarakan route, two fast passenger boats serve daily and frequent barter trade transactions are also observed, i.e. 40 tons per day. On the Tarakan – Pantoloan route, there is neither regular domestic ferry service nor liner cargo service.

Ports: The Tj. Belungkor Ferry Terminal can receive small RO-RO vessels but the port of Sintete does not have a RO-RO terminal. Both the ports of Tawau and Tarakan do not have international RO-RO terminals. When a new terminal is constructed, local tidal variation of over 3.5 meters must be duly considered. In Tarakan, the existing domestic ferry terminal can be used with necessary additions.

Routes: Due to its river port nature, the Port of Sintete can accommodate vessels of less than 1,000 GRT. On the route among Tawau, Tarakan and Pantoloan, vessels up to 30,000 DWT with a draft of 9.5 meters can be used.

Stakeholders: Stakeholders in Johor see the connection with Indonesian Borneo as an opportunity to attract more tourists, for sourcing workers for its booming industries, and possibly stimulating trade. Local stakeholders in Sintete/ Sambas are aware of how cargo transport from their area has shifted over the years from Sintete Port to the much bigger and better Pontianak Port. They feel that the possible opening of the Sintete-Johor sea transport route could support its trade development.

There is significant barter trading and passenger movement between Tawau and Nunukan/ Tarakan, using NCVs and small passenger ships, but no observed traffic between Tarakan and Pantoloan. Local stakeholders, while expressing contrasting views, generally see little potential for RO-RO shipping along the Tawau-Tarakan-Pantoloan route at present.

10 COUNTRY SURVEYS FOR LEGAL AND INSTITUTIONAL FRAMEWORK

The country surveys were conducted by the team of ASEAN experts in order to understand RO-RO shipping related legal and institutional frameworks in all ASEAN member states. The survey includes the following items:

- Domestic laws in relation to international RO-RO shipping;
- Ship registry;
- The status of accessions to international maritime conventions;
- The status of accessions to international conventions on road transport and customs;
- The status of ratifications to ASEAN transport agreements and their protocols;
- The achievement of the ASEAN Highway Network Project;
- The status of ratifications to subregional transport documents; and
- The institution to admit road vehicles to be disembarked from a RO-RO vessel.

Among them, Chapter 4 of this report expresses international institutional development including relevant international conventions, ASEAN agreements and subregional institutional efforts within ASEAN.

The results of country surveys are summarized, highlighting the most critical institutional issue in international RO-RO shipping development in ASEAN – the temporary admission of road vehicles into the host country.

(1) Brunei Darussalam

Brunei Darussalam made a bilateral agreement with Malaysia in October 2010 to introduce the first international RO-RO service in ASEAN, i.e. Brunei flagged MV Shuttle Hope serving between Muara and Labuan. The agreement has exempted the operator (PKL Jaya Sdn Bhd) from paying marine charges and terminal tariff while the operator is required to provide adequate insurance coverage for passengers onboard. The agreement represents the combined effort of the two countries to implement the following subregional MOUs:

- The BIMP-EAGA MOU on Establishing and Promoting Efficient and Integrated Sea Linkages in 2007; and
- The BIMP-EAGA MOU on Transit and Inter-state Transport of Goods in 2009

Brunei Darussalam's Customs Order 2006 and Administrative Rules allow for temporary admission of foreign road vehicles for an initial period of three (3) months. The amount of security required for such temporary admission is equivalent to the duty involved on the vehicle. Despite the above standard customs requirements, the country has exempted security deposit by virtue of bi-lateral and subregional arrangements with Malaysia and Indonesia. It is adapted to the RO-RO shipping route between Muara and Labuan, Malaysia.

Brunei Darussalam recognizes Malaysia's third party car insurance but not Indonesia's, as the coverage amount of the latter is considered to be too low. The country does not allow left-hand drive vehicles and thus vehicles from left-hand drive countries, such as the Philippines, are not allowed to run through.

(2) Cambodia

Cambodia is among the contracting countries to the 1956 Customs Convention on the Temporary Importation of Commercial Road Vehicles. The relevant domestic law allows temporary admission of road vehicles free of import duty for a period of up to twelve (12) months. Foreign road vehicles are allowed only to travel on the transit and inter-state routes designated under international agreements which Cambodia is party to, such as the ASEAN Highway.

Cambodia participates in ASEAN transport agreements and subregional undertakings, such as the GMS – CBTA, while the country made bi-lateral MOUs with adjoining countries to facilitate cross-border traffic. For instance, the arrangement between Bavet and Moc Bai, Cambodia and Vietnam agreed lately to increase the quota for commercial vehicles for cross-border operation to 500.

However, Cambodia has not experienced receiving an international RO-RO vessel.

(3) Indonesia

Indonesia permits temporary admission of road vehicles to its territory for a maximum period of three (3) years. The relevant laws require the vehicle owners/operators to pay a customs security equivalent to the import duties and taxes of the vehicle. The security may be in the form of bank guarantee, customs bond or cash guarantee. The vehicle can exit Indonesia through a Customs Office other than which it entered.

Left-hand drive vehicles need to secure special permit prior to entering the country.

The West Kalimantan Province of Indonesia operates more flexible road cross-border transport management with Sarawak State of Malaysia and Brunei Darussalam. Since the 1980s, mutual recognition of road transport vehicles has been done under the bi-lateral cooperation framework – 'SOSEK MALINDO or Socio-Economic Exchange for Malaysia – Indonesia'. The following BIMP-EAGA MOUs in the late 2000s allow Brunei Darussalam to participate in such land cross- border management:

- The BIMP-EAGA MOU on Cross-Border Movement of Commercial Buses and Coaches in 2007
- The BIMP-EAGA MOU on Transit and Inter-state Transport of Goods in 2009

As a result, Indonesia currently allows transit vehicles of Brunei Darussalam and Sarawak State, Malaysia.

(4) Lao PDR

Under the relevant laws, Lao PDR allows temporary admission of road vehicles for a period of two (2) years. The drivers of the vehicles must pay a security of 120% of customs duty and other payable fees.

Despite of those regulatory setting, in practice, there are five routes designated as the Transit Transport Routes under the ASEAN Highway Network Project. Lao PDR broadly allows transit and inter-state vehicles by way of ASEAN, GMS, and bi-lateral agreements and MOUs. For instance, the agreement with Vietnam in 2009 opens ten (10) cross-border posts with eleven (11) routes for the vehicles of Laos and Vietnam. As far as bus service concerned, 33 inter-state routes are open.

Foreign vehicles entering Lao PDR must have third-party vehicle insurance. The insurance may be purchased at the designated border check points.

(5) Malaysia

Malaysia allows temporary admission of road vehicles to its territory for an initial period of three (3) months with possible extension of up to 12 months. Prior to entering Malaysia, the road vehicles must have been registered. The relevant laws require the vehicle owners/operators to pay an amount of security equivalent to the duty involved on the vehicles. The security may be in the form of bank guarantee, general bond or cash.

Despite of those regulatory setting, in practice, Malaysia has a less restrictive cross-border transport regime when dealing with vehicles from Singapore, Brunei Darussalam, Thailand and Indonesia. For example, Malaysia recognizes domestic driving licenses of the four connecting countries. Malaysia recognizes Singapore and Brunei Darussalam on their vehicle insurance policies. However, there is no such mutual recognition agreement between Malaysia and Thailand and between Malaysia and Indonesia. There are language related restrictions imposed on Thai vehicles such as an English translation of car registration and a translation of car plate into the roman alphabets. A translated license plate sticker may be made and purchased at border crossings.

In Malaysia, left-hand drive vehicles are required to have a ‘Left Hand Drive’ sticker on their rear.

(6) Myanmar

Myanmar may allow temporary admission of foreign road vehicles. The length of stay of the vehicles is determined by the Ministry of Commerce in accordance with the Investment Law. No customs bond or security is imposed on the vehicles.

Myanmar is a country of left-hand drive but many vehicles are right-hand drive. There has been no ban on the importation of new and second-hand right-hand drive vehicles from Japan and Thailand.

Presently there is no formal inter-state and transit transport operation between Myanmar and other ASEAN member states. Myanmar’s experience in allowing foreign motor vehicles to enter its soils was mainly through its involvement in the ASEAN-India Car Rally in 2004.

(7) Philippines

Unlike its many ASEAN counterparts, the Philippines has not entered into any bi-lateral road transport agreements with other ASEAN countries. Though it is a signatory to the BIMP-EAGA transport MOUs, there is presently no Filipino transport operator doing business under the MOUs.

There is no specific law in the Philippines that governs the temporary admission of private road vehicles. Under the Philippine Customs regulations, motor vehicles including trailers and parts are dutiable items. Vehicles that are brought in by RO-RO vessels are treated as import goods and therefore subject to a relatively long process of customs clearance and paper works. The issuing body of import permit is the Philippine Bureau of Import

Service under the Department of Trade and Industry. Right-hand drive vehicles are strictly not permitted to enter the country. Vehicles that are five years old or older are not allowed to be brought in.

(8) Singapore

Singapore allows temporary admission of road vehicles to its territory. The relevant laws do not specify how long the vehicle can be in the country. No customs duty is imposed on the vehicle and no customs guarantee is required.

Singapore Traffic Police recognizes driving licenses issued by ASEAN member states. For a foreign driving license that is not written in English, English translation is required. Singapore does not allow left-hand drive vehicles from being imported for personal local registration. But temporary usage by tourists of left-hand drive vehicles is allowed.

Foreign registered vehicles entering Singapore must have a valid insurance coverage for the period of the vehicles stay in Singapore, a valid road tax and an Autopass Card for paying toll and parking charges and Electronic Road Pricing (ERP) fees.

(9) Thailand

Thailand is located at the center of the ASEAN main land where six (6) transit transport routes of the ASEAN Highway Network Project run and cross each other. The country deals with road cross-border vehicles in accordance with various agreements among ASEAN, GMS, tri-parties and bi-lateral countries as well as the MOUs by cross-border routes.

According to the relevant laws, Thailand allows temporary admission of road vehicles free of import duty in the country for a period of two (2) months, with possible extension of up to six (6) months. The vehicle owners/operators are required to pay a security in the form of a bank guarantee or cash amounting to 120 % of tax. With individual arrangements of road cross-border vehicles, in many cases, foreigners entering Thailand by road vehicles are required to present four (4) types of documents, i.e., passport, car registration document, the Thai arrival/departure card and a completed manifest when there are accompanying passengers.

Thailand is a left-hand drive country but it allows both types of vehicles on its roads. The country does not recognize insurance of other ASEAN member states. Vehicle operators/owners are required to purchase third party liability insurance at the Thai side of border crossings.

(10) Vietnam

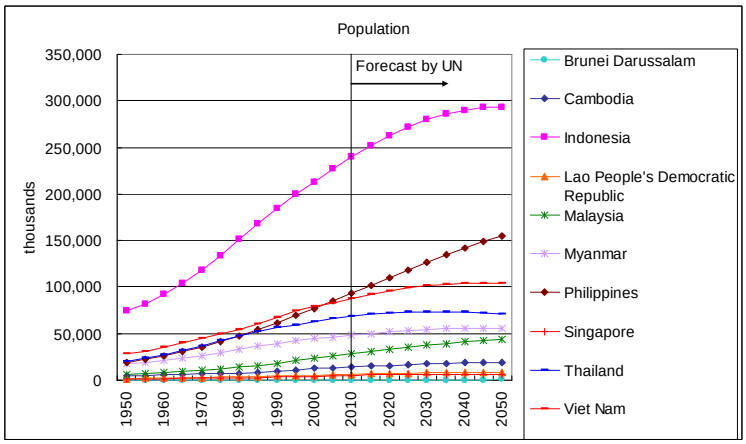
As already reported in Cambodia and Lao PDR, Vietnam facilitates road cross-border traffic by means of ASEAN, GMS and bi-lateral agreements and specific route-wide MOUs. To promote tourism, the Agreement among Thailand, Lao PDR and Vietnam on the Operation of the Tourism Road Transport was signed in 2007.

Vietnam is a signatory to the GMS Cross-Border Transport Agreement (CBTA). For initial implementation of the CBTA, Vietnam has concluded tri-lateral and bi-lateral MOUs. There is mutual recognition of vehicle registration certificate, registration plate and inspection certificated under the MOUs. The allowed period for the temporary admission of road vehicle without payment of import duties and taxes is 30 days. The quantitative quota is 500 vehicles for each country. Customs guarantee in the form of security is still required. In that case, a designated organization such as national forwarders' association may give a guarantee.

11 DEVELOPMENT OPPORTUNITIES OF ASEAN RO-RO SHIPPING

11.1 Socio-Economic Development in ASEAN

The Study has collected and analyzed socio-economic development perspectives in relation with ASEAN RO-RO shipping development prepared by various institutions. They include population, GDP, trade, container transportation and visitor arrivals.

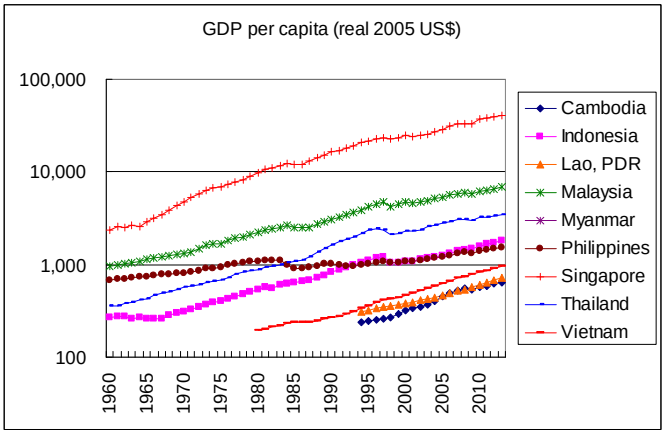


Source: UN Population Forecast

Figure 11.1 Population Forecast in ASEAN

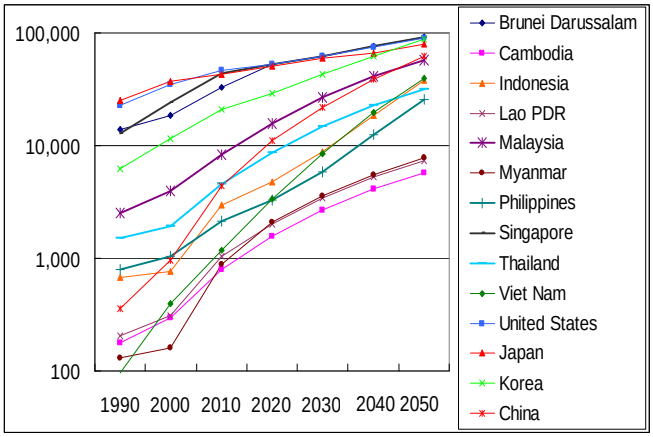
According to the UN population forecast, 756 million people will reside in the ASEAN region in 2030 with gradual increase from 592 million in 2010 (refer to Figure 11.1).

Similar to population, the Member States have historically showed a growth trend in GDP per capita 8refer to Figure 11.2). The Study assumes future GDP growth by country under the scenario that country disparity would be gradually narrowed in the region (refer to Figure 11.3).



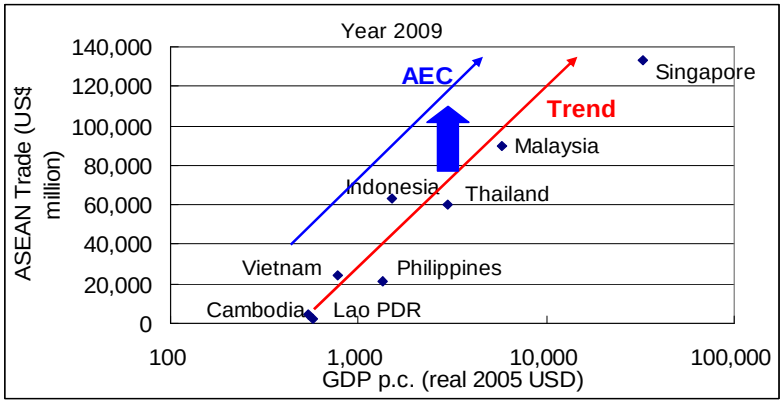
Source: Various country data

Figure 11.2 Trend in GDP per Capita



Note: Assumed by the JICA Study Team based on country data

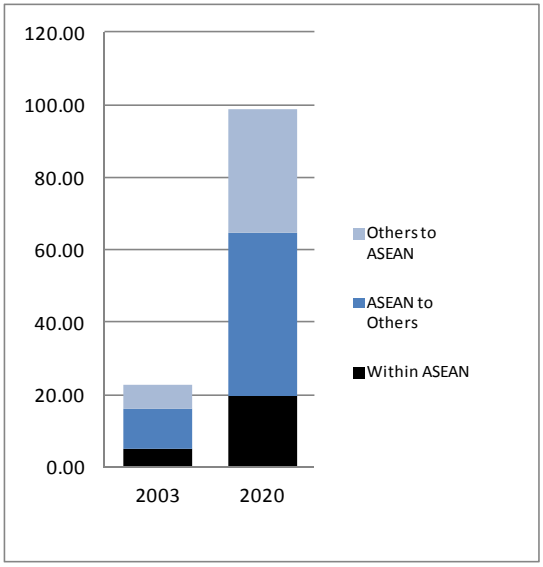
Figure 11.3 Growth Assumption in GDP per Capita



Source: IMF, 2010

Figure 11.4 Direction of Intra ASEAN Trade

ASEAN trade exceeded $ 2 trillion in 2010. The intra ASEAN trade accounted for 27% in import and 25% in export. Figure 11.4 shows the relation of ASEAN trade and GDP per capita among the Member States. The ASEAN Economic Community (AEC) envisages the realization of 'one market and production base' in the region which facilitating trade.



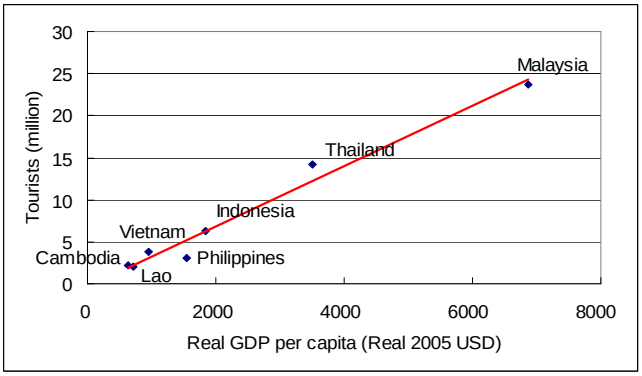
Source: NILIMJ Research Report, 2009
Unit: Million TEU

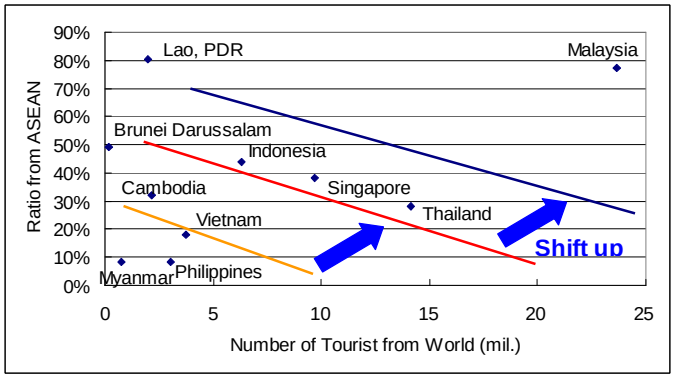
Figure 11.5 Container Traffic in ASEAN

According to the National Institute for Land and Infrastructure Management of Japan (NILIMJ) in 2009, the container trade volume in relation to ASEAN was 22.6 million TEU in 2003. It is projected at 98.9 million TEU in 2020. The most significant increase is expected at the container flow from other regions to ASEAN. Intra-ASEAN container traffic, which is the most related demand to ASEAN RO-RO shipping, is projected at 19.5 million TEU in 2020 from 5.0 million TEU in 2003. (Refer to Figure 11.5)

Compared with the RO-RO shipping experiences in East Asia and EU, such dynamic intra-regional container movement will be able to pave the way for a regional RO-RO shipping network.

There is a strong relation between the number of tourist arrivals and GDP per capita in ASEAN (refer to Figure 11.6). In the future, two indicators are expected to grow in parallel with economic growth. They are tourist arrivals as a whole and intra-ASEAN tourists (refer to Figure 11.7).





Source: Various country tourism statistics in ASEAN

Figure 11.6 Tourists and GDP per Capita

Figure 11.7 Growth of Tourism Markets

11.2 A Potential Alternative to Container Shipping

The Study has examined a possibility of freight RO-RO shipping route in ASEAN based on other regions' experiences introduced in Chapter 2 which indicates a competitive relation between container shipping and RO-RO shipping in East Asia and Europe. The following are adopted data and indicators:

- Container traffic unlinked O-D matrices in Asia including ASEAN (the years of 2003, 2020 by NILIMJ Research Report 2009);
- Modal shares of seaborne container traffic between container shipping and RO-RO shipping – 88:12 (from the East Asia's experience); and
- A model of modal share by RO-RO shipping in relation with route distance developed by the UK-EU experience

As a result, the Study has identified six (6) potential routes without any competition with land transport and 15 routes where land transport may compete. Regarding the surveyed eight (8) routes in the Study, the strait crossing between Sumatra Island and the Malay Peninsula is regarded as a possible freight RO-RO route.

The RO-RO shipping practices in other regions in Chapter 2 indicate that ROPAX routes are generally shorter than freight RO-RO routes and they meet more diversified local needs. It implies that short-distance routes among the potential RO-RO shipping routes based on container cargo identified in this section would become ROPAX routes.

Table 11.1 Potential O-D Pairs for Freight RO-RO Shipping

(No competition with land transport)

O-D Pair (Both Ways)		RO-RO Demand (TEU)	
		2003	2020
Sarawak, Malaysia	Singapore	20,406	65,851
Sabah, Malaysia	Singapore	16,401	52,927
Sumatra, Indonesia	Singapore	6,101	20,848
Java (West), Indonesia	Singapore	7,759	26,513
Kalimantan, Indonesia	Singapore	2,596	8,869
Sumatra, Indonesia	Selangor and KL, Malaysia	1,431	7,507

(Competition with land transport)

O-D Pair (Both Ways)		RO-RO Demand (TEU)	
		2003	2020
Selangor and KL, Malaysia	Singapore	51,152	165,073
Johor, Malaysia	Singapore	38,846	125,360
Perak, Malaysia	Singapore	21,334	68,847
Kedah, Malaysia	Singapore	17,199	55,502
Kelantan, Malaysia	Singapore	16,744	54,034
Pahang, Malaysia	Singapore	15,820	51,053
Penang, Malaysia	Singapore	13,718	44,269
Terengganu, Malaysia	Singapore	11,085	35,772
Negeri Sembilan, Malaysia	Singapore	10,459	33,752
Malacca, Malaysia	Singapore	7,855	25,350
Singapore	Bangkok, Thailand	6,063	21,375
Johor, Malaysia	Bangkok, Thailand	2,750	12,556
Selangor and KL, Malaysia	Bangkok, Thailand	2,720	12,419
Perlis, Malaysia	Singapore	2,116	6,830
Sabah, Malaysia	Brunei	525	5,075

Note: No shaded O-D pairs are considered to have higher potentials.

Source: Estimated by JICA Study Team based on NILIMJ Research Report 2009

11.3 RO-RO Shipping System in ASEAN

(1) RO-RO Ship Size and Type

RO-RO ship is characterized in terms of size and type. Ship size is defined by the matrix of route distance and sea condition while ship type depends on marketing strategy and anticipated demand.

ASEAN selected 8 RO-RO shipping candidate routes for the Study. When classifying these 8 routes by the ship size matrix of distance and location, some characteristics are found as follows: (Refer to Figure 11.8)

- 7 routes are short and middle distance routes and only one for long distance over 400 nm (741 km).
- Their oceanic conditions also vary encompassing bay area, strait and outer sea conditions.

The route classification results reveal difficult ship assignment on some routes. For example, the Muara – Labuan – Brooke's Point route consists of the short-distance and bay area section and the middle-distance and outer sea section. A handy RO-RO ship is desirable in the former section while the latter section requires a bigger ship with enough seaworthiness across the ocean. It is almost impossible to design one RO-RO ship to fit on the two sections. Similar difficulty is found on the Tawau – Tarakan – Pantoloan route.

In the case of the Davao – General Santos – Bitung route, both the divided sections belong to middle-distance and one vessel may serve the whole stretch. The vessel must have enough seaworthiness at the outer sea to connect with Bitung. It may be over design when it serves only between Davao and General Santos.

(2) RO-RO Terminal and Facilities

RO-RO vessels are expected to arrive at and depart from a terminal on schedule. Vehicles and passengers may get on and off the vessel at a terminal and pass through the road in the port area day and night. Therefore, the safety of vessels, vehicles and passengers is the most important factor in planning, design and operation.

The location of a terminal shall be decided based on the features of RO-RO service, conditions of the channel and basin, the required scale and usage conditions of the terminal, the traffic lines in the port and access conditions to the hinterland considering the relation to the location and use of the other port facilities. In addition, from the viewpoint of users, convenience, seamless port procedures and a comfortable environment shall be arranged.

The terminal shall have a berth, loading/discharging facilities for vehicles, parking areas of waiting for boarding, a gangway, check-in gate and CIQ offices (inbound and outbound), a road to the terminal in the port and approach and exit gates and facilities for securing safety and to meet the ISPS Code. In the case of a RO-RO terminal, boarding facilities and concourse of passengers, and a passenger building are necessary. The types and scales of facilities shall be decided based on the type and size of design vessels, the number and size of design vehicles and the number of passengers, etc.

For example, in ASEAN, there are international RO-RO terminals such as the port of Muara (Serasa Terminal) for a small size ROPAX vessel and the port of Johor (Tanjung Belungkor) for a middle size ROPAX vessel. But no terminal for a large size vessel over 180 m long is available.

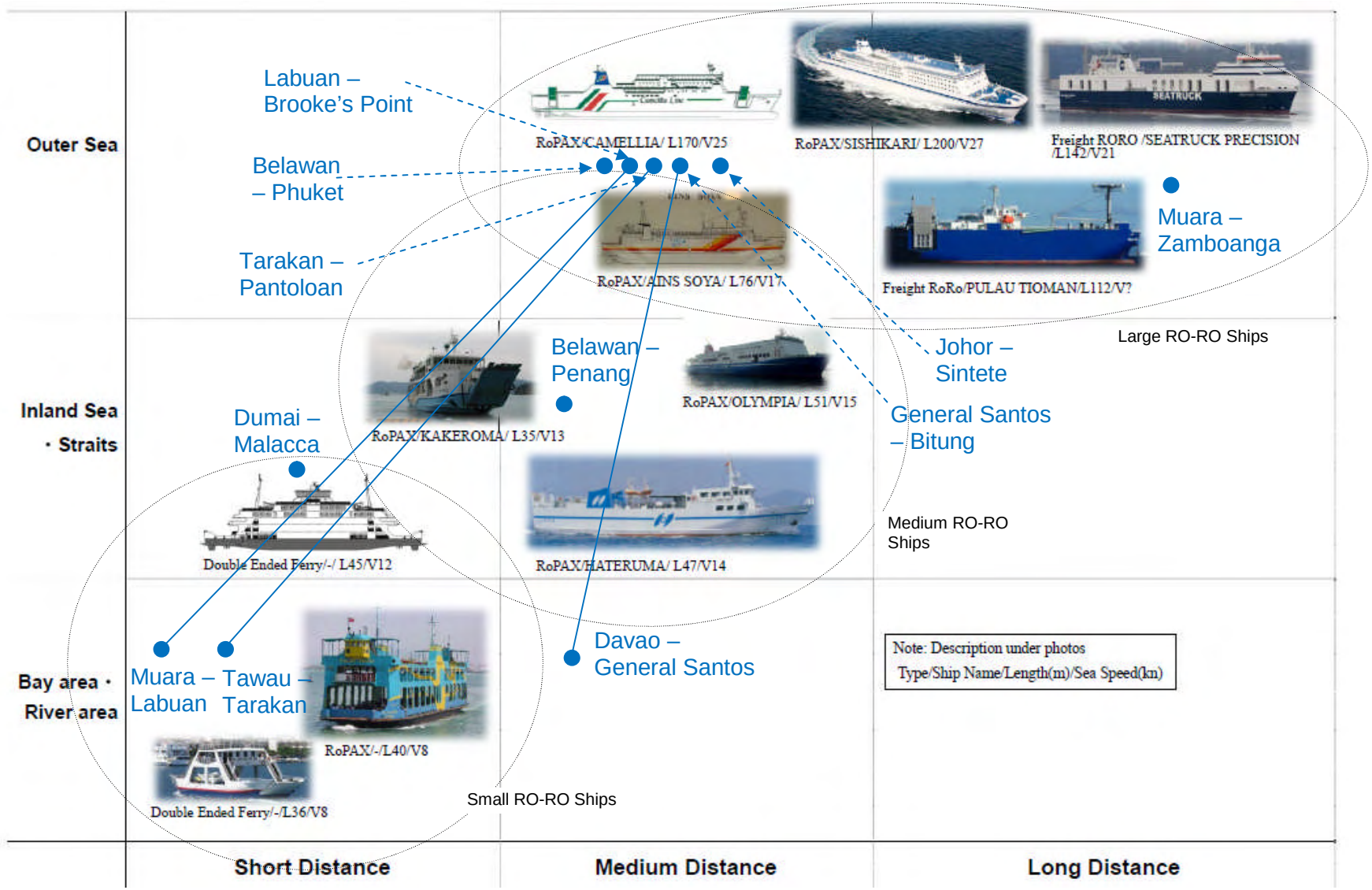


Figure 11.8 Matrix of RO-RO Ship Types by Route Location and Distance and the Surveyed Routes selected by ASEAN

12 DEVELOPMENT DIRECTIONS OF THE SURVEYED ROUTES

12.1 Development Directions by Route

Route (distance)	Traffic Demand	Infrastructure Development	RO-RO Route Development Direction
BELAWAN - PENANG (140 nm or 259 km)	• 502 TEU (daily in 2015) • 382 passengers (daily in 2015)	(Belawan Port) • Additions and adaption to international RO-RO vessels at the new Passenger Terminal (Belawan Lama) (Penang Port) • Site selection with necessary improvement for international RO-RO terminal at the Port of Penang	• The RO-RO shipping pilot project in 2005 will be carefully reviewed particularly on the identified issues such as the Indonesian customs' operation on foreign temporary vehicles and no international RO-RO terminal at Penang. • Taking route conditions into account, middle to large ROPAX vessel will be examined. • An attractive route development plan will be formulated under a PPP scheme since there are potential operators. • Marketing efforts will be made to find passengers in vehicles and RO-RO suited cargoes among the large existing sea-borne traffic on the route.
BELAWAN - PHUKET (242 nm or 448 km)	• Inadequate traffic demand due to no existing traffic and no likely induced traffic	(Belawan Port) • Additions and adaption to international RO-RO vessels at the new Passenger Terminal (Belawan Lama) (Phuket Port) • Additions and adaption to international RO-RO vessels such as CIQS	• On the route between Belawan and Penang, the Study does not find any likely shipping traffic in the near future. On the route between Penang and Phuket, however, it may take part of the increasing road cross-border traffic especially tourism bus coaches, on the Malaysia - Thai borders into new RO-RO service. • In the past, a Catamaran-type RO-RO vessel was assigned on the Penang - Phuket route. The service was suspended due to rough sea conditions during the monsoon season. A middle to large ROPAX can cope with such route conditions.
DUMAI - MALACCA (58 nm or 107 km)	• 150 tons (daily in 2015) • 300 passengers (daily in 2015)	(Dumai Port) • Additions and improvement of the existing domestic ferry terminal so as to accommodate international RO-RO vessels • Construction of the Dumai - Pekanbaru Toll Road (ASEAN Highway No.25)	• Since there are potential operators in Indonesia and Malacca State appoints one operator, the business environment seems high. • Critical paths for successful implementation are the Indonesian customs' operation on foreign temporary vehicles and the Malacca's RO-RO terminal to accommodate international RO-RO vessels. • Taking port capacity at the Dumai side into account, small ROPAX vessel is suitable on the route.

Route (distance)	Traffic Demand	Infrastructure Development	RO-RO Route Development Direction
		(Malacca Port) • Additions to the proposed international cruise terminal jetty such as RO-RO ramp	• Marketing efforts will be made to find passengers in vehicles and RO-RO suited cargoes.
MUARA – LABUAN – BROOKE'S POINT (20 nm or 37 km, 261 nm or 483 km)	• 50 tons (daily in 2015) • 440 passengers (daily in 2015) • Inadequate traffic demand due to no existing traffic and no likely induced traffic on the route Labuan – Brooke's Point	(Muara Port) • No improvement necessary at the Serasa Terminal to accommodate small RO-RO vessel (Labuan Port) • Necessary improvement at the RO-RO terminal including ramp and other land facilities (Brooke's Point Port) • The port hardly accommodates oceangoing RO-RO vessels due to shallow depth. New development of RO-RO terminal with an adequately deep access channel at an adequate site of the port	• Increased RO-RO service will be provided between Muara and Labuan. • Although shipping demand is unforeseeable on the whole stretch between Labuan and Brooke's Point (261 nm), active trade by NCVs partly on the route is reported. It is suggested to elaborate modern shipping serve on a shorter route on the corridor where at least NCV trade is currently robust.
MUARA - ZAMBOANGA (537 nm or 995 km)	• Inadequate traffic demand due to no existing traffic and no likely induced traffic	(Muara Port) • No improvement necessary at the Serasa Terminal to accommodate small RO-RO vessel (Zamboanga Port) • New development of RO-RO terminal at an adequate site of the port	• The route is the longest among the surveyed routes but the demand is small. No backload cargo is expected from Brunei Darussalam. • There is international cargo shipping service between Zamboanga and Sandakan which is mostly equivalent to the northern half of the route. According to NILIMJ projection, this section will attract container demand of 24,543 TEU in 2020 if RO-RO service is provided. • It is suggested the first opening RO-RO shipping route between Zamboanga and Sandakan. Next, the route will be extended to the west coast of Borneo and finally accessible to Muara.
DAVAO – GENERAL SANTOS - BITUNG (154 nm or 258 km, 302 nm or 559 km)	• 29 TEU (daily in 2015) • Onboard drivers plus a small number	(Davao Port) • The Port of Davao (Sasa Wharf) hold a plan to construct small RO-RO terminal but the site is currently occupied with illegal settlers. Since the port infrastructure is deteriorated, rehabilitation deserves priority.	• Past attempts to introduce modern shipping eventually failed due to lack of bi-lateral preparation and demand shortage. Collaboration works between both sides must be highly appreciated at public and private sectors' levels. • The Port of Davao suffers from poor infrastructure maintenance. If seaway is selected, the inter-city route between Davao and Gensan must be detoured by 285km which is much longer than the intercity road

Route (distance)	Traffic Demand	Infrastructure Development	RO-RO Route Development Direction
		• Improvement of the Davao – GENSAN road (ASEAN Highway No. 26)	of 161km. Therefore, Gensan is selected as the port of South Mindanao. • There are small-scale trading activities by small cargo ships and NCVs at Tahuna, the Sangihe islands. New RO-RO service will be able to exploit island demand when occasionally dropping by Tahuna Port. • On the route, cargo demand is uncertain but passenger demand is questionable. Taking route conditions into account, middle RO-RO vessel with minimum passenger space will be examined.
		(General Santos Port) • The Port of General Santos (Makar Wharf) has RO-RO ramp. A site for vehicular movement and parking will be expanded behind the ramp into unused land and others. • Improvement of the Davao – GENSAN road (ASEAN Highway No. 26)	
		(Bitung Port) • Additions and improvement of Pier II for international RO-RO terminal at the Port of Bitung • Construction of the Manado – Bitung toll road	
JOHOR - SINTETE (321 nm or 594 km)	• Inadequate traffic demand due to no existing traffic and no likely induced traffic	(Johor Port) • Tj. Belungkor Ferry Terminal (TBFT) has RO-RO facilities. When receiving a larger RO-RO vessel than the existing capacity, necessary improvement will be done.	• Under the current situations, almost no converted traffic and induced traffic is anticipated on this international route. On the other hand, there is a domestic route between Sintete and the ports in the Riau Archipelago near Johor. This domestic route suffers from demand shortage and thus the route is subsidized. • Since a domestic route is easier to develop and maintain than an international route, it is suggested to vitalize such a domestic route first. For the time being, shipping access to Johor market will be promoted from West Kalimantan through the ports in the Riau Archipelago.
		(Sintete Port) • Sintete is a small and shallow river port without RO-RO terminal. Dredging access channel and development of RO-RO terminal to receive international RO-RO vessel • Rehabilitation of deteriorated sections on the long access road from Pontianak, the provincial capital (200km)	

Route (distance)	Traffic Demand	Infrastructure Development	RO-RO Route Development Direction
TAWAU – TARAKAN - PANTOLOAN (82 nm or 152km, 281 nm or 520km)	• 60 tons (daily in 2015) • 70 passengers (daily in 2015) • Inadequate traffic demand due to no existing traffic and no likely induced traffic on the route Tarakan – Pantoloan	(Tawau Port) • Development of a new RO-RO terminal at an adequate site in the port • A RO-RO terminal should be designed to consider safe service for small RO-RO vessel with big tidal change. (Tarakan Port) • Additions and improvement of the existing domestic ferry terminal (Juwata, Tarakan) when it accommodates an international RO-RO vessel • When using Malundung Port near the Tarakan city center, a new RO-RO terminal will be developed. • A RO-RO terminal should be designed to consider safe service for small RO-RO vessel with big tidal change. • A new bridge between Tarakan Island and Kalimantan (Pantoloan Port) • Considering no RO-RO terminal at Pantoloan Port, using the Taipa ferry terminal nearby in the case of small RO-RO vessel • Development of a new RO-RO terminal at Pantoloan Port in the case of middle to large RO-RO vessels	• Since the Tawau – Tarakan route has stable demand of both passenger and cargo, small ROPAX vessel will be examined. • Since there is an alternative air service between Tawau and Tarakan, the existing sea passenger must prefer lower cost. New RO-RO shipping may be slower than the existing fast passenger boat service. It is important to set passenger tariff at a lower level. • As a measure to expand demand, it is suggested to set diversified routes – some RO-RO trips call Nunukan on the way. • The necessary conditions to open a RO-RO route, international RO-RO terminals and efficient CIQS service at both the sides. • On the Tarakan – Pantoloan route, there is no domestic ferry route. It is suggested to open a domestic RO-RO route first. When the cargo volume from Central Sulawesi to Sabah becomes significantly sizeable, international RO-RO service will be discussed between Tawau and Pantoloan probably via Tarakan.

The relation of some surveyed routes with existing shipping routes is illustrated in Figure 12.1.

(Red) *The Survey Route between Zamboanga and Muara*
(Blue) *The existing international cargo pax shipping route between Zamboanga and Sandakan*

(Red) *The Survey Route between Johor and Sintete*
(Blue) *The existing domestic cargo pax shipping route between Sintete and the ports in the Riau Archipelago*

(Red) *The Survey Route between Tawau, Tarakan and Pantoloan*
(Blue) *The existing domestic ferry routes between East Kalimantan and Central Sulawesi*

Figure 12.1 Some Surveyed Routes with Existing Shipping Routes Nearby

13 PRIORITY ROUTES

13.1 Selection Criteria

The Brunei Action Plan (ASEAN Strategic Transport Plan) 2011-2015 describes RO-RO shipping development at two phases: by 2012 this Study would be conducted and by 2015 the proposed measures of the Study shall be implemented.

The Study has surveyed and analyzed eight (8) RO-RO shipping candidate routes. The list originally came from the TOR prepared by ASEAN with some amendments during the deliberation on the Inception Report.

In the previous chapters, the Study observed that the candidate routes vary among potential demand, available infrastructure and institutional preparedness. The situations show far away from practical conditions to implement RO-RO shipping at all the candidate routes by 2015.

An idea of priority routes added into the Study means the routes to be identified for possible early opening by 2015 and their selection criteria were indicated in the Inception Report:

(1) There must be existing traffic and part of them would be diverted to RO-RO shipping;

(2) RO-RO shipping service can be introduced by 2015 as a sustainable transport system, consisting of vessel, terminal, access road and others; and

(3) Route countries commit to provide efficient CIQS services and an attractive regulatory framework for RO-RO shipping operators in their investment planning and marketing.

In addition, some associated factors are considered under the context of the Study – Japan's technical assistance and joint undertaking with ASEAN:

- To appreciate local enthusiasm to introduce international RO-RO shipping service: Local enthusiasm is defined to prepare RO-RO shipping service, conduct a pilot project and discuss such undertakings at the route connecting countries and local economies;
- To select different types of RO-RO vessels to enhance technical assistance effect: RO-RO shipping has a variety of types in terms of route, demand and assigned vessel. Provided that priority routes would be studied by limited resources, different shipping types could be selected to enhance technical assistance effect; and
- To evaluate business profitability and sustainability: The priority routes which would be developed by 2015 must have sound financial viability to continue operation in a sustainable manner.

13.2 Route Evaluation

The evaluation results are tabulated in Table 13.1.

The results show that there is no ideal candidate route which may be rated triple-A in terms of demand, infrastructure and institutional readiness.

For early implementation, two Malacca Strait crossing routes seem viable since they have likely convertible traffic. However, Malaysia has a port issue and Indonesia has an institutional issue to be overcome by 2015.

It is observed that the Dumai – Malacca route has higher business viability than the Belawan –Penang route because the route distance and calmness allows small ROPAX. On the other hand, middle to large ROPAX is suitable on the Belawan – Penang route taking longer distance and seasonal rough sea conditions into account. It must require much more marketing efforts to make it financially sustainable

Among the routes which are ranked B in demand, the route between Bitung and General Santos has few port issues since they are the rank B ports. Davao Port (Sasa Wharf) is

obsolete and seriously deteriorated. Without sufficient rehabilitation works, the port will not be able to participate in the international RO-RO shipping route.

In Tawau Port, the existing wharf is not sufficient to develop a RO-RO terminal. However there is no plan and budget to extend port infrastructure for this purpose.

The Serasa Terminal, Muara Port, cannot accommodate over middle-sized RO-RO vessels although the Zamboanga – Muara route must assign such a vessel due to the characteristics of long route distance and sea conditions. Thus new RO-RO terminals would be necessary at both sides provided that the route idea could be put into practice.

Through a series of consultation meetings with international RO-RO shipping related regulatory agencies among the five (5) route connecting countries, it appears that Brunei Darussalam, Malaysia and Thailand may temporarily admit foreign road transport vehicles without security deposit and the like. On the contrary, it is understood that Indonesia imposes security deposit on foreign transit vehicles from seaways. The Philippines have no temporary admission scheme and thus impose import duty against all foreign vehicles. Since the all eight (8) surveyed routes are connected with Indonesia and/or Philippines, they all hold those institutional issues accordingly.

Lastly, the routes without existing traffic (ranked C in traffic) or non-accessible ports by RO-RO vessels (ranked D in infrastructure) may be disregarded in the rating for priority routes, including the routes of Belawan – Phuket, Johor – Sintete and Labuan – Brooke's Point.

Based on the afore-mentioned evaluation and screening works, the remaining five (5) candidate routes are duly ranked for prioritization in Table 13.1.

Table 13.1 Priority Evaluation by Route

Rating	Route	Connecting Countries	Divertible Existing Traffic	Available Infrastructure	Institutional Arrangement	Proposed Ship
1	Dumai – Malacca	Indonesia, Malaysia	A	B (Dumai) **C (Malacca)**	**B (Indonesia)** A (Malaysia)	Small ROPAX
2	Belawan – Penang	Indonesia, Malaysia	A	B (Belawan) **C (Penang)**	**B (Indonesia)** A (Malaysia)	Middle to Large ROPAX
3	Davao/General Santos – Bitung	Philippines, Indonesia	B	B (Gensan) B (Bitung) **C (Davao)**	**B (Indonesia)** **B (Philippines)**	Middle RO-RO
4	Tawau – Tarakan - Pantoloan	Malaysia, Indonesia	B	**C (Tawau)** B (Tarakan) B (Pantoloan)	**B (Indonesia)** A (Malaysia)	Small ROPAX
5	Muara – Zamboanga	Brunei Darussalam, Philippines	B	**C (Muara)** **C (Zamboanga)**	A (Brunei Darussalam) **B (Philippines)**	Middle ROPAX
-	Muara – Labuan – Brooke's Point	Brunei Darussalam, Malaysia, Philippines	B	A (Muara) A (Labuan) **D (Brooke's Point)**	A (Brunei Darussalam) A (Malaysia) **B (Philippines)**	
-	Belawan – Phuket	Indonesia, Thailand	C	**B (Belawan)** **B (Phuket)**	**B (Indonesia)** A (Thailand)	
-	Johor – Sintete	Malaysia, Indonesia	C	A (Tj.Belungkor) **D (Sintete)**	**B (Indonesia)** A (Malaysia)	

Note 1: Divertible Existing Traffic
A - observed existing traffic on the entire stretch
B - observed existing traffic on part of the route
C - observed no existing traffic

Note 2: Available Infrastructure
A - international RO-RO terminal available
B - RO-RO terminal available without CIQS
C - no RO-RO terminal available
D - incapable acceptance of RO-RO vessel

Note 3: Institutional Arrangement
A – possible acceptance of foreign transit vehicles without tax and guarantee deposit
B - difficult acceptance of foreign transit vehicles without tax and guarantee deposit

Note 4: More critical evaluation results are written in bold.

Source: JICA Study Team

13.3 Selected Priority Routes

The JICA Study Team has selected three priority routes after analyzing the route profiles and advantages and anticipated risks of each route. The 24th MTWG as well as the 34th STOM approved the selection of the following priority routes:

(1) The Dumai – Malacca Route

Route profile and advantages

i. Various demand segments (passenger, vehicle and cargo) can be anticipated.
ii. Technical ease to assign small ROPAX vessels on the calm and short route.
iii. High local aspiration at both Riau and Malacca as well as high central government priority

Anticipated risks

i. An appropriate international RO-RO terminal will not be prepared in Malacca.
ii. The Indonesian customs will not accept foreign transit vehicles without security deposit.
iii. Anticipated demand will not be realized due to competition with passenger shipping service, etc.

(2) The Belawan – Penang – Phuket Triangle Route

Route profile and advantages

i The Belawan – Penang route has a large potential despite its currently small direct shipping movement.
ii Due to the route condition, middle to large ROPAX vessel is desirable on the Belawan – Penang route.
iii One destination of increased land cross-border traffic between Malaysia and Thailand is Phuket as a regional tourism hub. Diverted traffic to RO-RO shipping is expected.
iv Taking the proposed ship size (middle to large ROPAX) and year-round operation into account, a triangle route with high ship utilization will be more sustainable than a shuttle route.

Anticipated risks

i. An appropriate international RO-RO terminal will not be prepared in Penang.
ii. The Indonesian customs will not accept foreign transit vehicles without security deposit.
iii. An appropriate middle-to-large ROPAX will not be procured or newly constructed due to financial and/or technical reason(s).
iv. Anticipated demand will not be realized due to competition with container shipping and air service, etc.

(3) The Davao/General Santos – Bitung Route

Route profile and advantages

i. Although no liner operation is observed on the route, some attempts were made in the past. The local economies at both sides are keen on introducing modern shipping in line with trade expansion.
ii. Some diverted traffic is anticipated from the historical NCV trade at the Sangihe Islands on the midway.
iii. Judging from route distance and oceanography, middle RO-RO vessel is suitable. Because of very thin air traffic demand and no passenger shipping service on the route, the ship may be dedicated to freight service.

iv. The Port of Davao (Sasa Wharf) is extremely congested and deteriorated. Since it poses danger to the movement of vehicles and passengers, it is advisable to use the Port of General Santos (Makar Wharf) as a RO-RO shipping gateway for South Mindanao for the time being.

Anticipated risks

i. The Indonesian customs and/or the Philippine customs will not accept foreign transit vehicles without security deposit and/or import duty.
ii. Competent RO-RO operator(s) will not appear to serve the route.
iii. An appropriate middle RO-RO vessel will not be procured or newly constructed due to financial and/or technical reason(s).
iv. Anticipated demand will not be realized.

Dumai – Malacca *Belawan – Penang – Phuket* *Davao/General Santos – Bitung*

Figure 13.1 Priority Routes

14 THE DUMAI – MALACCA ROUTE

14.1 Stakeholders' Views

The Riau Provincial Government and the Malacca State Government have been pursuing bilateral initiatives to open the new RO-RO shipping service in the past several years. This project is one of the priority projects under the MOU between the two local governments in 2009. The Riau Provincial Government funded the new RO-RO jetty facility which was opened near the Port of Dumai in 2009.

As the results of the stakeholders' interviews (23 in total), the stakeholders at both sides of the route welcome the planned RO-RO service and are willing to support it. They anticipate that the new service will contribute to their local economies through increased trade, business and tourism. They expect the RO-RO service to attract cargo and passenger users if it can provide safe, efficient, reliable and cost-effective services.

Table 14.1 Summary of Stakeholder Views on the Dumai-Malacca RO-RO Shipping Service

Aspect	Converging Views	Diverging and/or Singular Views
Overall Economic Benefits	• The RO-RO service can benefit businesses and the local economies by increasing trade, business, investment and tourism across the route.	• The State of Malacca prioritizes tourism development in association with RO-RO shipping rather than freight trade.
Market	• Cargo stakeholders and tour operators are generally willing to use the RO-RO service. • Certain cargoes currently being transported by wooden-hulled boats, general cargo, and conventional container vessels may possibly be carried on the RO-RO service. • Port Klang is seen as a competitor port to the Dumai-Malacca shipping connection.	• Some tourism stakeholders think that RO-RO passenger service may not be attractive to tourists who might prefer to travel by air. Others believe that the RO-RO can complement existing air and ship passenger services and can attract certain travel market segments such as traders, overseas workers, and medical tourists (especially those requiring travel lying down). • Malacca residents may utilize the new route to go shopping on weekends with their own cars, both for personal consumption and for commerce.
Infrastructure	• Malacca still has to identify which port will be designated for the RO-RO service.	• Riau stakeholders consider the building of the Pekanbaru-Dumai toll road as a critical infrastructure to support the RO-RO route.
Legal and Institutional Issues	• CIQS issues that may hinder the effective operation of the RO-RO service and may affect the movement of the cargo and passengers using the RO-RO, need to be addressed. • Bilateral agreements on trade, tourism, CIQS, etc. may support and help promote the sustainability of the RO-RO service.	• Riau stakeholders think their Malacca counterparts are moving very slow on bilateral commitments to open the RO-RO shipping connection.
Costs	• RO-RO shipping freight costs should be competitive with existing shipping costs. • RO-RO passenger fare should be cheaper than that of low cost carriers and speed boats (over USD50 per roundtrip).	
Ship Facilities	• RO-RO shipping service should provide safe, secure, efficient and cost-effective services in order to attract cargo and passengers. • RO-RO shipping service should have an adequate cargo and passenger capacity and operate on a suitable frequency.	• Some Malacca tourism stakeholders suggest for the RO-RO vessel to have special cabins with beds for medical tourists.

Source: Pekanbaru/Dumai and Malacca Field Surveys, JICA Study Team, 2012

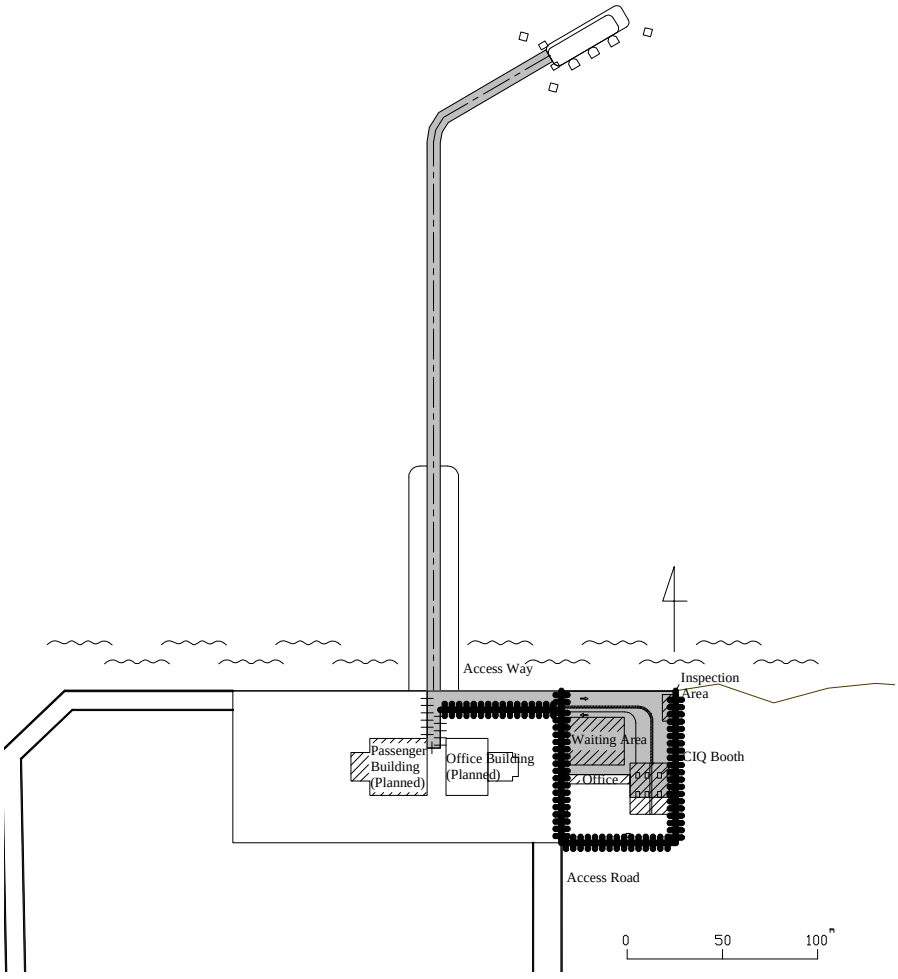
14.2 Infrastructure Preparation

(1) Dumai Port

An international RO-RO terminal is planned at Pangkalan Sesai, Dumai City where the domestic RO-RO terminal was constructed to provide RO-RO service connection with Rupat Island. The area is becoming a popular shipping terminal area since DGST constructed another jetty for domestic and international passenger ferries to be relocated from the existing passenger terminal within the Port of Dumai. It is located next to the RO-RO terminal site.

To accommodate an international RO-RO vessel, at least passenger terminal and vehicle terminal will have to be constructed in addition to the existing facilities. The total cost is estimated at US$ 1.3 million.

Within the terminal, the inbound/outbound flows of passengers and vehicles are designed separately. The terminal area is designated as restricted area and enclosed by fence in compliance with the ISPS Code.



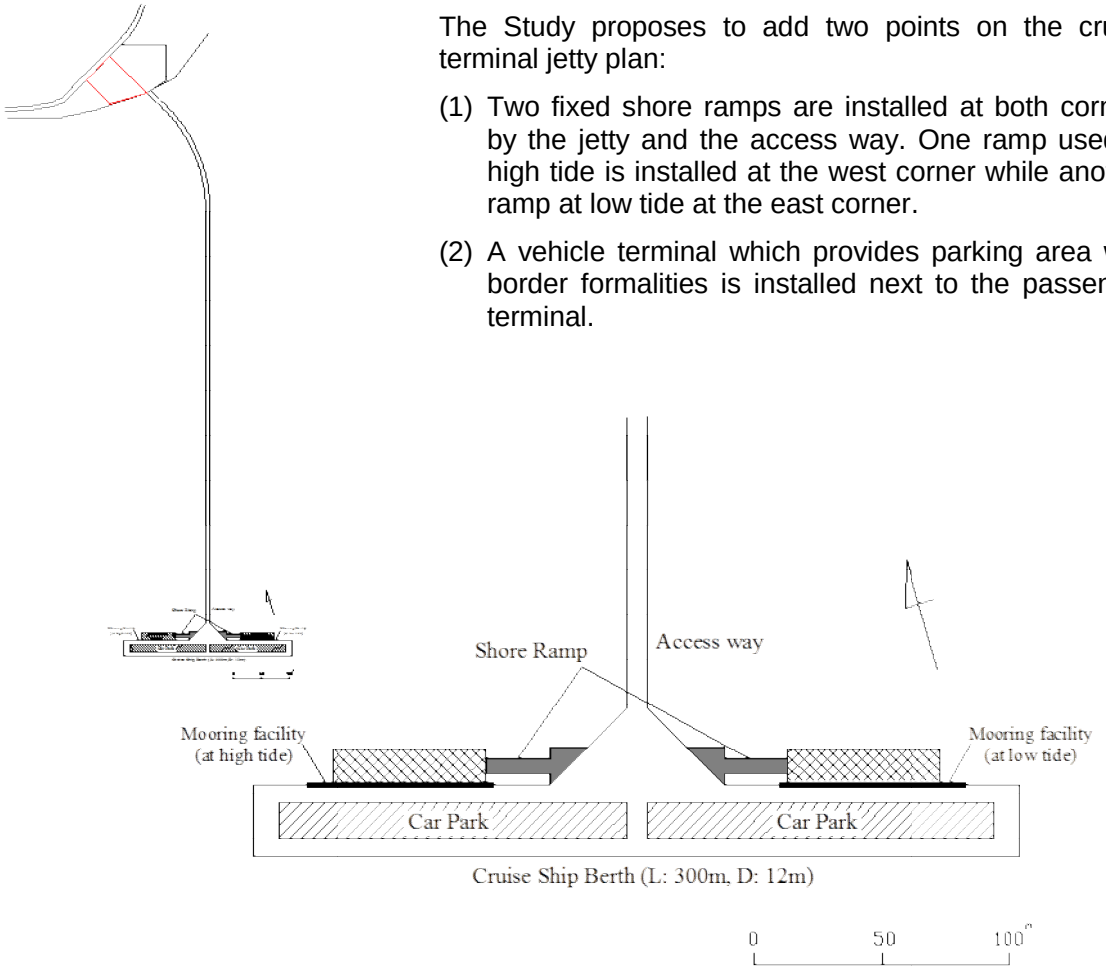
Source: JICA Study Team

Figure 14.1 Proposed Terminal Layout at Dumai

The Dumai – Pekanbaru road is a part of the Trans-Sumatra road which is designated as ASEAN Highway No.25 as well as Transit Transport Route (TTR). The Government of Indonesia's 'Master Plan for Acceleration and Expansion of Indonesia's Economic Development' (MP3EI) includes the Trans-Sumatra road. Now the toll road project (135 km) is ongoing in parallel with the existing road (199 km). The toll road will be open in 2015, drastically reducing the current travel time (5-6 hours) to only one third.

(2) Malacca Port

International RO-RO terminal at Malacca has been examined at the proposed site of the international cruise terminal development project after the consultation meeting with the Malacca State and the Malaysian MOT in October 2012. The proposed jetty is located approximately 1000 m offshore of the man- made island and the depth of the sea there is approximately 12 m. The jetty is connected with the island with a 630 m long causeway and a 400 m long bridge.



The Study proposes to add two points on the cruise terminal jetty plan:

(1) Two fixed shore ramps are installed at both corners by the jetty and the access way. One ramp used at high tide is installed at the west corner while another ramp at low tide at the east corner.

(2) A vehicle terminal which provides parking area with border formalities is installed next to the passenger terminal.

Source: JICA Study Team

Figure 14.2 Proposed International RO-RO Terminal at Melaka Cruise Terminal

The cost inclusive of the above additions is estimated at US$ 2.3 million.

The Malaysian North-South Expressway is designated as ASEAN Highway No.2 as well as TTR. Although the connecting road to the city center is not included in the ASEAN Highway network, when opening a new RO-RO route at Malacca, it is necessary to accept transit vehicles from a RO-RO ship not only on the connecting road but also other city roads to tourism sites.

14.3 Shipping Strategy and Ship Operation Plan

(1) Potential Traffic Demand

To attract cargo demand to the new RO-RO service, it is essential to convert part of the existing break-bulk cargo trade, mostly done by NCV, and realize potential cargo demand among local stakeholders. Particularly the cargoes which are suited for RO-RO shipping, include perishable and valuable goods, goods to be transported fast and seamless between the shipper and the consignee, and personal wholesale purchase transported within the vehicle. Based on the results of port traffic survey and stakeholders' interviews, those traffic volumes are obtained. The traffic data is further analyzed in order to estimate potential RO-RO cargo demand:

Table 14.2 Potential RO-RO Cargo Demand

Yearly Demand	Between Dumai and Malacca
Convertible Cargo Demand *	102,755 tons
Inducible Cargo Demand **	80,000 tons
Total	182,755 tons

*) Anticipated yearly NCV trade between Dumai and Malacca in 2015
**) Potential yearly cargo volume in 2015 among interviewed stakeholders
Source: JICA Study Team

Both the local economies highly expect tourism development by way of the new RO-RO shipping service. It is noted that Malacca tourism has recently boosted its market. The number of Indonesian visitors has jumped up from 106 thousand in 2008 to 504 thousand in 2012 (estimated) including unique medical tourism (90 thousand in 2012 - estimated). It is expected that the new RO-RO shipping will create a new tourism market focusing on different demand segments of current passenger ferry and air services such as group tour by bus, medical tourism by vehicle and other personal movement by vehicle.

(2) RO-RO Shipping Traffic Plan

In order to introduce new RO-RO shipping service as an alternative service to the existing corridor-wide transport services, the Study shows projected traffic volume as below.

Table 14.3 RO-RO Shipping Traffic between Dumai and Malacca (Weekly, 2015-2035)

Weekly Two Way Traffic Volume		2015	2020	2025	2030	2035
Passenger	Total person	2,000	2,280	2,560	2,860	3,180
	(non vehicle)	(190)	(220)	(230)	(280)	(310)
Vehicle	Car	189	215	242	271	301
	Bus	44	50	57	63	70
	Truck	78	86	94	102	112
Cargo Total (ton)		430	470	510	560	610
Featured haulage	(A) => (B)	- Medical tour with family, Genting Highland tour, Malacca & Singapore sightseeing tour - Vegetables, Fish, Paper products, Palm shell, Cooking oil				
	(B) => (A)	- Shopping tour of daily commodity, Golf tour - Sugar, Biscuit, Processed food product, Construction Materials				

Source: JICA Study Team

The forecast result includes passenger vehicles (cars and buses) and trucks. Assuming that one bus and one truck are equivalent to 3 cars in terms of floor occupancy each, trucks and buses account for around 40% of the vehicle space in the ship. It is the lowest truck

share among the three (3) priority routes. It is reflected on the stakeholders' views at both Malacca and Riau, promoting tourism development by RO-RO shipping.

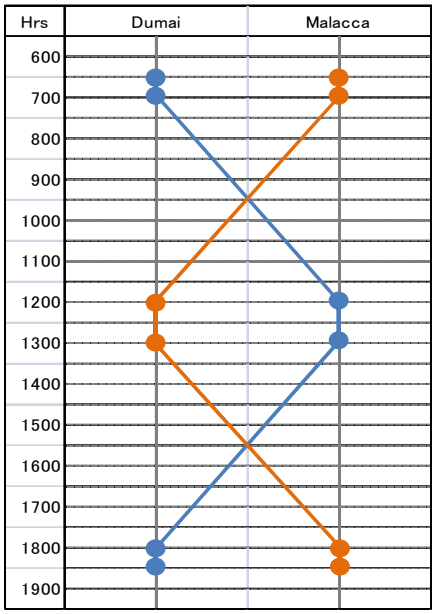
The projected cargo volume in 2015 is equivalent to 12.2% of the combined convertible and inducible traffic volume in 2015 (refer to Table 14.2). It envisages that the new RO-RO service will take RO-RO shipping suited cargo for commercially viable and sustainable operation.

The projected passenger volume in 2015 is 104 thousand annually. Most of the passengers will travel with vehicles on board. It is considered a new service and it is different from the existing services. It is estimated that Indonesian passengers would account for 70% of the total market, or about 36,400 Indonesians will visit Malacca in 2015. The Malacca tourism market may have enough absorptive capacity.

(3) Ship Operation Plan

The Malacca State Government has appointed a RO-RO shipping operator on the route. Although no appointment/approval has been made in Indonesia, some public and private RO-RO operators showed interest in the route to the Study Team during the field survey.

Since the Dumai – Malacca route is short and mostly calm, two (2) small RO-RO vessels are planned to serve on the route with high frequency. The Malacca Strait around the route has a large shipping traffic volume. Large vessels navigating along the Strait sometimes face difficulty in watching small vessels during nighttime navigation. Therefore the proposed small RO-RO vessels will ply to and from Dumai and Malacca only during daytime, two round trips per day.



Source: JICA Study Team

Figure 14.3 Ship Operation Plan on the Dumai and Malacca Route

14.4 Preliminary Ship Design

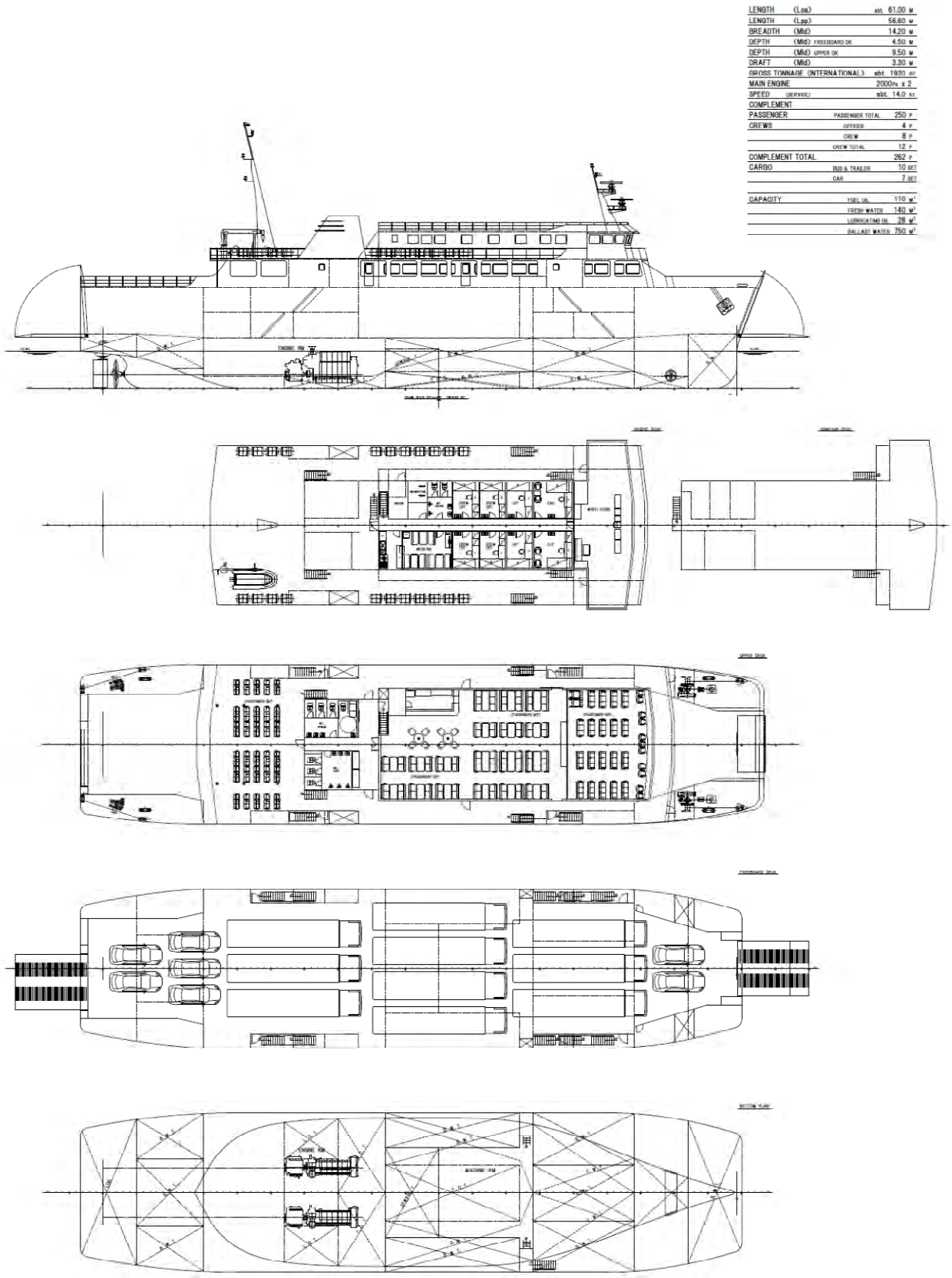
In addition to the requirement regarding cargo and passenger loading capacity indicated in the demand forecast as shown in the previous paragraph, important facts and conditions are considered in a comprehensive manner in the preliminary ship design for Dumai-Malacca route, including (i) port to port distance, (ii) sea conditions, (iii) ship operation plan, and (iv) docking conditions.

The new construction cost of 25 million US$ is estimated based on the recently published information paper by the Ministry of Land, Infrastructure and Transport of Japan.

Table 14.4 Principal Particulars

Length over all	Approx. 61.0	M
Length between perpendiculars	56.6	M
Breadth	14.2	M
Depth	9.5	M
Draft (design)	3.3	M
Gross tonnage (international)	1920	T
Maine engine	2942	kw
Service speed	Approx. 14.0	Kt
Loading capacity		
Truck	10	Unit
Passenger car	7	Unit
Passenger	250	Person
New shipbuilding cost	12.5	Mil $

Source: JICA Study Team



Source: JICA Study Team

Figure 14.4 General Arrangement Plan for the RO-RO Vessel on Dumai - Malacca

14.5 Institutional Arrangement

(1) Dumai

Port Policy: The Provincial Government of Riau constructed the existing RO-RO terminal at Dumai in 2009. The terminal which is now used for only domestic RO-RO service will have its function expanded for international use also.

Customs Regulations: The main hindrance for the advancement of the international RO-RO shipping service in the Dumai side would be the treatment of vehicle in transit. Presently, a vehicle that would enter the port would be treated as an importation and, therefore, subject to import duties and taxes or bond guarantee if approved by customs as temporarily imported.

Notwithstanding the present situation, an alternative solution can still be found to surmount this problem by means of studying related BIMP-EAGA MOUs in the island of Borneo and their practices. They enable vehicles to cross the borders without paying import taxes and duties. The same principles and guidelines embodied in this agreement can be suggested to be adopted to the RO-RO shipping service to be operated on this route.

Immigration Regulations: The Immigration Office at the Port of Dumai has experienced to treat international shipping passengers by fast boats without any serious issue reported.

Quarantine Regulations: The RO-RO service would foster greater movement of people and goods, which would also include plant and animal products, quarantine services should be strengthened accordingly.

Port Security: Due to currently no international operation at the terminal, it must be ISPS Code compliant from the beginning.

Recognition of Driver's License and Vehicle Registration: The recognition of driver's license is not a contentious issue as long as it is in a language recognized by the country. For drivers between Indonesia and Malaysia it is even easier as both the languages are closely related. The fact that both countries involved in the route are right-hand-drive (RHD) countries makes it easy for drivers to drive in the other country.

(2) Malacca

Port Policy: The State of Malacca envisages that an international RO-RO terminal will be attached to the proposed cruise terminal jetty off the coast of Melaka Island. The study report accepts this idea. However, it is not explicit about the responsible entities of port construction, management and operation.

Customs Regulations: Previous experiences in the Penang – Belawan route have shown that the Malaysian side has a more relaxed application of Customs procedures with regard to vehicles in transit coming from Indonesia. It is also expected that the same treatment will be accorded to vehicles coming to this port. Considering that the envisaged port to serve Malacca is still to be developed, the provision for a consolidated CIQS building would be highly desirable to afford better service to clients and more efficient operations at the port.

Immigration Regulations, Quarantine Regulations, Port Security, Recognition of Driver's License and Vehicle Registration: Necessary arrangement matters are the same as the Dumai RO-RO Terminal has.

15 THE BELAWAN – PENANG – PHUKET ROUTE

15.1 Stakeholders' Views

Despite the failed attempts at RO-RO shipping connections between Belawan and Penang in 2005, it still represents the IMT-GT cooperation blueprint. Since the local governments have observed many changes in recent years such as more business, trade, passenger movement across the strait, Penang State and North Sumatra Province intend to introduce a RO-RO shipping route again.

As the results of the stakeholders' interviews (85 interviewees in total) show, they are mostly optimistic about new RO-RO shipping service because of bigger local markets today and more expectation of trade and tourism expansion. However they point to the need to learn from the lessons of the past and to address the market, costs, technical and institutional requirements (refer to Column 1).

Table 15.1 Summary of Stakeholder Views on the Belawan-Penang-Phuket RO-RO Shipping Service

Aspect	Converging Views	Diverging and/or Singular Views
Overall Economic Benefits	• The RO-RO route is in line with the IMT-GT cooperation blueprint. The RO-RO service can benefit businesses and increase trade and tourism across the route.	
Market	• Despite past failed attempts of RO-RO shipping between Indonesia and Malaysia, changes in the business environment attested by bigger local economies, increased cargo and passenger traffic and improved port facilities, are now more favorable to introducing RO-RO shipping again. • There is significant volume of cargo trading across the Belawan-Penang route, which is currently shipped by wooden-hulled boats, small vessels, and container vessels. These and other potential cargoes such as electronic appliances and various consumer products currently via Jakarta may possibly use the new RO-RO service. • Belawan and Penang cargo stakeholders do not see much trade potentials with Phuket. This route may be better for passenger traffic. • The RO-RO service can potentially cater to the needs of medical tourists as well as niche markets including traders, businessmen, overseas workers, students, visiting relatives, and backpackers. • Port Klang is seen as a competitor port to the Belawan-Penang shipping connection.	• Some Penang tourism stakeholders think that RO-RO service may not be suitable for most medical tourists, who would rather prefer the more convenient airline transport. • Aside from medical tourism, tourism organizations in Penang are also promoting heritage tours in this world heritage city. • The new shipping service can potentially increase tourism traffic especially between Penang and Phuket, which are both major tourism destinations.
Infrastructure	• Dedicated RO-RO facilities should be put in place in Belawan, Penang and Phuket ports.	
Legal and Institutional Issues	• CIQS regulations should be more simplified, standardized, liberalized and should not result in delays in cargo movement and high operating costs for the shipping operator and users. • Common port tariffs at the Belawan and Penang Ports should be adopted for the RO-RO service. • Certain trade regulations in Penang that contribute to high trading operation costs should be looked into, including port tariff, import duty on fish and fumigation requirements on agricultural products. • Trade and business exchanges between Indonesia, Malaysia and Thailand should be strengthened to promote cross-border trade. • RO-RO shipping service should have adequate publicity, marketing and promotions support.	

Aspect	Converging Views	Diverging and/or Singular Views
Costs	• RO-RO shipping freight costs should be competitive with existing trucking and shipping costs. • RO-RO passenger fare should be cheaper than that of low cost carriers and ferry boats (ranging from USD50 to 75 per roundtrip).	• Penang cargo stakeholders prefer if port charges for the Belawan-Penang RO-RO service would at least be comparable to those of Port Klang. • Penang stakeholders think that the RO-RO operations may need to be subsidized initially until it becomes sustainable.
Ship Facilities	• RO-RO shipping service should have an adequate cargo capacity to accommodate current and projected cargo volumes. • It must observe a regular and reliable shipping schedule. • It should have safe, comfortable and convenient facilities for passengers.	

Source: Medan/Belawan, Penang and Phuket Field Surveys, JICA Study Team, 2012

Column 1 **Pilot RO-RO Shipping Project between Belawan and Penang**	
Pilot Operation	PT. ASDP, an Indonesian state-owned ferry operator, ran operational test of the Belawan-Penang route with a RO-RO vessel named KMP Jatra III on 15-22 June 2005. The first trip carried nothing from Belawan Port, and the second trip carried only one car from Malaysia.
Vessel Information	Jatra III (GT 3,123) was a second hand vessel bought from Japan which was built in 1985. 
Identified Problems	(1) Regulation problem: In relation with the customs regulation in Indonesia, transit vehicles are regarded as imported goods or temporary imported goods. In the pilot project, a Malaysian driver bought a guarantee bond from an Indonesian insurer which was equivalent to the import duty of his vehicle, usually 40-50% of its vehicle price. (2) Technical problem: In Penang, there was no dedicated RO-RO terminal available. RO-RO vessels must use for vehicle at Butterworth wharf while for passengers at Swettenham Pier Cruise Terminal. (3) Subsidy problem: The Government of North Sumatra agreed to support the pilot operation by giving PT. ASDP fuel subsidy. But, in fact, there was misunderstanding between PT. ASDP and the government regarding the definition of fuel subsidy (use of already subsidized fuel for domestic use or use of non-subsidized fuel for international use). In fact, PT. ASDP must use non-subsidized fuel for international use and thus the subsidy amount from the provincial government was not sufficient for PT.ASDP as expected. Due to combined impacts of those problems, an anticipated RO-RO shipping market was not realized in the pilot project.

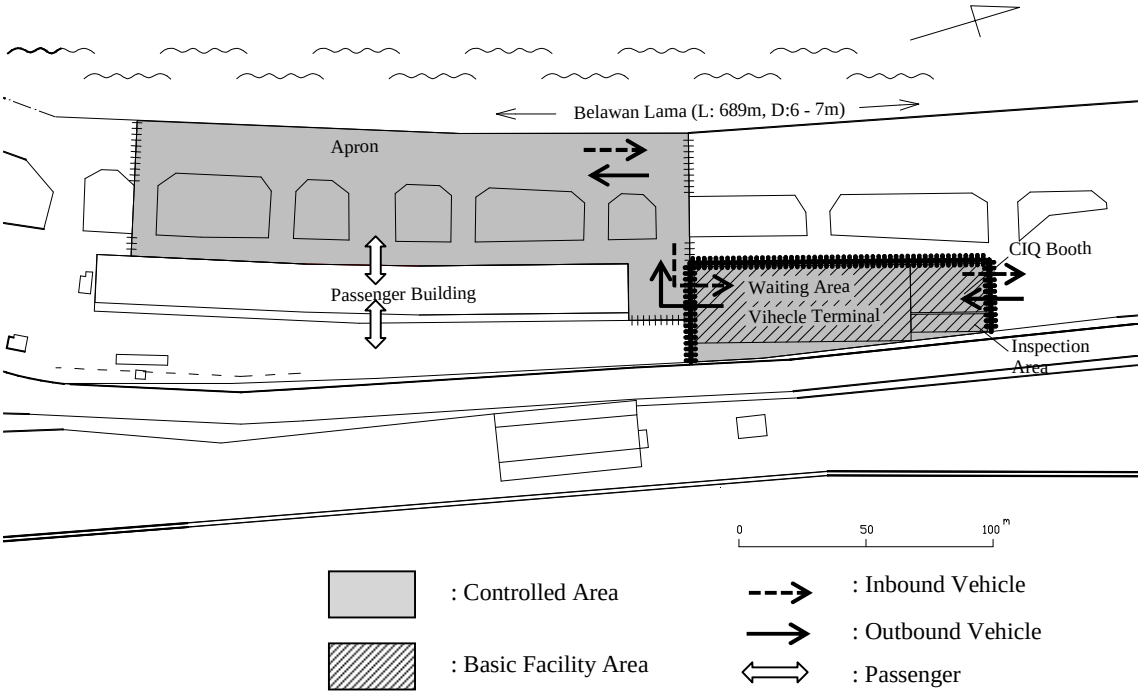
Source: JICA Study Team, interviewed with PT. ASDP and Customs Office in Belawan Port

15.2 Infrastructure Preparation

(1) Belawan

Belawan Lama has a wharf length of 689 m with a water depth of 6-7 m. The apron is 15 m wide and it is narrow for a 40-foot container trailer to roll on and roll off a vessel.

To make Belawan Lama an international RO-RO terminal, passenger CIQ functions should be installed at the proposed passenger terminal. A vehicle terminal will be allocated. The ISPS Code compliance is an obligatory requirement. A moderate cost of US$ 80,000 is estimated for such additions.



Source: JICA Study Team

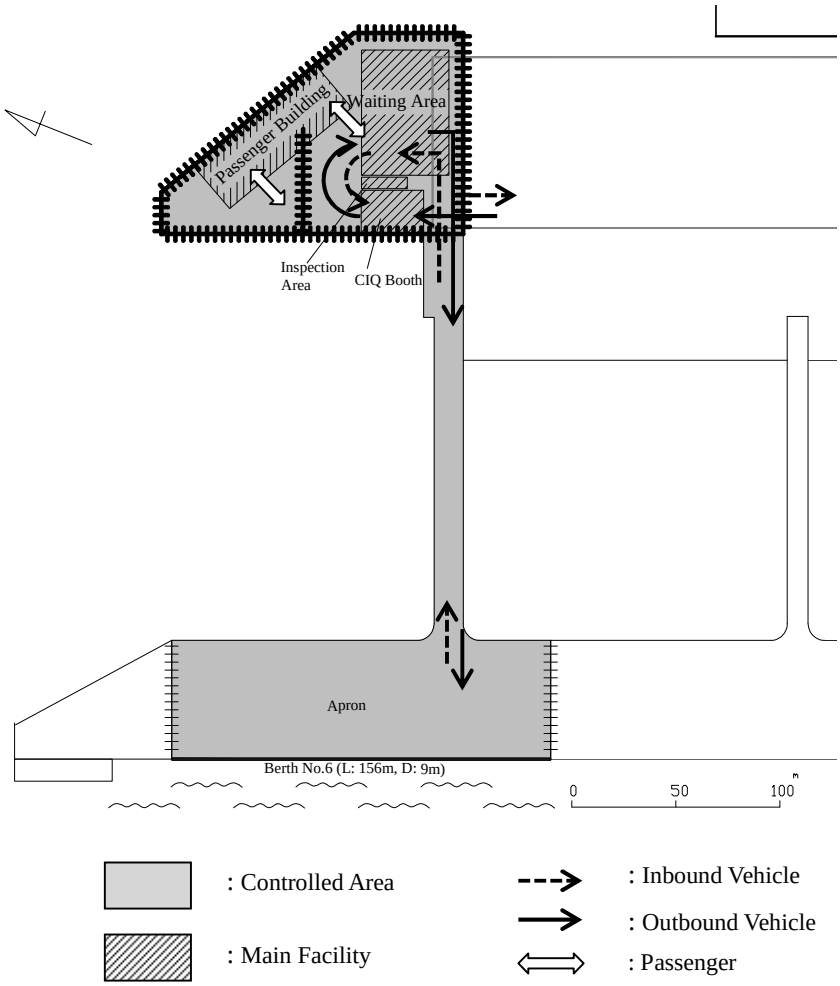
Figure 15.1 Proposed Terminal Layout and Traffic Flow at Belawan Lama

Belawan Lama is located nearby at the entrance of the toll road as well as the rail station, both connecting to Medan. The Indonesian Government prioritizes the trans-Sumatra road or ASEAN Highway No. 25, passing through Medan. Medan has further radial toll road projects in the pipeline which will provide better hinterland connection with the Port of Belawan.

(2) Penang

According to the Penang Port Commission, the Butterworth Wharf is under reorganization due to the development of the North Butterworth Container Terminal. The Study makes an international RO-RO terminal plan at No. 6 Berth of Butterworth Wharf (156 m long, 9 m deep and 58 m wide. It was used for RO-RO terminal for a certain period after construction and now it is a multi-purpose berth.

The mooring conditions are good enough to accommodate a middle-sized RO-RO vessel. However passenger terminal and vehicle terminal must be newly constructed. There is a bridge of 155 m between the proposed terminal site and No.6 Berth. Therefore, passengers must be transported by bus. The terminal cost is estimated at US$ 630,000.



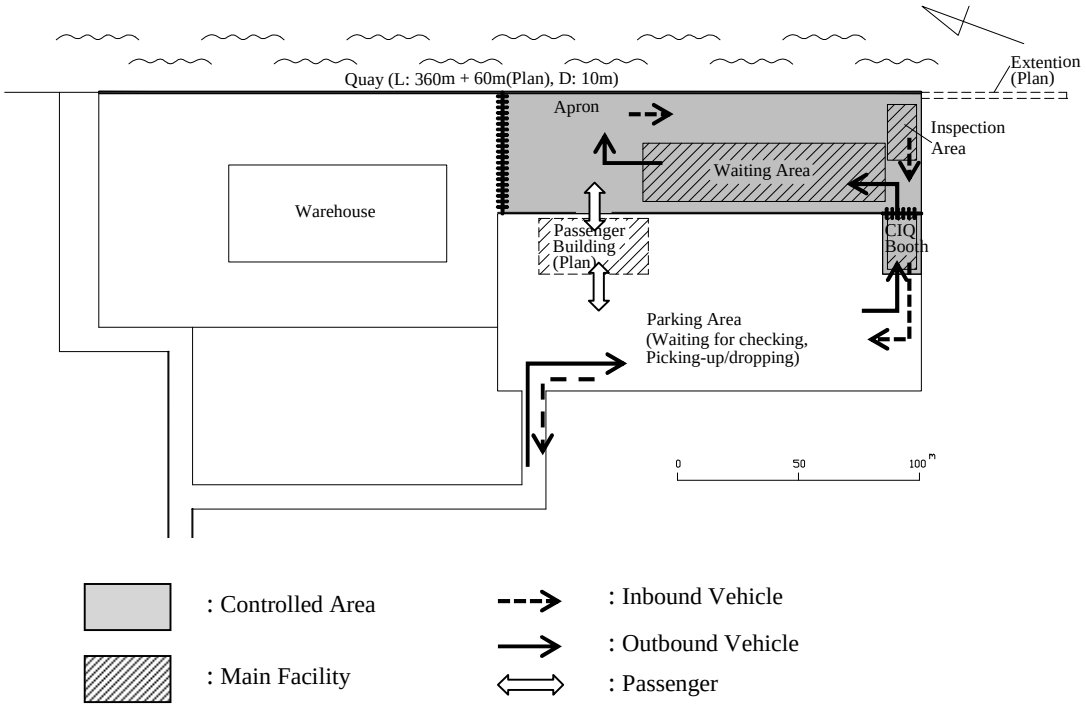
Note: Passengers move to/from the apron by bus.
Source: JICA Study Team

Figure 15.2 Proposed Terminal Layout and Traffic Flow at Penang Port

The Butterworth Area of the Penang Port has good transport connections with railway, bridge and ferry to Penang Island and expressway. The Malaysian North-South Expressway is designated as ASEAN Highway No.2.

(3) Phuket

The mooring facility of the port is 360 m long and its water depth is 10 m. The wharf apron is 30 m wide. Therefore the port has no problem to receive a middle-sized RO-RO vessel. Although the port receives many international cruise ships, it does not have a passenger terminal. According to the port plan, a passenger shed of 915 m^2 will be constructed. To operate the port as an international RO-RO terminal, a vehicle terminal will have to be allocated. The estimated cost is only US$ 22,000 if the existing apron space is utilized.



Source: JICA Study Team

Figure 15.3 Proposed Terminal Layout and Traffic Flow at Phuket Port

The ASEAN Highway Network Project does not cover Phuket Island. The access must be done via National Road No.4 from ASEAN Highway No.2. National Road No.402 serves Phuket Port. However, the existing road width (mostly 12 m wide) is not sufficient. To meet further traffic volume increase, the route should be widened in the near future.

15.3 Shipping Strategy and Ship Operation Plan

(1) Potential Traffic Demand

On the Belawan – Penang route, historical NCV trade continues, transporting vegetables, fruits, fresh fish and other general cargo such as bagged fertilizer. Container shuttle shipping service resumed in May 2012. As a result, the Study observes a large amount of break-bulk cargo trade and part of it may be convertible to RO-RO shipping.

On the Penang – Phuket route, there is no regular break-bulk and general cargo shipping service. The shipper/trader/forwarder must rely on road transport. In fact, the cross-border vehicle traffic from Thailand to Malaysia recorded a huge volume, i.e. 279 thousand trucks in 2011. The stakeholder survey got one shipper in Phuket which sent its plastic products by container trailer to Penang but the shipper prefers economic and regular shipping service like RO-RO shipping.

On the Phuket – Belawan route, there is no regular shipping service and no break-bulk cargo information among the stakeholders interviewed in the Study.

Based on the results of port traffic survey and stakeholders' interviews, the current traffic volumes were obtained. The traffic data is further analyzed in order to estimate potential RO-RO cargo demand on the Belawan – Penang route section and the Penang – Phuket route section.

Table 15.2 Potential RO-RO Cargo Demand between Belawan and Penang

Yearly Demand	Between Belawan and Penang
Convertible Break-bulk Cargo Demand *	83,196 tons
Convertible Container Cargo Demand **	25,488 TEU
Inducible Container Cargo Demand ***	37,397 TEU
Inducible Break-bulk Cargo Demand ***	42,484 tons
Total (/ year) ****	754,530 tons

*) Estimated yearly NCV trade between Belawan and the Malay Peninsula in 2015
**) Estimated yearly container shuttle service between Belawan and Penang in 2015
***) Estimated inducible demand in 2015 based on the calculation result of the gravity model developed by JICA Study Team
****) Average cargo per container – 10 tons

Source: JICA Study Team

Table 15.3 Potential RO-RO Cargo Demand between Penang and Phuket

Yearly Demand	From Penang to Phuket	From Phuket to Penang
Convertible Cargo Demand *	7,852	(unspecified)
Inducible Cargo Demand **	(unspecified)	840 TEU
Total (/year) ***	7852 tons	8,400 tons

*) Estimated general cargo ship trade in 2015
**) Estimated inducible demand in 2015 among interviewed stakeholders
***) Average cargo per container – 10 tons

Source: JICA Study Team

As to passenger service, fast passenger shipping service was suspended in 2010 due to mainly severe competition with emerging LCCs on the Belawan – Penang route. LCCs are still prevailing, therefore RO-RO shipping will focus on different clientele segments such as bus tours using RO-RO vessel as nighttime transportation as well as accommodation and passengers with vehicles.

On the Penang-Phuket route, RO-RO shipping will promote modal shift from road driving to sea sailing together with their buses and cars.

On the Belawan – Phuket route, no explicit demand has been found. Air Asia attempted the Medan – Phuket route but it was suspended after 3 months. The corridor passenger traffic seems still small.

(2) RO-RO Shipping Traffic Plan

The forecast is estimated from the present potential of demands shown in the above table by the growth ratio and some assumptions. New RO-RO shipping will be able to provide competitive service with NCVs, container shipping and cross-border road transport in selective market segments. This route will also form a unique tourism triangle among North Sumatra, Malaysia and Thailand while local tourism agents/tour operators are expected to develop RO-RO shipping suited tour packages.

Table 15.4 RO-RO Shipping Traffic on Belawan, Penang and Phuket (Weekly, 2015-2035)

Weekly Two Way Traffic			2015	2020	2025	2030	2035
(A) Belawan (B) Penang	Passenger	Total person	990	1,120	1,260	1,410	1,560
		(non vehicle)	(80)	(90)	(110)	(130)	(150)
	Vehicle	Car	89	102	115	128	142
		Bus	21	24	27	30	33
		Truck	84	86	88	88	90
	Cargo Total (ton)		350	390	420	460	500
	Featured haulage	(A) => (B)	- Medical tour with family, bus tour with amusement ship - Vegetable, Fruits, Fish				
		(B) => (A)	- Toba lake and Aceh tour, Shopping tour in Medan - Home electric appliances, Manufacturing spare parts, Accessories				
(B) Penang (C) Phuket	Passenger	Total person	490	560	620	670	720
		(non vehicle)	(50)	(40)	(50)	(60)	(70)
	Vehicle	Car	44	50	55	60	65
		Bus	10	12	13	14	15
		Truck	42	44	46	46	48
	Cargo Total (ton)		200	210	230	250	260
	Featured haulage	(B) => (C)	- Thailand resort tour - Alternative cargo way for land transportation				
		(C) => (B)	- Malaysia & Singapore bus tour - Cargo stock & loading to export to other countries				
(C) Phuket (A) Belawan	Passenger	Total person	50	60	500	540	590
		(non vehicle)	(10)	(10)	(60)	(60)	(60)
	Vehicle	Car	5	5	45	49	53
		Bus	1	1	10	11	12
		Truck	4	4	34	36	40
	Cargo Total (ton)		20	20	190	200	220
	Featured haulage	(C) => (A)	- The demands will increase after around 2025.				
		(A) => (C)	- The demands will increase after around 2025.				

Source: JICA Study Team

The forecast result includes passenger vehicles (cars and buses) and trucks. Assuming that one bus and one truck are equivalent to three (3) cars in terms of floor occupancy each, trucks and buses account for around 60% of the vehicle space in the ship.

There are some implications obtained from the comparison between the route traffic projection of year 2015 and the estimated convertible and inducible cargo demand in 2015.

- The year 2015 cargo demand on the Belawan – Penang route is equivalent to 5.4% of the estimated convertible cargo transported by NCVs and container vessels and 2.4% of the combined amount of the estimated convertible and inducible cargoes as shown in Table 15.2.
- The year 2015 cargo demand on the Penang – Phuket route is equivalent to 64% of the combined amount of the estimated convertible and inducible cargoes as shown in Table 15.3. It means that concerted marketing efforts are required to find sufficient cargo or to allocate more space inside the ship for cars and buses.

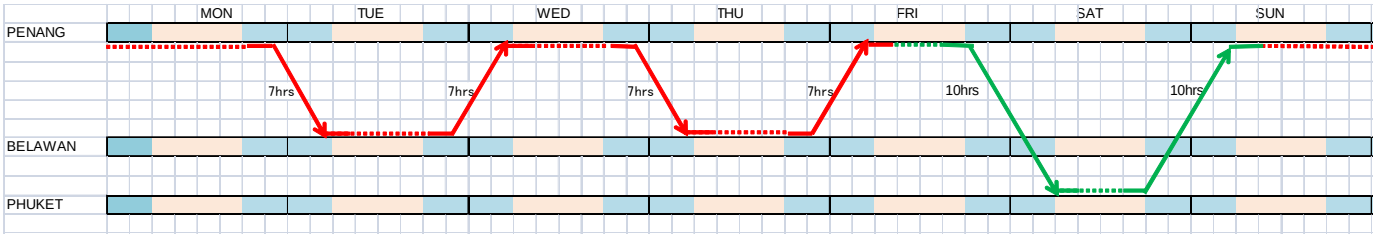
There is no convertible passenger traffic since no passenger shipping service is available on the triangle route except cruise ships and chartered ships. It means that the new RO-RO shipping will create a new market to connect with international tourism destinations such as Phuket and Penang.

(3) Ship Operation Plan

In Indonesia, some public and private operators have shown their interests in the route to the Study Team during the field survey. In Malaysia and Thailand, potential operators are unknown to the team. One reason is attributable to different shipping industry characteristics of Malaysia and Thailand where there is no RO-RO operator to assign such several thousand tons' vessels. It does not deny a possibility of RO-RO shipping operator on the route from Malaysia and Thailand. As results, so far no RO-RO operator has been appointed by related central and local governments.

One middle-sized RO-RO vessel will be assigned on the Belawan – Penang – Phuket route. The vessel will ply twice a week between Belawan and Penang on weekdays and once a week between Penang and Phuket to meet weekend tourism demand.

Estimated navigation time is 7 hours between Belawan and Phuket while 10 hours between Penang and Phuket. For easy bus tour arrangement, the vessel will transfer from port to port during nighttime in principle.



Source: JICA Study Team

Figure 15.4 Ship Operation Plan on the Belawan – Penang – Phuket Route

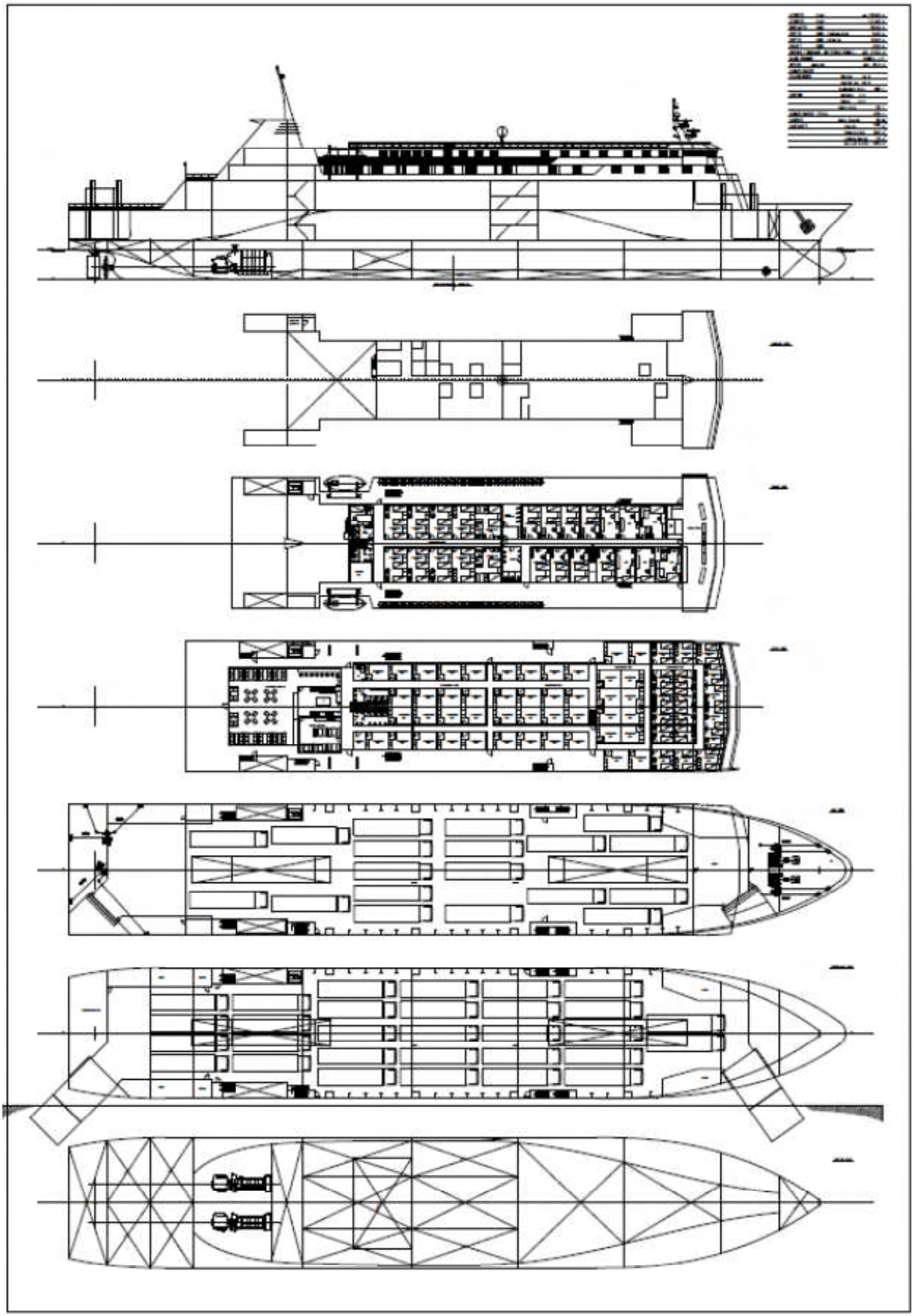
15.4 Preliminary Ship Design

In addition to the requirement regarding cargo and passenger loading capacity indicated in the demand forecast as shown in the previous paragraph, important facts and conditions are considered in a comprehensive manner in the preliminary ship design for Belawan – Penang - Phuket route, including (i) port to port distance, (ii) sea conditions, (iii) ship operation plan, and (iv) docking conditions. The new construction cost of US$ 35 million is estimated.

Table 15.5 Principal Particulars

Length over all	Approx. 120.0	m
Length between perpendiculars	111.0	m
Breadth	20.0	m
Depth	10.5	m
Draft (design)	4.5	m
Gross tonnage (international)	9150	T
Maine engine	5884	kw
Service speed	Approx. 20.0	Kt
Loading capacity		
- Truck	49	Unit
- Passenger	400	Person
New shipbuilding cost	35	Mil $

Source: JICA Study Team



Source: JICA Study Team

Figure 15.5 General Arrangement Plan for the RO-RO Vessel on Belawan-Penang-Phuket

15.5 Institutional Arrangement

(1) Belawan Port

Port Policy: The Port of Belawan is regarded as 'international port' operated by PELINDO-I. There is no policy conflict when the port will open an international RO-RO terminal to directly connect with Penang and Phuket. The existing passenger terminal of Ujung Baru will be totally removed to Belawan Lama by 2013. An international RO-RO terminal is supposed to use Belawan Lama but PELINDO-I has not prepared it yet.

Customs Regulations: The Customs procedures at Belawan Port would be the same as in any other Indonesian port, incoming vehicles would be treated as imported goods, and, therefore, are subject to import taxes and duties or bond guarantee, if approved by customs as temporarily imported. The proposed solution is the same as in the Port of Dumai.

In a coordination meeting with Customs officials in Belawan, it was suggested that a national policy on the special treatment of RO-RO vehicles should be issued from the Central Office in Jakarta (the Directorate General for Customs).

Immigration Regulations: The immigration office at the port has continuous experiences to undertake passport control on international shipping passengers even after the suspension of the fast passenger shipping service with Penang in 2010. However, considering that the RO-RO service would also mean more movement of people, the immigration officials should also be on the lookout against human trafficking and cross-border movement of unwanted elements.

Quarantine Regulations: The Port of Belawan is expected to handle a lot of agricultural and meat product to be exported to the Malaysian side. This highlights the need for quarantine procedures to safeguard against the spread of diseases, whether it be on persons, plants or animals.

Port Security: Belawan Lama, which is proposed to serve as the port for the RO-RO service, would need a lot of security improvements in its facilities. The proposed international passenger terminal is not fenced off from the rest of the port. The access to the international passenger terminal, the holding area for international RO-RO vehicles or container chassis and the port apron for international operations should be controlled.

Recognition of Driver's License and Vehicle Registration: For drivers between Indonesia and Malaysia it is even easier as both the languages are closely related, there is almost no need for translation. Drivers from Thailand would need to have a translation of their licenses. The fact that all three countries involved in the route are right-hand-drive (RHD) countries makes it easy for drivers to drive in the other country.

(2) Penang Port

Port Policy: The Port of Penang is the largest port on the proposed RO-RO shipping route. In line with the development of the North Butterworth Container Terminal, the Butterworth Terminal is now under reformation. Pier No.6 used to serve RO-RO vessels. The Penang Port Commission, Penang Port Sdn Bhd and JICA Study Team agreed to design an international RO-RO terminal at Pier No.6 for study purpose.

Customs Regulations: The Port of Penang has had a long history of trading, so its Customs procedures can be said to be matured and up-to-date already. However, RO-RO shipping services would also require some more adjustments to the procedures, especially the need to facilitate the seamless movement, which is the hallmark of RO-RO transport service.

With the proposed international RO-RO terminal, there would be a need to construct a passenger terminal at the old Butterworth Terminal. A consolidated CIQS floor/building would be best for better and more efficient services.

I**mmigration Regulations**: Since the port is a popular port of cruise ships and tourist passengers, it is experienced in handling international passengers. However, it is noted that

one problem occurred at the difference between regulation and actual service. It was reported that an Indonesian fast boat passenger was denied entry because he was not carrying enough “personal expense money” or “allowance money” for his intended stay in Malaysia. When he returned the next time carrying the amount previously suggested, he was again denied entry because there is a new amount as a new minimum of threshold amount. The Malaysian fast boat operator pointed this unclear immigration service as one of the reasons why the operator suspended business in 2010. Immigration service must be done under officially announced regulations.

Quarantine Regulations, Port Security, Recognition of Driver’s License and Vehicle Registration: Necessary arrangement matters are the same as with the Port of Belawan.

(3) Phuket Port

Port Policy: There is no policy conflict to serve international RO-RO shipping.

Customs Regulations, Immigration Regulations, Quarantine Regulations, Port Security: The Port of Phuket is a regular port of call of cruise liners and international cargo vessels. As such, the port is experienced in handling importations and international passenger movement. However, existing CIQ facilities are limited. The port plans to develop a new passenger building. Necessary passenger related CIQ facilities will be installed in the building. To receive international RO-RO ship calls, the port needs to develop vehicle terminal with related CIQ facilities.

Port Security: Although the Port of Phuket regularly handles international traffic in terms of cruise liners and international cargo vessels, security at the port needs priority since it was noticed that the entry to the port is not controlled.

Recognition of Driver’s License and Vehicle Registration: There is a translation issue of Thai language as mentioned with the Port of Belawan. The recognition of vehicle registration (and the related vehicle insurance) would not present a formidable issue as seen in the cross-border movement of vehicles in the mainland between Malaysia and Thailand. The same principles and guidelines can be applied to cross-border movement via the RO-RO service, and expanded to include Indonesia.

16 THE DAVAO/GENERAL SANTOS – BITUNG ROUTE

On the route, the Sasa Wharf of Davao Port needs sufficient rehabilitation for the time being. However no alternative port in Davao has been identified to receive international RO-RO shipcalls during the Study. Under such situations, the Study conducted only stakeholder interviews in Davao while port and its institutional issues were not analyzed. It is advisable to the responsible Philippine authorities to the project that similar analytical works with other ports in the report be done at one of Davao ports where an international RO-RO terminal is developed immediately after the port is selected.

16.1 Stakeholders' Views

The Study Team interviewed 101 stakeholders along the routes. Like in the other RO-RO shipping routes, the stakeholders in the General Santos-Bitung route are unified in viewing the new shipping service as a positive development and contributor to their businesses and local economies. It is interesting to note that even if these traditional bilateral partners are eager to open up their respective economies to greater international trade, both sides are also cautious about protecting their homegrown industries.

Competitive costs, safety, comfort, convenience and reliability are the most important considerations the stakeholders expect from the RO-RO shipping operations. As in other locations, the stakeholders of the General Santos-Bitung route are also particularly concerned that trade and regulatory issues such as CIQS should be effectively addressed in order to realize the success of the RO-RO service.

Table 16.1 Summary of Stakeholder Views on the General Santos-Bitung RO-RO Shipping Service

Aspect	Converging Views	Diverging and/or Singular Views
Overall Economic Benefits	• The RO-RO shipping service can reduce logistics costs and boost business, trade, tourism, investments, employment and incomes. Government and private sector stakeholders are committed to supporting the development of the route. • It can revive and strengthen bilateral socioeconomic relationships between Indonesia and the Philippines. • Caution should be taken that local industries and small producers are not adversely affected by competing imported products.	
Market	• Stakeholders badly need modern liner shipping service across the route but some do not specify RO-RO vessel. • There is limited cargo trading across the route since there is no existing liner shipping service. There is potential trade if the new shipping service is opened. • Tahuna/Sangihe Regency can be part of the shipping route as it plays a significant role in current trade in the area and is strategically located along the route. • The route can be used as a shorter and cheaper alternative route to transship products from/to China, Taiwan, etc to/from Bitung through General Santos. • The route can open up trading and business opportunities with hinterland areas. • The shipping service can increase travel to other destinations through the Bitung-General Santos connection, particularly for traders, overseas workers and their relatives, students, backpackers and adventure travelers. • Tour operators are not inclined to carry tour buses on the RO-RO vessel considering the left-hand vs. right-hand driving limitation. It would be more practical and economical to rent tour vehicles with competent local	

Aspect	Converging Views	Diverging and/or Singular Views
	drivers at the other side.	
Infrastructure	• The RO-RO port facilities should be adequate and should not cause any delay or inconvenience to cargo loading/ unloading and vehicle/ passenger movement.	• The General Santos Port has experience with RO-RO shipping operations (domestic). Existing and future facilities can be prepared for international RO-RO shipping operations. • The Davao and Glan ports should also be developed for the RO-RO shipping service.
Legal and Institutional Issues	• The new route might foster smuggling, human trafficking, terrorism, crime. • CIQS and other regulatory issues that may affect the RO-RO operation should be properly addressed. • The left-hand vs. right-hand drive orientation in the Philippines and Indonesia, respectively, will be a major issue hindering the movement of vehicles across the route. • The new service should be strongly supported and aggressively promoted by government and business sectors.	• Government and local stakeholders need to level off on the real status of Bitung Port as an international gateway port.
Costs	• Freight and passenger rates on the RO-RO should be competitive with current costs incurred by shippers and passengers using alternative transport routes and modes. Acceptable roundtrip passenger fare rate should be USD120-200. • Port tariffs should be competitive and should not make overall logistics costs very expensive. • Initial operations of the RO-RO may need to be subsidized until it becomes sustainable.	
Ship Facilities	• The RO-RO vessel and operation should be safe, seaworthy, secure, comfortable and convenient both for cargo and passengers. • The RO-RO operation should observe a regular and stable frequency of service. • The vessel type and size should meet the requirements of the users.	• General Santos cargo stakeholders see the lack of container chassis as a potential problem for RO-RO operations. There should be a provision for this. • Some stakeholders think the RO-RO is an unstable vessel to carry cargo and passenger vehicles on a long-distance route especially during rough sea conditions.

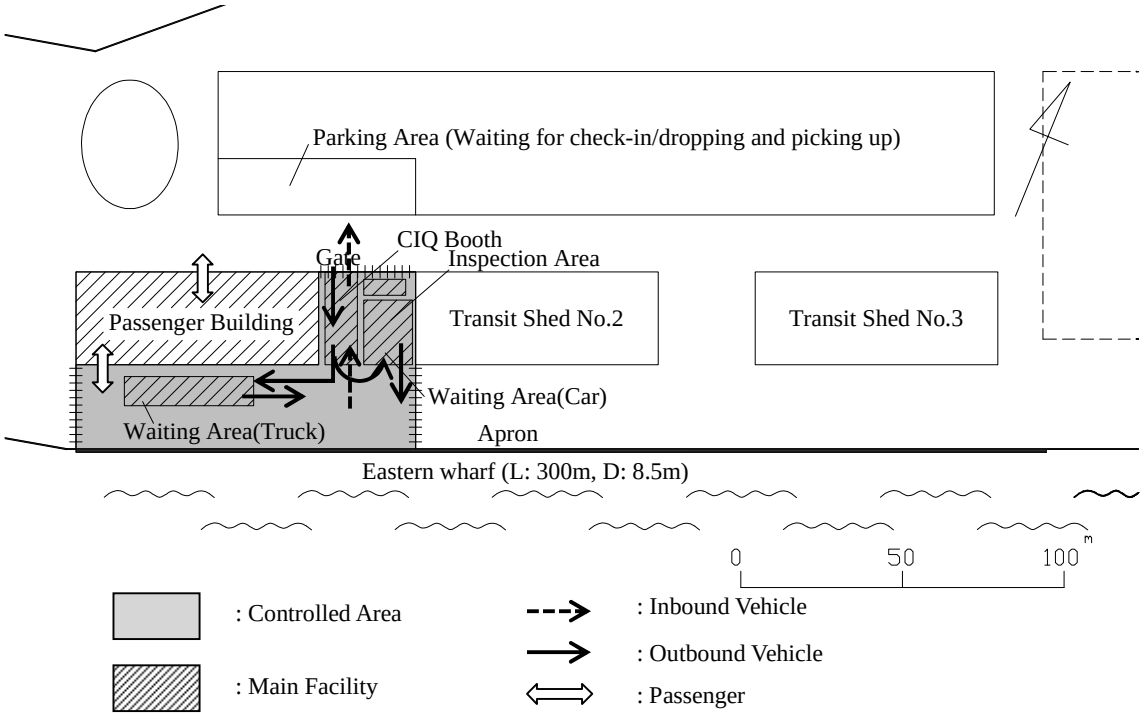
Source: General Santos/ Davao and Manado/ Bitung Field Surveys, JICA Study Team, 2012

16.2 Infrastructure Preparation

(1) General Santos Port

PPA's General Santos Office considers that the eastern part of Eastern Wharf is an appropriate location for the international RO-RO terminal. The Eastern Wharf is 850 m long with its water depth of 8.5 m. The apron is 19 m wide and it is not sufficient to handle a 40-foot container trailer.

Transit shed No.1 is under conversion to domestic passenger terminal. Passenger CIQ facilities will be installed in the building to receive international shipping passengers. The port office reserves the space between Transit Sheds No.1 and No.2 and part of the wharf apron for vehicle terminal. To undertake vehicle terminal operation at the site, its cost is estimated at US$ 40,000.



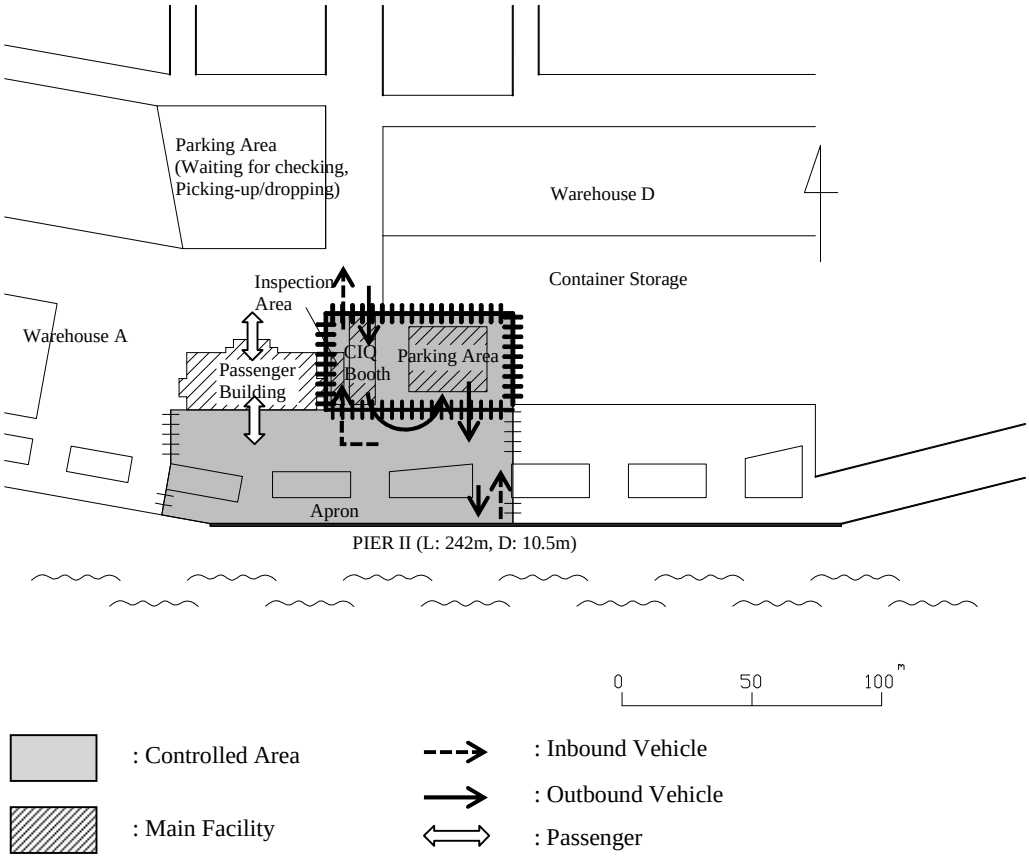
Source: JICA Study Team

Figure 16.1 Terminal Layout and Traffic Flow in the Terminal at General Santos Port

The Davao – General Santos road section (161 km) is a part of ASEAN Highway No. 26 as well as TTR. The BIMP-EAGA Implementation Blueprint 2012 – 2016 prioritizes to rehabilitate this section with a project budget of USD 21.3 million. The scheduled implementation is anticipated for better port hinterland connection.

(2) Bitung Port

The Bitung Office of PELINDO 4 thinks that Pier II, which is now used for PELNI's domestic passenger ships, is adequate to accept an international RO-RO vessel. Pier II is 242 m long and its water depth is 10.5 m. The pier is a detached pier type structure with 19 m wide apron. It is not sufficient to handle a 40-foot container trailer. The 2-floor passenger building can be used. The port office reserves a 70m-by-40m site adjoining the passenger building for a vehicle terminal. The cost to prepare the vehicle terminal is estimated at US$ 60,000.



Source: JICA Study Team

Figure 16.2 Terminal Layout and Traffic Flow in the Terminal at Bitung Port

The Manado – Bitung road section has been gradually congested. The Manado –Bitung toll road project (49 km, USD 400 million) was planned to be a bypass to the existing road when the Japanese Yen loan project for Bitung Port was agreed in 1996. The project has not been completed and thus the BIMP-EAGA Implementation Blueprint 2012 – 2016 prioritizes it. Project completion is urgently required. It is noted that the roads in Sulawesi Island is not included in the ASEAN Highway Network Project.

16.3 Shipping Strategy and Ship Operation Plan

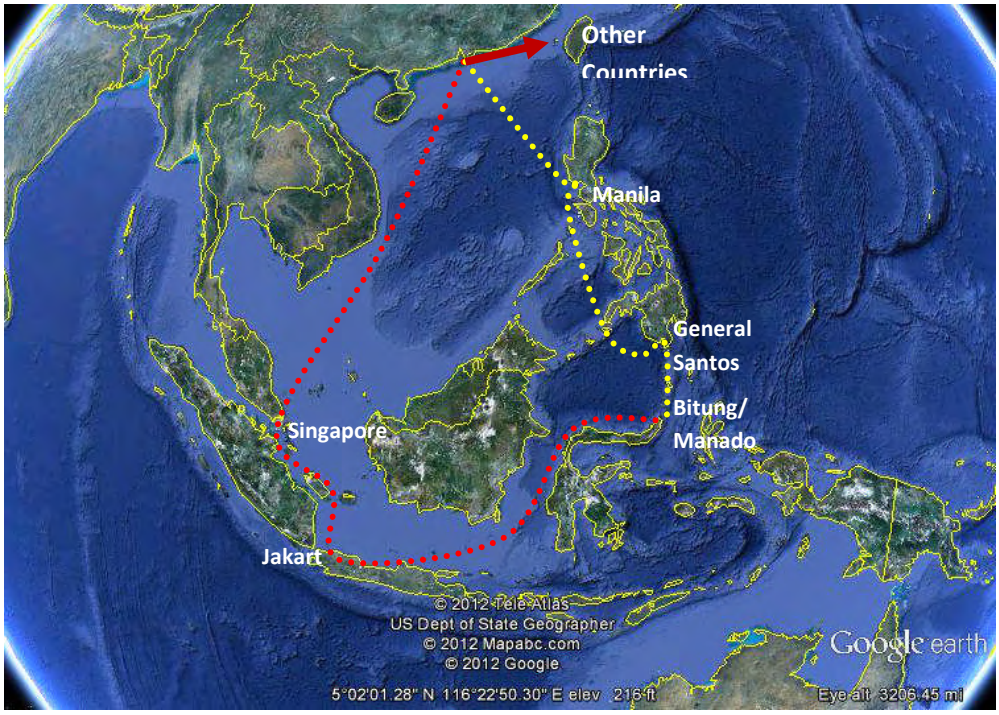
(1) Potential Traffic Demand

Since there is no regular shipping service for break-bulk cargo on the Gensan – Bitung route, the Team observed small cargo volume by small cargo vessel and many small NCVs at the ports of Tahuna and Marore.

Through the stakeholder interviews, on the other hand, various potential cargoes have been identified. They are physically divided into two: (i) potential cargo along the route and (ii) potential cargo beyond the route.

In regard to (i), the Study identified the biggest demand segment on the route. It is frozen tuna and other fishery products. RO-RO vessel is suitable to carry them in good quality.

In the case of (ii), the sailing distance from Hong Kong to Bitung via Singapore and Jakarta is about 3,300 nm (6,112 km), while that via Manila and General Santos is around 1,750 nm (3,241 km). It means the new route will be able to offer greater sailing distance reduction as illustrated below.



Note: Red dot line – via Jakarta and Singapore, Yellow dot line – via General Santos and Manila

Figure 16.3 Comparative Distances of Shipping Routes between Hong Kong and Bitung

Those potential cargo demand volumes are indicated in Table 16.2. It shows larger traffic demand from North Sulawesi to South Mindanao by over 4 times than the adverse direction.

Table 16.2 Potential RO-RO Cargo Demand between Gensan/Davao and Bitung/Manado/Tahuna

Yearly Demand	From Gensan/Davao to Bitung/Manado/Tahuna	From Bitung/Manado/Tahuna to Gensan/Davao
Convertible Cargo Demand *	600 tons	100 tons
Inducible Cargo Demand (i) **	15,184 tons	68,328 tons
Inducible Cargo Demand (ii) ***	3,240 tons	19,128 tons
Total (tons/year)	19,024 tons	87,556 tons

*) Estimated general cargo ship and NCV trade at the Sangihe Islands in 2012
**) Potential yearly cargo volume along the Gensan-Bitung route in 2015 among interviewed stakeholders
***) Potential yearly cargo volume beyond the Gensan-Bitung route in 2015 among interviewed stakeholders

Source: JICA Study Team

Similar to cargo, direct passenger traffic between North Sulawesi and South Mindanao is limited due to the absence of any regular direct transport service on this route. The tourism agents/tour operators interviewed doubt a possibility of mass tourism by RO-RO shipping service due to long sailing time and local tourism market size. Therefore a modest marketing strategy is adopted to focus on:

- Vehicle drivers, workers, students, backpackers and other cost sensitive passengers provided that the proposed RO-RO shipping service would offer the least tariff in comparison with other services.

(2) RO-RO Shipping Traffic Plan

The forecast is estimated from the present potential of demands shown in the table below by the growth ratio and some assumptions.

Table 16.3 RO-RO Shipping Traffic between General Santos and Bitung (Weekly, 2015-2035)

Weekly Two-Way Traffic		2015	2020	2025	2030	2035
Passenger	Total person	280	330	380	450	520
	(non vehicle)	(218)	(264)	(310)	(376)	(440)
Vehicle	Car	10	12	14	16	19
	Bus	0	0	0	0	0
	Truck	28	28	28	28	28
Container (without chassis)		24	30	35	43	50
Cargo Total (ton)		320	360	400	450	510
Featured haulage	Bitung => General Santos	- New tourist markets should be developed in both countries. - Fish related products, Tuna products, Coco fiber				
	General Santos => Bitung	- Daily commodities from east Asian countries and North America.				

Source: JICA Study Team

The cargo demand forecast result is assessed in comparison with the convertible and inducible RO-RO cargo demand as follows: (Refer to Table 16.2)

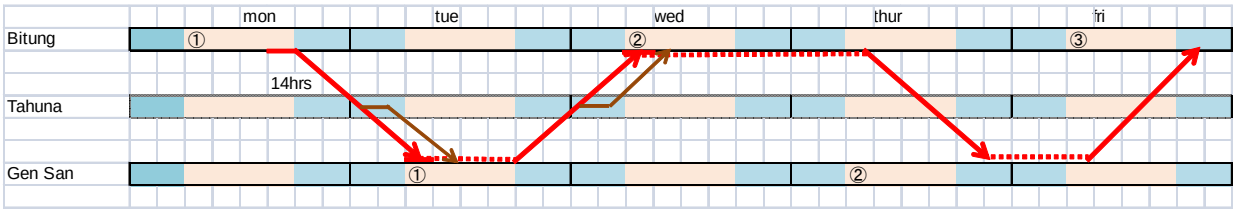
- Existing direct shipping volume is scarce. The cargo to be converted from the direct shipping volume is far from the sufficient level to meet the projected RO-RO shipping demand.
- Due to imbalanced cargo demand flows, the proposed RO-RO shipping will transport an Indonesian cargo of 192 tons/week or 9,982 tons/year in 2015. The amount is equivalent to 11.4% of the all convertible and inducible cargo from Bitung/Manado/Tahuna to Gensan/Davao.
- The proposed RO-RO shipping will transport a Philippine cargo of 128 tons/week or 6,656 tons/year in 2015. The cargo volume accounts for 35.0% of the all convertible and inducible cargo from Gensan/Davao to Bitung/Manado/Tahuna.

The result of passenger demand forecast anticipates many walk-in passengers (78% of all RO-RO shipping passengers). The vehicle forecast result includes passenger cars and trucks. Assuming that one truck is equivalent to three (3) cars in terms of floor occupancy, trucks account for around 89% of the vehicle space in the ship.

(3) Ship Operation Plan

Both Indonesian and Philippine RO-RO shipping operators have shown their interests in the route to the Study Team during the field surveys. However many of them considered operational subsidy and other financial supports necessary in providing services. It is noted that the Memorandum of Cooperation was made among local chambers of commerce and industry and other entities for the Bitung – General Santos – Davao RO-RO shipping link in November 2012. One participating signatory is Asian Marine Transport Corp. which provides 'Super Shuttle' RO-RO/ROPAX services in the Philippines.

One RO-RO vessel will ply twice a week between General Santos and Bitung. When there is substantial demand at Sangir Besar Island, the vessel will drop by Tahuna Port as an optional arrangement. When vessel space tightens due to increased demand, one more round trip will be added in the operation plan.



Note: Brown Line shows an option to drop by Tahuna Port.

Source: JICA Study Team

Figure 16.4 Ship Operation Plan on the General Santos – Bitung Route

16.4 Preliminary Ship Design

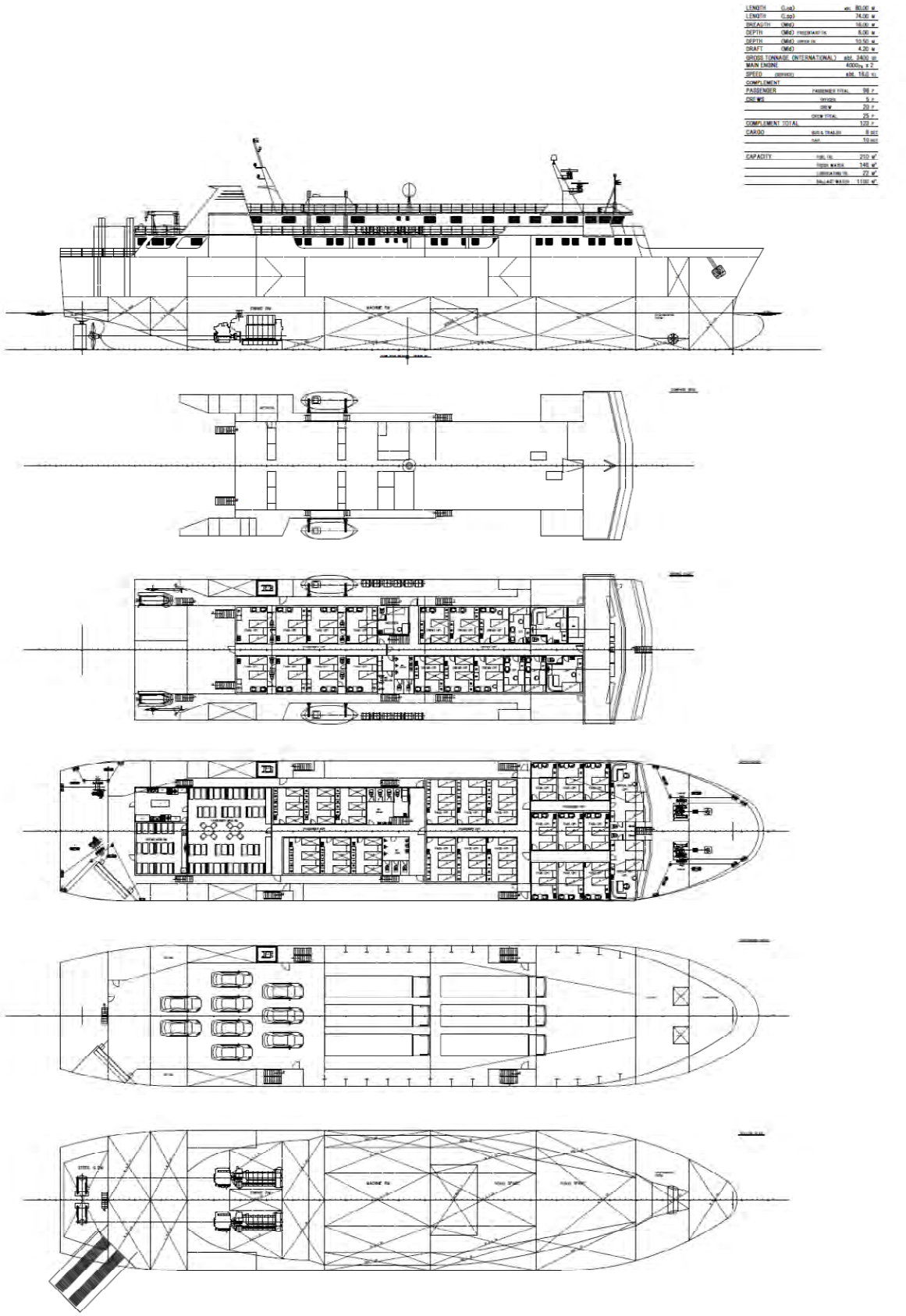
In addition to the requirement regarding cargo and passenger loading capacity indicated in the demand forecast as shown in the previous paragraph, important facts and conditions are considered in a comprehensive manner in the preliminary ship design for General Santos – Bitung route, including (i) port to port distance, 302 nm (559 km), (ii) sea conditions on the route where generally calm around the year, (iii) ship operation plan, and (iv) docking conditions – the vessel uses its stern quarter ramp without no specific boarding facility at the port.

The new construction cost of US$ 18.75 million is estimated.

Table 16.4 Principal Particulars

Length over all	Approx. 80.0	m
Length between perpendiculars	74.0	m
Breadth	16.0	m
Depth	10.5	m
Draft (design)	3.8	m
Gross tonnage (international)	3400	T
Maine engine	5001	kw
Service speed	Approx. 16.0	Kt
Loading capacity		
Truck/cargo	Approx 300	Ton
Passenger car	6	Unit
Passenger	98	Person
New shipbuilding cost	18.75	Mil $

Source: JICA Study Team



Source: JICA Study Team

Figure 16.5 General Arrangement Plan for the RO-RO Vessel on General Santos - Bitung

16.5 Institutional Arrangement

(1) General Santos

Port Policy: The Port of General Santos or Makar Wharf is an international port to directly connect with foreign ports. There is no policy restriction to connect with Indonesian ports.

Customs Regulations: The Philippines does not have much experience in handling vehicles in transit. Few examples are the cars for exhibition and racing, etc. The usual treatment for vehicles entering a Philippine port would be as imported goods subject to import taxes and duties. However, if a national directive is issued by the Commissioner of the Bureau of Customs for special treatment of RO-RO vehicles or even RO-RO chassis, it shall be uniformly applied nationwide, including at the Port of General Santos. The proposed solution would be drafting of an MOU between the Philippine and Indonesian government to this RO-RO route.

The development of RO-RO service on this route would exert pressure on Customs service to be on guard against contraband goods. There is an expansion plan for the port. It was suggested to the Port Manager to also consider the development of a passenger terminal and CIQS building.

Immigration Regulations: With the introduction of an international RO-RO service, the port would need a more comprehensive immigration services for passengers than just for the crew of foreign vessels. The immigration officials should also be on the lookout against human trafficking and cross-border movement of unwanted elements.

Quarantine Regulations: The trade between General Santos and Bitung is expected to handle a lot of agricultural and meat products to be traded between the Indonesian and Philippine sides. This highlights the need for quarantine procedures to safeguard against the spread of diseases, whether it be on persons, plants or animals.

Port Security: To be ISPS Code compliant, the proposed international passenger terminal and vehicle holding area should be located within the foreign service area of the port and fenced off from the domestic service area of the port. The access to the international passenger terminal, the holding area for international RO-RO vehicles or container chassis and the port apron for international operations should be controlled.

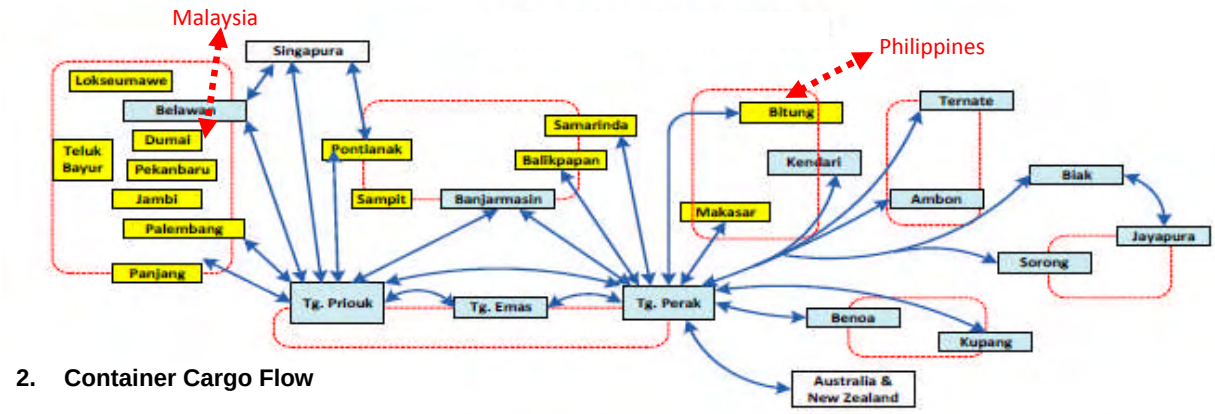
Recognition of Driver's License and Vehicle Registration: The main stumbling block is the fact that the Philippines has a law (Republic Act 8506) banning the registration and operation of a right-hand-drive vehicle in the country, except for some special cases, wherein the Department of Transportation and Communications would issue an exemption.

The provisions of the law, however, would not be applicable to a container chassis. One solution would be to use the container on chassis or what is also called CHARO (chassis RO-RO), and the prime movers from either side of the route would be used on their side.

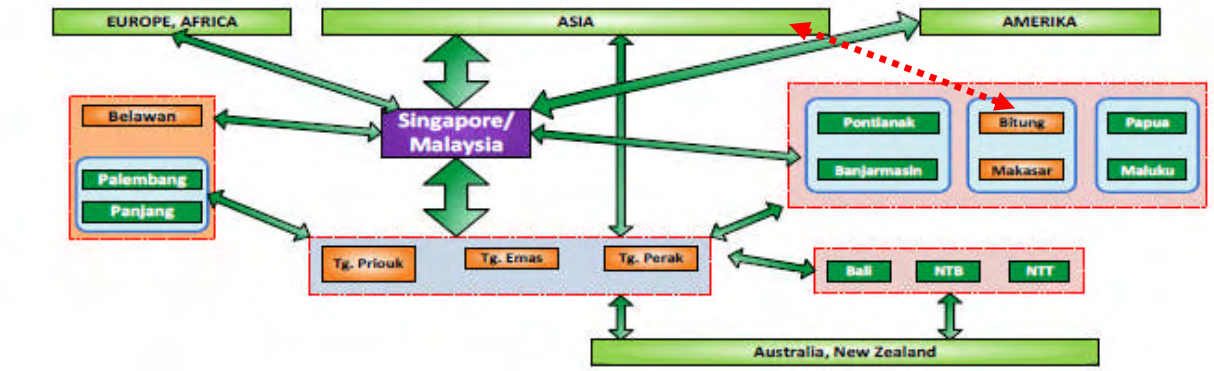
(2) Bitung

Port Policy: The provincial government of North Sulawesi and local business groups such as KADIN (chamber of commerce) are keen on internationalization of Bitung Port. The port may accommodate foreign ship calls. But the number is limited so far such as only Singapore connected container service in liner shipping. Relevant government regulations do not encourage Bitung Port as an international port such as Ministry of Transportation Regulation No. 62/2010 regarding Working System of Port Organization which classifies Bitung Port as 'National Port' not 'International Port'. According to Presidential Regulation No. 26/2012 regarding Blueprint of National Logistic System, there is no international connection between Bitung and Philippine ports.

1. Conventional Cargo Flow



2. Container Cargo Flow



Note: ◄·····► Identified Missing Links by JICA Study Team

Source: Presidential Regulation No. 26/2012, Indonesia

Figure 16.6 Blueprint of National Logistics System, Indonesia

Customs Regulations: There has not been much vehicles-in-transit using the Port of Bitung. The treatment of vehicles coming to a port would be the same as in all other Indonesian ports, they will be treated as imported goods and subject to import taxes and duties or bond guarantee. The proposed solution would be drafting of an MOU between the Philippine and Indonesian government to this RO-RO route.

Immigration Regulations, Quarantine Regulations, Port Security: Necessary arrangement matters are the same as with the Port of General Santos.

Recognition of Driver's License and Vehicle Registration: The recognition of driver's license is not a contentious issue as it is a usual courtesy given in almost all countries to foreign visitors, as long as it is in a language recognized by the country. For drivers from the Philippines their licenses are in the English language.

17 ROUTE EVALUATION AND IMPLEMENTATION PLAN

17.1 Financial Analysis

Taking demand forecast, operation plan and ship procurement cost into account, financial flows (cost and revenue) of each RO-RO route are calculated for 20 years from 2015 to 2034. All necessary costs such as bunker cost, port charge, crew expense, docking etc. are included in accordance with present market prices.

Capital cost is calculated on the method of straight line depreciation in 20 years. It is assumed that the capital is injected for 15% of the initial investment and the rest or 85% comes from two types of bank finance.

(Type 1) A financer is supposed to be an international financial institution, e.g. offering an attractive interest rate for buyer's credit yen loan with a condition of level payment in the term of 20 years.

(Type 2) A financer is supposed to be a commercial bank, e.g., offering a prime lending rate of US dollar loan with a condition of level payment in the term of 20 years.

With the assumptions of shipping tariff and ship price, financial internal rate of return (FIRR) is calculated by route below.

Table 17.1 Summary of Tariff and Profitability

			Belawan - Penang - Phuket			
		Dumai - Malacca	Belawan - Penang	Penang - Phuket	Phuket - Belawan from 2025	Bitung - Gen San
distance	n.mile	58	140	198	242	302
ship speed	kt	14	20			16
sailing hour	hours	4	7	9.9	12.1	18.9
no.of round trip /week	no.	14	2	1	1	2
		by 2 ships				
freight tariff	one way					
passenger	us$	$25	$40	$45	$50	$100
car	us$	$200	$200	$220	$240	$600
bus	us$	$540	$540	$560	$580	$1,400
truck	us$	$640	$640	$660	$680	$1,500
cargo	us$/MT	$0	$0	$0	$0	$150
		included to truck				cont'r cargo
particular of ship						
L oa/Lpp	m	61.0/56.6	120.0/110.0			80.0/74.0
BxD -dft	m	14.2 x 9.5	20.0 x10..5 -4.5			16.0x10.5 -3.8
internatinal GT	GT	1,920	9,150			3,400
Passenger	no.	250	400			98
car/truck	no.	7/10	-/49			6/6
engine power	PS	4,000	15,000			6,800
generator power	KW	300	800			600
bunker price	us$/ton	700	700			700
ship finance						
ship price(new build)	000us$	25,000	35,000			18,750
total investment	000us$	27,500	38,500			20,625
capital amount(15%)	000us$	4,125	5,775			3,094
loan interest (Type 1)	%p.a.	1.40%	1.40%			1.40%
loan interest (Type 2)	%p.a.	4.00%	4.00%			4.00%
FIRR (Type 1)	%	**13.29%**	**18.40%**			**5.58%**
FIRR (Type 2)	%	**8.91%**	**10.70%**			**1.19%**

Source: JICA Study Team

The profitability of the Dumai – Malacca route is relatively good. A deficit of net income will be posted in starting 5 years and a profit will appear in the 6th fiscal year in the case of the Type 1 loan. Thereafter the profit will increase year by year according to cargo volume increase. In the case of the Type 2 loan, a deficit of net income will be posted in starting 7 years and a profit will appear in the 8th fiscal year. Because of purchasing two small vessels, initial cost and operational cost are relatively high. Due to the limit of the existing berth facility at Dumai Port, however, it cannot accommodate one larger vessel instead of two small vessels.

The profitability of the Belawan – Penang – Phuket route is the best among 3 priority routs. A deficit of net income will be posted in starting 2 years and a profit will appear in the 3rd fiscal year in the case of the Type 1 loan. Thereafter the profit will increase year by year according to cargo volume increase. In the case of the Type 2 loan, a deficit of net income will be posted in starting 6 years and a profit will appear in the 7th fiscal year. The fuel consumption is biggest among 3 routes due to high operating speed and the largest ship size among the 3 routes. The ratio of bunker expense is relatively high which would give a negative impact to profitability when the price of bunker soars up.

The profitability of the Bitung – General Santos route is not attractive as a business investment. A deficit of net income will be posted during 8 years long and first profit will appear in the 9th fiscal year in the case of the Type 1 loan. Thereafter a profit will increase year by year according to cargo volume increase. In the case of the Type 2 loan, a deficit of net income will be posted in starting 10 years and a profit will appear in the 11th fiscal year. Since cargo demand is relatively small in this route, the number of round trips in a week is planned at only two. That is one of the reasons for the low FIRR. But three round trips can be arranged when ship hull occupancy becomes high. Calling at Tahuna Port may improve the profitability if additional ample demand is found.

There is another option to improve the feasibility – procurement of second-hand vessels instead of newly constructed vessels. Under the same conditions above, FIRRs of the 3 routes would jump to 42.41%, 60.3% and 26.8%, respectively, if 20-years-old second-hand vessels could be procured at the beginning of the project and they could be replaced with other second-hand vessels after the 10-year operation. Under the tight second-hand RO-RO fleet market, it must be difficult to find an appropriate vessel in terms of type, size and age.

Other modes of ship deployment include ship chartering and ship lease:

- Ship chartering is popular in tanker shipping and dry bulk shipping. Chartering is not popular to liner business and RO-RO shipping has small fleets in the world. There is no charter rate published for RO-RO ships and therefore the Study did not undertake financial analysis. It is noted that ship chartering is widely accepted in some ASEAN Member States such as the Philippines.
- Ship lease is considered a suitable method for long-term ship usage, like liner shipping business. It allows the lessee to enter into shipping business with a small investment while the lessor supervises the lease asset and provide professional advice on ship construction/secondhand ship procurement, ship operation and ship maintenance. But the ship lease business must charge commercial lending rate plus their management fee (2-3%) on ship lease asset. The FIRR must be reduced by ship leasing management fee accordingly.

The Study concludes the two routes of Dumai - Malacca and Belawan - Penang - Phuket are financially viable but the Bitung - General Santos route is not viable unless purchasing a second-hand vessel and/or receiving operational subsidy.

17.2 Economic Analysis

Existing shipping services vary among the priority routes and thus expected benefits when introducing RO-RO shipping service also vary. For example, on the Dumai – Malacca route most of break-bulk cargo is currently traded by NCVs while on the Belawan – Penang route container vessels and NCVs are frequently traded.

The following benefits can be brought about by RO-RO shipping service. The Study evaluates them quantitatively as follows:

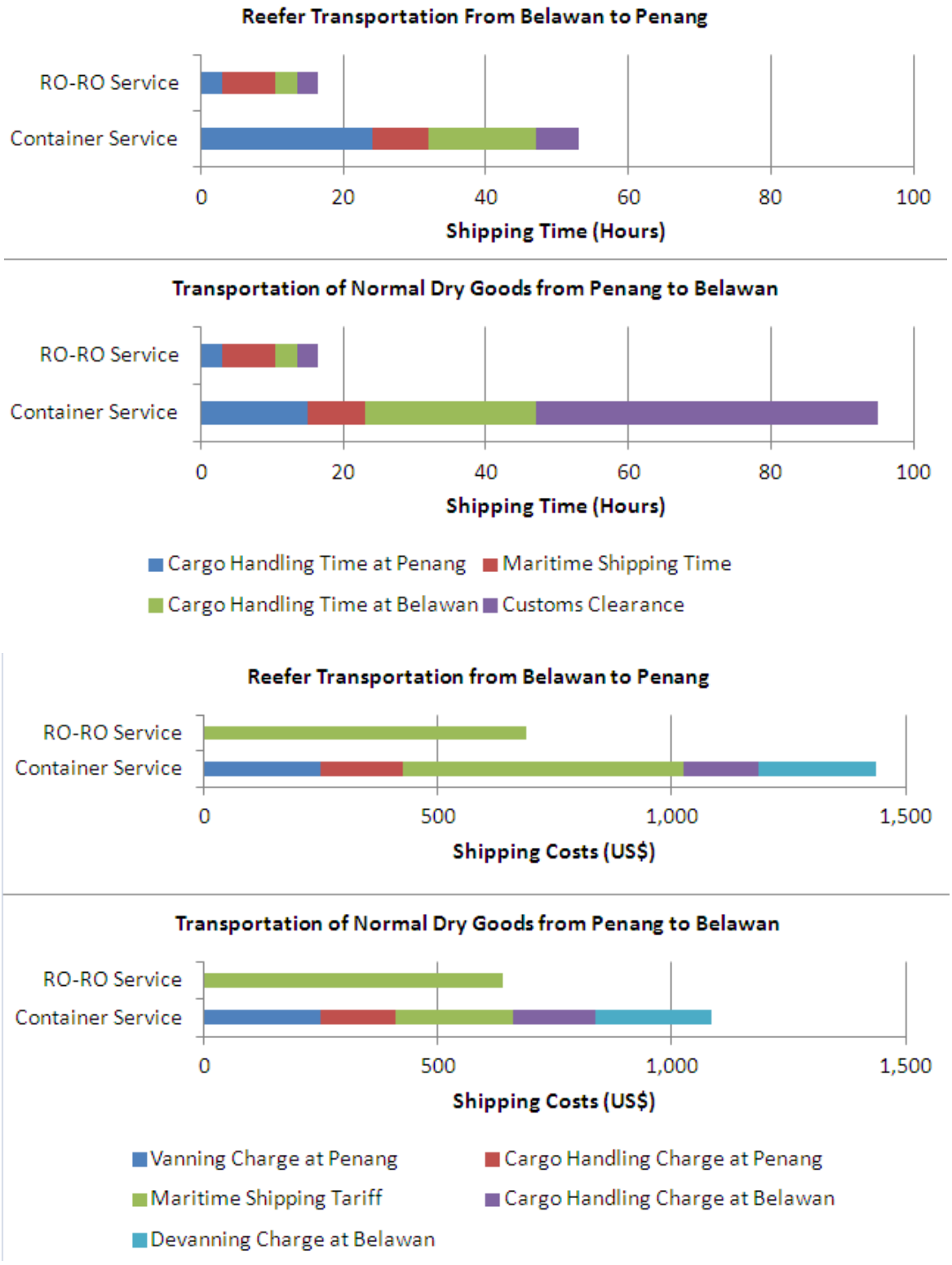
(1) Decrease of transit time: RO-RO service will greatly reduce waiting time at the origin port and cargo unloading time at the destination port. Smooth customs clearance at the destination port is also essential.

(2) Decrease of cargo damage: Cargo transported by RO-RO vessel can avoid damages thanks to the direct loading/unloading with trucks while cargo shipped in a container suffers unnecessary damages in cargo stuffing and consolidation and container loading/unloading. As a result, cargo owners' sales may increase.

(3) Decrease of shipping cost: Since cargo is directly loaded to and unloaded from RO-RO vessel with trucks, vanning/devanning charges and cargo handling charges are not necessary. Shipping cost cannot be lower in all cases but if the sales increase due to decrease of cargo damage as mentioned below are larger than the cost increase, cargo owners and forwarders will choose the new route based on the economic rationality.

The following figures show benefits per transporting 1 TEU or 10 tons of cargo if a container service between Belawan and Penang and a NCV service between Dumai and Malacca are diverted to a new RO-RO service.

In addition, positive economic effects to tourism, foreign trades and promotion of industry in the hinterlands are expected. Although those are important benefits in local economic development, the quantitative analysis in relation with new RO-RO shipping service is difficult. Therefore the Study notes them as qualitative benefits.



Source: JICA Study Team

Figure 17.1 Reduction in Shipping Cost and Time by a RO-RO Service on the Belawan – Penang Route

Source: JICA Study Team

Figure 17.2 Reduction in Shipping Time and Increase in Shipping Cost by RO-RO Service on the Dumai - Malacca Route

The RO-RO shipping development will cause apprehensions as follows:

- Environmental burden: Operating a RO-RO vessel needs more fuel oil per cargo weight due to their relatively larger dead spaces.
- Competition with existing shipping services: Existing freight shipping operators will be affected by the new RO-RO service. But it may be marginal since anticipated trade increase will be bigger than the predicted cargo to be diverted to the new RO-RO

shipping. On the other hand, there will be no passengers diverting from fast passenger crafts and/or LCCs and thus those will not be affected.

- Higher logistics cost: As mentioned above, logistics using RO-RO sometimes costs higher because of higher ship price and fuel oil cost. The additional logistics cost might be reflected to sales prices.

17.3 Implementation Plan

The Implementation Plan or mile stones until the opening of new RO-RO shipping service on the priority routes are proposed in Table 17.2. A critical factor for its success is that all the relevant government agencies will be involved in the implementation plan.

The engagement of route-wide MOU among the connected central governments is located at a middle point of the implementation plan. Before this MOU, all institutional arrangement and its related connecting countries' coordination will have to be done to ensure smooth seaway and highway connection including temporary admission of foreign road transport vehicles without security deposit and import duty.

New shipbuilding and RO-RO terminal preparation need considerable investment for the ASEAN RO-RO shipping project and their works take one and half years at most. Meanwhile, the 'Brunei Action Plan' or the ASEAN Strategic Transport Plan 2011-2015 indicates the deadline to implement the Study's proposed measures by 2015.

As it is desirable that route-wide MOUs would be engaged prior to investments in ships and ports, adequate timings to engage route-wide MOUs are as follows:

- The Dumai – Malacca route: It is preferable at the end of 2013. The route development plan includes small-sized ships and small investment in ports. Taking such investment volumes into account, a route-wide MOU should be engaged no later than the middle of 2014.
- The Belawan – Penang – Phuket route: It is badly needed at the end of 2013. Provided that the preliminarily designed ship (9,150 GT) would be constructed, it must take one and half years. No delay time is allowed to engage a route-wide MOU.
- The Davao/General Santos – Bitung route: It is preferable at the end of 2013. Due to low profitability by a new ship, the Study advises to use a second-hand ship. If there is one second-hand ship available with minor modification, a route-wide MOU should be engaged no later than the end of 2014.

Table 17.2 Proposed Schedule for Opening Priority RO-RO Routes

Work Item and Entities in Charge	2013		2014		2015
	First Half	Second Half	First Half	Second Half	First Half
General					
Institutional set-up for international RO-RO shipping service (Sea and Road Transport Administrations, CIQ authorities)	←	→		At appropriate time taking institutional, infrastructure and ship preparation into account	
Engagement of route-wide MOU (Related Central Governments)		← →	▲ ·····	····· ▲	
Detailed Operational Arrangement (Local Governments, Port Operators and RO-RO Shipping Operators)		← →	← - - -	- - -	- - - →
Procurement of RO-RO Ship(s) (RO-RO Shipping Operators)			←	New Shipbuilding →	
			← Procurement & Modification of Secondhand Ship		→
RO-RO terminal development and operation arrangement (Port Authority & Local Government)	←	→			
Development of port infrastructures (Local Government)	(See below)				
Rehabilitation/improvement/construction of port access roads (Local Government & Road Administration)	← - - -	- - -	- - -	- - -	- - - →
Promotion of RO-RO shipping among potential local users (RO-RO Shipping Operators, Local Government)			←	- - -	→
Detailed preparation of CIQS operations at passenger/vehicle terminals (Port Operators, CIQ Authorities)					← →
Port-Specific					
Development of Dumai Port			■	■	■
Development of Malacca Port			■	■	■
Development of Belawan Port					■
Development of Penang Port			■	■	■
Development of Phuket Port					■
Development of Bitung Port					■
Development of General Santos Port					■

Source: JICA Study Team

18 A POLICY AND INSTITUTIONAL FRAMEWORK FOR ASEAN RO-RO SHIPPING

18.1 Policy Coordination and Institutional Harmonization within ASEAN

Over the years, ASEAN formulated a number of transport facilitation initiatives to foster the right environment to create an efficient logistics and multimodal transport system for seamless movement of goods, connecting land, maritime, and air transport. Although these agreements have been signed by Member States, still many protocols of these agreements, especially Protocols 2, 6 and 7 of the AFAFGIT, have yet to be concluded or ratified. In view whereof, the operationalization of these agreements may still be years down the road.

18.2 Recommendations for Policy and Institutional Development

In view of the foregoing issues and concerns, and taking into account the combined results of the field surveys and the country surveys, the Study has identified common legal and institutional issues for ASEAN RO-RO shipping development. The issues are reported with recommended solutions as follows:

(1) Designation of ASEAN RO-RO shipping route as an adjunct to the ASEAN Highway Network

There is no document of regional agreement and consensus building about the designation of ASEAN RO-RO shipping route. Without such an official document, the general public is not aware of the development perspective of ASEAN RO-RO shipping routes/network. However, the ASEAN Framework Agreement on the Facilitation of Inter-State Transport (AFAFIST) briefly mentions RO-RO, where 'means of transport' is defined as road vehicles, including those on-board roll-on/roll-off vessels (Article3, (f)). The AFAFIST also indicates the list of transit transport routes as specified in the Annex of Protocol 1: Designation of Transit Transport Routes and Facilities, under the ASEAN Framework Agreement on Facilitation of Goods in Transit (AFAFGIT), which shall be the designated inter-state transport routes and facilities (Article 6 1.).

If there are RO-RO shipping routes which this Study would find highly feasible and the connecting countries could decide on their early implementation, it is recommended to designate those routes and their ports as transit transport routes and facilities under relevant ASEAN agreements such as AFAFGIT, AFAFIST and the Ministerial Understanding on the Development of the ASEAN Highway Network Project.

(2) Acceptance of transit vehicles

Transit vehicles are not allowed without import duties or deposit Customs' guarantee bonds by the Customs authorities of Indonesia and Philippines. Without acceptance or admission of transit vehicles, international RO-RO shipping cannot carry vehicles in their operation.

Article 16 of the AFAFIST requires the member states to temporarily admit road vehicles. It is suggested to solve this transit vehicle issue when a RO-RO route is designated as a transit transport route between connecting countries.

Although AFAFIST has been signed by the Member States, however, for some countries, like the Philippines, the entry into force of the agreement would only come after its ratification by the legislative branch. It suggested that the Government Ministry or Department that signed the agreement would champion its ratification in their own legislature.

(3) Mutual recognition of driving license, vehicle inspection certificate and vehicle insurance

These are all important to accept transit vehicles' driving capability, roadworthiness and liability. During the field survey, Malaysia and Thailand lay stress on vehicle insurance as one of obligations of transit vehicles.

ASEAN has already harnessed several agreements and protocol for regional transport facilitation. It is suggested to fully implement the agreements when an international RO-RO shipping route starts to operate between the connecting countries. A more immediate remedy on the vehicle insurance issue would be the provision TPL, even at a monthly or quarterly basis only, which would be reasonably cheaper, at the port of entry.

(4) PPP scheme and inventive package

Although there are potential RO-RO operators, the business environment is not yet mature in terms of RO-RO terminal availability and use conditions, and CIQS services.

It is suggested to forge out an attractive PPP scheme and incentive package where public and private sectors' demarcation is explicitly described with a set of incentives in relation to RO-RO terminal usage, RO-RO ship investment and operation. A set of incentives may include a preferential rate or exemption from RO-RO terminal charge, fiscal support to ship procurement and governmental support to ship operation, which could be studied for further scrutiny.

(5) Tentative route-wide arrangement

The AFAFIST adopts the ASEAN - X Formula where two or more member states that are ready, may negotiate, conclude and sign implementation arrangements. However, it may take more time for countrywide preparation rather than early implementation of international RO-RO shipping service. It is suggested to make a tentative route-wide arrangement among connecting countries or work out a specific sub-regional MOU.

In order to introduce international RO-RO shipping among the ASEAN member states, an institutional framework monitoring matrix is prepared for all the member states. It includes customs treatment of RO-RO vehicles, vehicle insurance, LHD vs RHD, other vehicle issues and driver's license. (Refer to Annex 1)

18.3 Route-wide Coordination among Route Connecting Countries

The successful implementation and operationalization of the Muara – Labuan route underscores the fact that, notwithstanding the presence of a number of ASEAN Framework Agreements, the development of a RO-RO shipping route can be hastened through a bilateral agreement between participating countries. This is also in line with the ASEAN – X principle, wherein a number of ASEAN Member States may enter into an agreement following or adopting a general ASEAN Agreement. In line with this, the Consultant has drafted a template Memorandum of Understanding (MOU) between countries involved in the ASEAN RO-RO Shipping Network. The salient features of the MOU are: (Refer to Annex 2)

1. Priority is given to shipping companies or ship operators registered in either of the Participating Parties.
2. It is the responsibility of the vessel operator to plan for an efficient and profitable frequency of service and vessel schedule, in consultation and coordination with the concerned maritime and port authorities of the Participating Parties.
3. Compliance with operational, technical, safety and security standards regulated in the Participating Parties is compulsory.

The ultimate goal would be a true ASEAN Free Trade Area, where there is free movement of people and goods, very much like the European Union or Schengen States. One practical measure to facilitate cross-border traffic is through phased-in and limited entry of vehicles, e.g., allowing commercial vehicles such as trucks and buses first and expanding

the vehicle coverage to private vehicles later on. Such a step-by-step implementation method has been done, and proven practicable on some road cross-border routes under the relevant bilateral, tripartite and sub-regional MOUs within ASEAN. It would also be applicable to ASEAN RO-RO shipping routes when responsible customs authorities have sufficiently addressed risk management issues, such as smuggling, etc., at the beginning of the shipping service.

19 CONCLUSIONS AND RECOMMENDATIONS

1) Conclusions

International RO-RO shipping in ASEAN has a great development potential. There is a growing concern to connect seaways with highways at the regional level. This is why the Master Plan on ASEAN Connectivity in 2010 includes the Study project as one of the priority projects. The Study has assessed some explicit users' benefits from ASEAN RO-RO shipping, including reduced logistics time, decreased cargo damage and new tourism opportunities when travelling with vehicles without interruption on seaways. In conclusion, it is convinced that stronger RO-RO shipping connectivity will offer greater economic and social interchange.

ASEAN, however, has only one international RO-RO shipping experience, i.e., Muara (Brunei Darussalam) – Labuan (Malaysia). In this sense, other regions' experiences are noteworthy:

- Northeast Asia: It plays an alternative means to container shipping within Japan, Korea and China.
- Europe: It is a dominant short sea shipping means within a quasi-domestic market. Recently EU promotes the modal shift from road transport to RO-RO shipping due to environmental protection.

While the development potential of ASEAN RO-RO shipping is significant, there are a number of conditions to be met to realize the expected effects. The development conditions are broadly divided into three, as follows:

1) Specific demand which can afford RO-RO service: In general, RO-RO shipping tariff is not cheap compared with other cargo shipping service due to peculiar ship space utilization such as the dead space between vehicle roof and hull ceiling. The Study has identified RO-RO shipping preferred cargoes such as perishable and valuable break-bulk goods. For passengers, the Study has suggested new tourism opportunities which are complementary to prevailing LCC service and existing passenger shipping service, e.g. bus tours and nighttime sailing, medical tourism by car. A RO-RO shipping business plan could capture those demand segments from convertible demand of other existing service and inducible demand among local stakeholders. However ASEAN is not accustomed to international RO-RO shipping due to limited practices. In order to enable new RO-RO shipping service to capture sufficient demand, not only RO-RO shipping operators but also governments and local economies should collaborate.
2) Vessel and Terminal: Even though RO-RO shipping does not require considerable port investment, it needs a terminal where a RO-RO vessel can be berthed safely and vehicle and passenger flows are separately arranged. As case studies, some combinations of vessels and terminals have been designed on the priority routes. Since the proposed vessel and port systems on the priority routes vary from each other, there is no universal design for ASEAN RO-RO shipping. An appropriate vessel and terminal system should be designed according to a RO-RO shipping route development plan.
3) Legal and Institutional Framework: The Study has confirmed that this is the most critical aspect for ASEAN to develop its RO-RO shipping system. For the seaways and highways connection as envisaged by ASEAN RO-RO shipping, road transport

has many institutional issues to be coordinated. The biggest issue is temporary admission of foreign road transport vehicles without security deposit and import duty by customs authorities. The Study has raised and discussed those issues intensively. Regardless of the efforts, the Study has not paved the way to smooth vehicle flows on the seaway and highway connected routes particularly in Indonesia and the Philippines. The continuous discussions should be a must to forge out practical solutions among land and sea transport administrations and CIQ authorities.

2) Recommendations

The Study confirms that ASEAN RO-RO shipping is a significant regional endeavor to develop an alternative liner shipping system and to strengthen the connectivity between seaways and highways in a seamless manner. It is firstly recommended that all Member States participate in the development of ASEAN RO-RO shipping.

ASEAN transport facilitation agreements covering goods in transit (AFAFGIT), inter-state transport (AFAFIST) and multimodal transport (AFAMT) provides the relevant guiding and implementing principles to address among others the key institutional bottlenecks and constraints of ASEAN RO-RO shipping. It is therefore recommended that those regional agreements be fully ratified and effectively implemented at the possible early stage when ASEAN RO-RO shipping develops its network.

The Study has elaborated the institutional framework monitoring matrix among the Member States. The matrix shows current situation and interim goal which enables to participate in ASEAN RO-RO shipping network by country. It is recommended that the Member States facilitate their legal and institutional development in line with the matrix, as a guideline.

The Study has produced the early implementation plans of the three priority routes. It is recommended that the priority routes be implemented by 2015 as long as ASEAN sets this timeline. They are:

(1) The Dumai – Malacca Route;

(2) The Belawan – Penang – Phuket Route; and

(3) The Davao/General Santos – Bitung Route.

Due to different and inherent conditions of ports, seaways and local demands among the priority routes, the Study has worked out development plans for individual priority routes including international RO-RO terminals, preliminary ship designs, ship operation plans, etc. and evaluated them. As a result, (1) the Dumai – Malacca route and (2) the Belawan – Penang – Phuket route are rated to be financially affordable to assign adequately designed brand-new ships. On the other hand, (3) the Davao/Gensan – Bitung route needs intensive demand finding and boosting measures due to scare existing traffic on the route. A second-hand ship is imperative to make the route financially operational. Prior to the development of the priority routes, it is recommended to carefully review the planning contents in the report.

In order to implement the priority projects under successful coordination among the stakeholders and the relevant government agencies, the following recommendations are made:

- For priority routes connecting countries:
  a) To arrange smooth vehicle/passenger flow and take necessary risk management of RO-RO shipping among related sea and road transport administrations and CIQ authorities including temporary admission of foreign road transport vehicles.
  b) To engage a route-wide MOU which indicates RO-RO shipping business environment such as the demarcation of government and RO-RO operator's roles.
  c) To report the progress and status of the priority route projects to the ASEAN Maritime Transport Working Group (MTWG).

- For responsible port authorities, to develop and operate international RO-RO terminals.
- For responsible road administrations, to improve hinterland connection with the RO-RO terminals.
- For local governments and local business associations, to promote new business opportunities when using RO-RO shipping service.
- For competent RO-RO shipping operators, to prepare RO-RO shipping service based on their own marketing surveys and viable business plans including vessel procurement.

Finally, it is recommended that the ASEAN Connectivity Coordination Committee (ACCC), the Senior Transport Officials Meeting (STOM) and the ASEAN MTWG take on the important task of periodic monitoring of the ASEAN RO-RO shipping project at their respective levels in order that the envisaged RO-RO routes and services are operationalized, at least by 2015.

ANNEX 1 INSTITUTIONAL FRAMEWORK MONITORING MATRICES

Table A Institutional Framework Monitoring Matrix for the Priority Routes' Connecting Countries

Country	Indonesia		Malaysia		Philippines		Thailand	
Institutional Framework	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**
Customs treatment of RORO vehicles	Vehicle considered an import, to be levied taxes and duties. Alternatively, a guarantee bond would be made, vehicle is bonded material	Tax-Free and bond-free entry of vehicles Same treatment as in Brunei Darussalam and East Malaysia highway borders	A relaxed policy on entry of vehicles coming from Indonesia and Thailand as per experience	Same treatment as vehicles crossing Thai and Kalimantan highway borders	Vehicle considered an import, to be levied taxes and duties. Alternatively, a guarantee bond would be made.	Tax-Free and bond-free entry of ASEAN RORO vehicles	Vehicle considered an import, to be levied taxes and duties. Alternatively, a guarantee bond would be made.	Tax-Free and bond-free entry of ASEAN RORO vehicles Same treatment as vehicles crossing Malaysian highway border
Vehicle Insurance	Liability coverage only in Indonesia Might need to procure insurance at the border port	Optional expansion of coverage of insurance liability including another country or countries	Liability coverage only in Malaysia Might need to procure insurance at the border port	Optional expansion of coverage of insurance liability including another country or countries	Liability coverage only in the Philippines Might need to procure insurance at the border port	Optional expansion of coverage of insurance liability including another country or countries	Liability coverage only in Thailand Might need to procure insurance at the border port	Optional expansion of coverage of insurance liability including another country or countries
LHD vs RHD	Not an issue with Malaysia and Thailand Special exemption for LHD vehicles from the Philippines	Not an issue with Malaysia and Thailand Could start with containers or containers on chassis only. Exemption for LHD vehicles within North Sulawesi	Not an issue with Indonesia and Thailand. No RORO link with the Philippines	Not an issue with Indonesia and Thailand.	Would need special exemption for RHD vehicles using ASEAN RO-RO Network	Could start with containers or containers on chassis only. Exemption for RHD vehicles within Southern Mindanao	Not an issue with Indonesia and Malaysia. No RORO link with the Philippines	Not an issue with Indonesia and Malaysia.

Country	Indonesia		Malaysia		Philippines		Thailand	
Institutional Framework	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**
Other Vehicle Issues			West Malaysia has strict policy on vehicle age and vehicle's window tint	Same treatment as vehicles crossing Kalimantan highway border. Apply mutual recognition of vehicle inspection and registration				
Driver's License	Information in Bahasa Indonesia, using Roman characters Might not need translation in Malaysia Would need English translation in the Philippines and Thailand	Information in Bahasa Indonesia, using Roman characters Might not need translation in Malaysia A template license with English translation of information for the Philippines and Thailand	Information in Bahasa Malaysia, using Roman characters Might not need translation in Indonesia Would need English translation in Thailand	Information in Bahasa Malaysia, using Roman characters Might not need translation in Indonesia A template license with English translation of information for Thailand	Information in English, using Roman characters, already compliant with mutual recognition of driver's license	Information in English, using Roman characters	Information in Thai, using Thai characters Would need English translation in Indonesia and Malaysia	Information in Thai, using Thai characters A template license with English translation of information Personal information in Roman characters

Table B Institutional Framework Monitoring Matrix for Other International RO-RO Shipping Experienced Countries

Country	Brunei Darussalam		Singapore	
Institutional Framework	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**
Customs treatment of RORO vehicles	Temporary admission of foreign road vehicles for an initial period of three months is allowed. However, security, in the form of bank guarantee, general bond or cash, is required. Road vehicles from Sabah and Sarawak are exempted from many customs requirements, including import duty payment and customs guarantee. A limited number of buses and coaches from Malaysia and Indonesia are allowed to enter Brunei Darussalam on a daily basis without the need to pay any import duty or security.	Tax-Free and bond-free entry of vehicles Road vehicles from other ASEAN countries to be accorded the same treatment as to vehicles from Sabah and Sarawak.	Singapore allows temporary admission road vehicles to its territory. No customs duty is imposed on the vehicle and no customs guarantee is required. Tax is payable only if the vehicle is sold, disposed of or transferred locally.	This is already the ideal situation.
Vehicle Insurance	Malaysia's third party car insurance is recognized. Others are required to purchase Brunei Darussalam's third party car insurance before entering the country.	Optional expansion of coverage of insurance liability including another country or countries	All foreign-registered vehicles (except Malaysia-registered) must buy mandatory insurance coverage at the immigration checkpoint in Singapore.	Optional expansion of coverage of insurance liability including another country or countries
LHD vs RHD	LHD vehicles are not allowed in Brunei, except for diplomats' vehicles.	Temporary usage by tourist of LHD vehicles.	LHD vehicles cannot be imported for personal local registration, but temporary usage by tourists of LHD vehicles is allowed.	Temporary usage by tourist of LHD vehicles.
Driver's License	Information in English, using Roman characters, already compliant with mutual recognition of driver's license	Information in English, using Roman characters	Information in English, using Roman characters, already compliant with mutual recognition of driver's license	Information in English, using Roman characters

Table C Institutional Framework Monitoring Matrix for CLMV Countries

Country	Cambodia		Lao PDR*		Myanmar		Vietnam	
Institutional Framework	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**
Customs treatment of RORO vehicles	Cambodia allows temporary admission of road vehicles free of import duty or tax up to 12 months but subject to re-exportation.	This is already the ideal situation.	Lao PDR allows temporary admission of road vehicles for a period of two years, upon payment of a security of 120% of customs duty and other fee payable, in the form of cash or bank guarantee.	Tax-Free and bond-free entry of ASEAN RORO vehicles	Myanmar allows for temporary admission of foreign road vehicles. No customs bond or security is imposed on the vehicles.	This is already the ideal situation.	Vietnam has very strict rules on entry of foreign vehicles.	Tax-Free and bond-free entry of ASEAN RORO vehicles
Vehicle Insurance	Insurance required to operate a motor vehicle. TPL insurance may be purchased at the designated border check points.	Optional expansion of coverage of insurance liability including another country or countries	TPL insurance may be purchased at the designated border check points in Lao PDR	Optional expansion of coverage of insurance liability including another country or countries	Foreign vehicles must purchase third party liability insurance upon arriving at Myanmar's border crossings.	Optional expansion of coverage of insurance liability including another country or countries.	Insurance required to operate a motor vehicle. TPL insurance may be purchased at the designated border check points.	Optional expansion of coverage of insurance liability including another country or countries
LHD vs RHD	RHD/LHD vehicles are allowed in the designated routes (ASEAN and GMS)	No problem.	Has a cross border arrangement with Thailand. RHD vehicles allowed in some roads	Expand coverage to other ASEAN RHD countries	Both LHD and RHD vehicles are allowed in Myanmar roads, but must drive on the right.	No problem.	RHD vehicles are not allowed in Vietnam, except for diplomats' vehicles.	Temporary usage by tourist of RHD vehicles.

Country	Cambodia		Lao PDR*		Myanmar		Vietnam	
Institutional Framework	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**	**Current Situation**	**Interim Goal**
Driver's License	Cambodian driver's license is written in both Khmer and English.	No problem	Lao driver's license is in Lao script. Would need English translation for other ASEAN countries	Info on Lao driver's license in both English and Lao script.	Myanmar recognizes the domestic driving license of other ASEAN Member States. Myanmar driver's license is in Myanmar script.	Info on Myanmar driver's license in both English and Myanmar script.	Vietnamese driver's license has information in both English and Vietnamese. ASEAN licenses are recognized.	No problem
* Lao PDR is a land-locked country, therefore there are no concerns on RORO shipping service. There are various agreements with neighboring countries re border crossings.								

ANNEX 2

A Template for

MEMORANDUM OF UNDERSTANDING BETWEEN [AND AMONG] THE GOVERNMENTS OF [COUNTRY A], AND [COUNTRY B], [AND COUNTRY C] ON THE ROLL-ON/ROLL-OFF SHIPPING SERVICE BETWEEN [AREA A] AND [AREA B] [AND AREA C]

The Governments of [COUNTRY A] and [COUNTRY B], [and COUNTRY C], hereinafter referred to individually as the Participating Party, and collectively as the Participating Parties, being members of the Association of Southeast Asian Nations (ASEAN);

RECALLING the goal of the Master Plan on ASEAN Connectivity, adopted at the 17th ASEAN Summit on 28 October 2010, is to connect ASEAN through enhanced physical infrastructure development (physical connectivity), effective institutional arrangements (institutional connectivity) and empowered people (people-to-people connectivity);

RECALLING also the strategy of the Master Plan on ASEAN Connectivity is to establish efficient and reliable shipping routes connecting mainland and archipelagic Southeast Asia through, among others, the development of roll-on/roll-off (RO-RO) shipping services;

ADHERING to the [Indonesia-Malaysia-Thailand – Growth Triangle (IMT-GT) / Brunei Darussalam – Indonesia – Malaysia – The Philippines - East Asia Growth Area (BIMP - EAGA)] Implementation Blueprint 2012-2016 adopted at the [Sixth IMT-GT Summit on 04 April 2012 / Eighth BIMP-EAGA Summit on 04 April 2012], which gives priority to development of RORO shipping services in the [Dumai (Indonesia) – Malacca (Malaysia) Economic / Greater Sulu Sulawesi] Corridor;

RECOGNIZING that the establishment of RORO shipping services will greatly enhance trade and people movement between [AREA A] and [AREA B] [and AREA C];

HAVE AGREED AS FOLLOWS:

1. Objective

The objective of this Memorandum of Understanding is to facilitate the establishment and sustainable operation of RO-RO shipping between [PORT A] in [AREA A], [COUNTRY A] and [PORT B] in [AREA B], [COUNTRY B], [and PORT C in AREA C, COUNTRY C] (hereinafter referred to as the Designated Ports).

2. Licensed Operator and Vessel

Any vessel operator duly registered in [COUNTRY A] or in [COUNTRY B] [or in COUNTRY C] (hereinafter referred to as the RORO Operator) may provide the RORO service using any number of vessels.

3. Obligation of RORO Ferry Operator

3.1 Compliance with Operational, Technical, Safety and Security Standards

The RORO Ferry Operator shall take all measures to ensure that the RORO shipping services provided are regular and in compliance with the operational, technical, safety and security standards in force in the Participating Parties.

3.2 Frequency of Service and Sailing Schedule

3.2.1 The RORO Ferry Operator shall plan for the appropriate level of service, in terms of service frequency and sailing schedules, to encourage movement of goods and persons, and shall duly notify the relevant authorities in the Participating Parties before the start of the service.

3.2.2 Should there be changes to the sailing schedule, the RORO Ferry Operator shall notify the relevant authorities in the Participating Parties of such a change at least one week in advance.

3.3 Operation Cost

As far as practicable, the RORO Ferry Operator shall bear all costs incurred from its RORO ferry operation.

3.4 Insurance

The RORO Ferry Operator shall provide sufficient insurance coverage for the passengers on board its vessel for the purpose of meeting any compensation or claims that may arise from its ferry service.

3.5 Representative Offices

The RORO Ferry Operator shall establish a representative office or appoint an agent in the other Participating Party for the purpose of facilitating its business and traffic operations. The number of expatriates of the total staff force of the representative office shall be in accordance with the national laws of the said Participating Party.

4. Port Facilities and Services

The Participating Parties shall, from time to time, upgrade port facilities and services especially passenger, vehicle and cargo handling capability and capacity at their respective Designated Port, as well as other ancillary port services.

5. Marine Charges and Terminal Tariff

To promote sustainability of the RORO shipping operation, the Participating Parties shall provide concessionary rates (e.g., BIMP-EAGA rates) on marine charges and terminal tariff to the RORO ferry operator.

6. Custom, Immigration and Quarantine (CIQ) Formalities

6.1 The Participating Parties shall simplify, streamline and harmonize customs procedures, as well as sanitary and phytosanitary measures, at their respective Designated Port.

6.2 The Participating Parties shall coordinate the hours of operation of the CIQ authorities at the Designated Ports to ensure smooth operation of the RORO ferry service.

6.3 Passengers and transport crew on-board the RORO ferry vessel shall possess a valid passport or international travel document in lieu of the passport.

6.4 The Participating Parties shall exempt each other's citizens holding valid national passports from visa requirement in accordance with the ASEAN Framework Agreement on Visa Exemption signed on 25 July 2006.

7. Safety, Security and Environmental Protection Standards

The Participating Parties shall jointly undertake measures to ensure the RORO ferry operation meets the safety, security and environmental protection standards set by the International Maritime Organization, and relevant regional agreements.

8. Transport Pricing

The transport price shall be best determined by market forces**.** The Participating Parties shall ensure that the RORO Ferry Operator refrains from any measure or practice that tends to distort free and fair competition.

9. Temporary Admission of Road Vehicles

The Participating Parties shall grant temporary admission to road vehicles (and the fuel contained in its supply tanks, its lubricants, maintenance supplies, and spare parts in reasonable quantities) registered in the territory of the other Participating Party, without payment of import duties and import taxes, without depositing a Customs' guarantee bond and free of import prohibitions and restrictions, subject to re-exportation and other related conditions in accordance with the ASEAN Framework Agreement on the Facilitation of Inter-State Transport (AFAFIST) signed on 10 December 2009.

10. Types of Road Vehicle

Road vehicles on-board the RORO ferry may include:

- Bicycles
- Motor-cycles
- Private and government cars, multi-purpose vehicles (MPVs), vans;
- Commercial tourist buses; and
- Commercial freight vehicles as specified in Protocol 3 of the ASEAN Framework Agreement on the Facilitation of the Goods in Transit (AFAGIT), which entered into force on 19 April 2010.

11. Entry Permit for Commercial Tourist Buses and Freight Vehicles

11.1 Commercial tourist buses and commercial freight vehicles from a Participating Party travelling to the territory of the other Participating Party shall be required to secure a vehicle permit from the Government of the other Participating Party.

11.2 Such permit should be valid for 12 months.

11.3 The number of permits issued shall be determined by market forces for transport services.

11.4 Private and government vehicles are exempted from such permit requirement.

12. Identification Marks, Certificate of Registration and Registration Plate

12.1 Road vehicles in cross-border traffic shall be registered in their home country (i.e., the country of registration). They shall bear identification marks (trademark of manufacturer, chassis and engine serial number), carry a valid certificate of registration issued by the government agency responsible for regulating transport-related activities of their home country and display their registration number on a plate in the rear and the front.

12.2 The Participating Parties shall mutually recognize the vehicle registration certificate and registration plate.

13. Technical Conditions of Road Vehicles

Road vehicles from a Participating Party must comply with the technical standards on weights, axle loads and dimensions in force in the other Participating Party.

14. Technical Inspection Certificates

14.1 Road vehicles travelling to the territory of the other Participating Party shall be road worthy. The Participating Parties shall be responsible for the supervision of the roadworthiness of their respective road vehicles.

14.2 The Participating Parties shall mutually recognize each other's technical inspection certificate of goods vehicles and public services vehicles in accordance with the Agreement on the Recognition of Commercial Vehicle Inspection Certificates for Goods Vehicles and Public Services Vehicles Issued by ASEAN Member Countries signed at Singapore on 10 September 1998.

15. Driving Licenses

The Participating Parties shall mutually recognize each other's driving licenses in accordance with the Agreement on the Recognition of Domestic Driving Licenses issued by ASEAN Countries signed at Kuala Lumpur in Malaysia on 9 July 1985.

16. Road Safety Standards

Road vehicles from a Participating Party must comply with the road safety standards in force under the laws of the other Participating Party.

17. Compulsory Third-Party Motor Vehicle Liability Insurance

To be adequately insured against death or bodily injuries and/or property damages arising from road traffic accidents in the territories of the other Participating Party, road vehicles from a Participating Party travelling to the territory of the other Participating Party shall comply with the compulsory third-party motor vehicle liability insurance required thereat.

18. Safety and Security

The Participating Parties shall ensure the safety and security of travellers, goods and vehicles through coordination and cooperation among the authorities concerned and to render all necessary assistance in the event of accidents, casualties or deaths.

19. Access Roads to the Designated Ports

To allow for freer movement of road vehicles, the Participating Parties shall designate the access road to their respective Designated Port as part of the ASEAN Transit Transport Routes under Protocol 1 of the ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT) signed on 16 December 1998.

20. Consultations

In the ASEAN spirit of solidarity and cooperation, the Participating Parties shall consult each other from time to time in ensuring the full implementation of this Memorandum of Understanding.

21. Review and Amendment

21.1 This Memorandum of Understanding may be revised, modified or amended by the Participating Parties as and when needed to ensure its effective implementation.

21.2 A Participating Party may request in writing any revision, modification or amendment of all or any part of this Memorandum of Understanding. Such revision, modification or amendment shall be mutually agreed upon in written form by the other Participating Party, and shall form an integral part of this Memorandum of Understanding. Such revision, modification or amendment shall enter into force on such date as may be agreed upon in writing by all the Participating Parties. Any revision, modification or amendment shall not prejudice the rights and obligations arising from or based on this Memorandum of Understanding before or up to the date of such revision, modification or amendment.

22. Settlement of Disputes

Any disputes or differences arising out of the interpretation or implementation or application of the provisions of this Memorandum of Understanding shall be settled amicably through consultation or negotiation between the Participating Parties.

23. Entry into Force and Duration

This Memorandum of Understanding shall enter into force on the date of its (signing) ratification and shall remain in force until terminated.

24. Termination

Any Participating Party may terminate this Memorandum of Understanding by written notification to the other Participating Party at least six (6) months prior to such termination.

IN WITNESS WHEREOF, the undersigned, being duly authorized to sign by their respective Government, have signed this Memorandum of Understanding.

Done at [XXXX] in [XXXXX] on [XX in 201X].

For the Government of [COUNTRY A]

.....
Minister [or Senior Officials] for Transportation

For the Government of [COUNTRY B]

.....
Minister [or Senior Officials] of Transport

For the Government of [COUNTRY C]

.....
Minister [or Senior Officials] of Transport