No.

DIRECTORATE GENERAL OF HIGHWAYS
MINISTRY OF PUBLIC WORKS
REPUBLIC OF INDONESIA

SPECIAL ASSISTANCE FOR PROJECT IMPLEMENTATION FOR THE TANJUNG PRIOK ACCESS ROAD PROJECT IN THE REPUBLIC OF INDONESIA

FINAL REPORT SUMMARY

NOVEMBER 2010

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.
YACHIYO ENGINEERING CO., LTD.

EID
CR(3)
10-189

DIRECTORATE GENERAL OF HIGHWAYS
MINISTRY OF PUBLIC WORKS
REPUBLIC OF INDONESIA

SPECIAL ASSISTANCE FOR PROJECT IMPLEMENTATION FOR THE TANJUNG PRIOK ACCESS ROAD PROJECT IN THE REPUBLIC OF INDONESIA

FINAL REPORT
SUMMARY

NOVEMBER 2010

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.
YACHIYO ENGINEERING CO., LTD.

CURRENCY EXCHANGE RATE

Following currency exchange rates were adopted in this report unless otherwise stipulated.

(1) Indonesia Rupiah vs. US Dollar

USD 1= IDR 9,017

(2) Indonesia Rupiah vs. Japanese Yen

JPY 1 = IDR 99.01

N

STUDY AREA TgPA (W-1, W-2) DIRECT RAMP

TgPA (E-1, E-2, E-2A, NS-LINK)

EXISTING TOLL ROAD

PLANNED TOLL ROAD

TgPA ON RAMP

TgPA OFF RAMP

PROPOSED PASOSO FLYOVER

Laut Jawa

Java Sea

TANJUNG PRIOK INTERNATIONAL PORT

CONTAINER TERMINAL

TANJUNG PRIOK

CILINCING

W-1 (STUDY AREA)

W-2 (STUDY AREA)

PROPOSED PASOSO FLYOVER

PROPOSED RAILWAY EXTENSION

E-2A

E-2

NS-LINK

E-1

DIRECT RAMP (STUDY AREA)

HARBOUR TOLL ROAD

SUNTER

JAKARTA INTRA URBAN TOLL ROAD (JIUT)

JAKARTA-CIKAMPEK-CILINCING TOLL

TO CIKUNIR

PHOTO ①

PHOTO ②

PHOTO ③

PHOTO ④

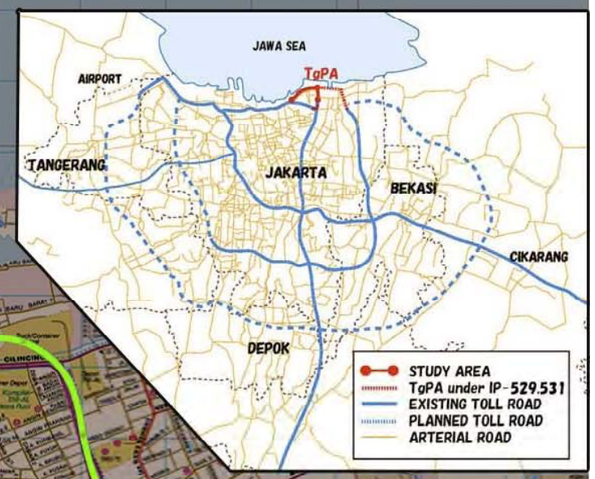
PHOTO ⑤

PHOTO ⑥

PHOTO ⑦

PHOTO ⑧

PHOTO ⑨



PHOTO⑨ Perspective View of the proposed Cable Stayed Bridge in W-2

PHOTO⑦ Container Yard under the proposed alignment of W-1

PHOTO⑧ Perspective View of W-1, W-2

PHOTO⑥ Port Inner Road under the proposed alignment of W-1

PHOTO⑤ 3-D Mockup of Direct Ramp

PHOTO④ Perspective Veiw of Jampea JCT (boundary of E-2A and W-1)

PHOTO② Perspective View of Section E-2

PHOTO③ Proposed Connection Point of Direct Ramp with Harbour Toll Road

PHOTO① Section E-1 under construction

SYNOPSIS

1. Country	Republic of Indonesia
2. Name of Study	Special Assistance for Project Implementation for the Tanjung Priok Access Road Project
3. Counterpart Agency	Directorate General of Highways (Bina Marga), Ministry of Public Works
4. Objectives of Study	(1) To review and examine the traffic demand forecast for the future years, reflecting the results of the traffic survey conducted, (2) To review and examine the cost estimate for W-1, W-2 and Direct Ramp , (3) To develop and compare alternative project scopes for the completion of the TgPA network, (4) To study the applicability of the Public Private Partnership (PPP) to the operation and maintenance (O&M) of TgPA, (5) To examine the necessity for additional procedures, if any, for social and environmental considerations and their extent, and (6) To recommend an optimal project implementation scheme, based on the traffic demand, project cost and project effects.
5. Study Area	Jakarta Metropolitan Area

6. Scope of Study

(1) Re-confirm the present traffic volumes and develop alternatives to the project scope,
(2) Develop project implementation plans,
(3) Review and prepare for the social and environmental considerations,
(4) Calculate the project effects, and
(5) Propose an optimal alternative.

7. Major Findings

It was decided, for the first time, that Direct Ramp is considered as a component of TgPA Phase 2 of the Japanese ODA loan, subject to the approval of JICA..

Based on some revisions made for the model components and actual traffic survey, the future traffic demand on the network was reviewed and updated. The results verified that a network enabling more route options is naturally more desirable in terms of the traffic volumes assigned over the network. Thus, construction of W-1 and W-2 as well as addition of Direct Ramp is justified from the aspect of network flow.

As a result of the review of the road design, it was found out that several alternative designs will reduce the construction cost by Rp.142 billion in total.

The review provided the construction costs for W-1, W-2, and Direct Ramp sections as Rp 1,475 billion, Rp 1,087 billion, and Rp 200 billion, respectively.

The area of land to be acquired for the new TgPA Project is 32,898 ㎡ in total, comprising of 4,334 ㎡, 24,606 ㎡, and 3,958 ㎡ for W-1, W-2, and Direct Ramp, respectively.

In accordance with the EIA approval procedure, Bina Marga must inform MOE of the change of the scope of the project after the EIA of 2004, namely the addition of the Direct Ramp, by submitting the revised EIA documents.

The alternative project scopes to be considered are Case 1 (W-1 and W-2 only), Case 2 (Direct Ramp only), and Case 3 (W-1, W-2, and Direct Ramp). The construction costs are JPY 25.9 billion, JPY 2.0 billion, and JPY 27.9 billion for Cases 1, 2, and 3, respectively.

As a result of overall evaluation, Case 3 was selected as the best alternative. As the amount of the Japanese ODA loan requested by GOI is limited to JPY 10 Billion (US$ 120 Million), the total project is divided into three phases such as Phase 3 for the partial section on W-2 in length of 2.1 km to be funded by TgPA Phase 3 of the Japanese ODA loan, Phase 4 for the partial section on W-1 and W-2 in length of 3.5 km by unidentified sources, and Direct Ramp by TgPA Phase 2 of the Japanese ODA loan.

Applicability of the PPP scheme to O&M was examined, setting up options such as the long-term O&M contract, full monetization, and hybrid.

The supposed implementation schedule is such that, after the loan agreement is signed in March 2011, the construction will start in June 2013 and be completed in August 2015. Direct Ramp will be opened to traffic in February 2014, while Phase 3 in September 2015.

8. Conclusions and Recommendations

The overall evaluation of the cost, traffic volumes, economic impacts, etc., resulted in Phase 3 to be implemented as a Japanese ODA loan project. The project cost and the loan amount turned out to be JPY 13,277 million and JPY 10,468 million, respectively.

Special Assistance for Project Implementation for The Tanjung Priok Access Road Project

Summary of Final Report

Table of Contents

List of Table

List of Figure

List of Abbreviations

AMDAL	EIS, Environmental Impact Statement
ANDAL En	vironmental Impact Assessment Report
BOT B	uild Operate Transfer
BPJP	National Long-term Development Plan
BPJT Hi	ghway Controller Agency
BPKP	Finances Monetary Agency and Development
CMNP	Citra Marga Nusaphala Persada Company
D/D De	tailed Design
DGH	Directorate General of Highways
DKI	Special Capital City District
DSCR	Debt Service Cover Ratio
EIA E	nvironmental Impact Assessment
EIRR	Economic Internal Ratio of Return
ETC El	ectronic Toll Collection
F/C For	eign Currency
FIRR F	inancial Internal Ratio of Return
F/S Fe	asibility Study
GDP	Gross Domestic Product (of the nation)
GOI G	overnment of Indonesia
GRDP	Gross Regional Domestic Product (of the region)
IC I	nterchange
ICB I	nternational Competitive Bidding
IDR I	ndonesian Rupiah
IMF In	ternational Monetary Fund
IRR	Internal Rate of Return
ITS I	ntelligent Transportation System
JCT J	unction
JETRO	Japan External Trade Organization
JIUT J	akarta Intra Urban Toll Road
JLB	West 1 Jakarta Outer Company
JLJ	Jakarta Outer Ring Road Company
JOORR	Jakarta Outer Outer Ring Road
JORR	Jakarta Outer Ring Road
KAI I	ndonesia Railway Company

KBN N	usantara Bonded Zone
L/A Loan	Agreement
L/C	Letter of Credit
LLCR Loa	n Life Coverage Ratio
MOE Mi	nistry of Environment
MOPW Mi	nistry of Public Works
MOT M	inistry of Transport
NPV N	et Present Value
NS-Link N	orth to South Link
O&M O	peration and Maintenance
OD O	rigin-Destination
ODA Of	ficial Development Assistance
PC P	re-stressed Concrete
PCU Pa	ssenger Car Unit
PPJM	National Mid-term Development Plans composing BPJP
PPP Publ	ic Private Partnership
PSUD	Center for Urban Design Studies
PQ P	requalification
RKL Env	ironmental management Plan
RPL	Environmental Monitoring Plan
RTRW	Regional Spatial Plans at Provincial and Municipal Level
RTRWN	Regional Spatial Plan at National Level
SAPI Speci	al Assistance for Project Implementation
SEZ	Special Economic Zone
SISTRANAS Na	tional Transport System Plan
SITRAMP	Study on Integrated Transportation Master Plan for Jabodetabek
SPC	Special Purpose Company
SPPL	Statement Letter of Readiness of Environmental Management and Monitoring
SP2LP	Determing Letter of Project Location Development
STEP	Special Terms for Economic Partnership
TEU	Twenty-Foot Equivalent unit
TgPA	Tanjung Priok Access Road
TNI-AL I	ndonesian Navy
TOR	Term of Reference
TSS	Traffic Surveillance System
UKL E	nvironmental Management Efforts
UPL	Environmental Monitoring Efforts

CHAPTER 1 INTRODUCTION

1.1 Backgrounds of the Survey

In Indonesia, efforts are being made to expand the road infrastructure as well as to raise the efficiency of whole transportation system, in order to cope with serious traffic congestion on the road network. In Jakarta Metropolitan Area, particularly in Tanjung Priok Port Area, two Japanese ODA loans were provided in 2005 and 2006 to improve the road network by construction of the Tanjung Priok Port Access Road (hereinafter TgPA), which has a total length of 12.1 km.

However, based on the detailed engineering design under the loans, it was found out that said two loans would not be able to cover the required amount of funds for completion of the planned network due to the recent price hike of construction materials. Thus, in response to the request of GOI, JICA decided to conduct a supplementary survey entitled the Special Assistance for Project Implementation for the Tanjung Priok Access Road Project (the Survey) to examine the optimal size and formation of the network if assisted by an additional Japanese ODA loan.

1.2 Objectives of the Survey

According to the Terms of Reference (TOR), JICA specified the scope of work for the Survey as follows;

(1) Re-confirm the present traffic volumes and develop alternatives to the project scope,

(2) Develop project implementation plans,

(3) Review and prepare for the social and environmental considerations,

(4) Calculate the project effects, and

(5) Propose an optimal alternative.

CHAPTER 2 OVERVIEW OF THE TGPA PROJECT

2.1 Backgrounds of TgPA Project

GOI shows the basic national policy and strategy for infrastructure, including the transport sector, in the National Long-term Development Plan (BPJP). Correspondingly, regional spatial plans at the national (RTRWN), provincial and municipal (RTRW) levels are regularly formulated. Presently, BPJP 2005-2025 and RTRWN No.26, 2008 are in effect. Also, the National Mid-Term Development Plan (PPJM) is set up for every five years in such a way as PPJM-II (2010-2014).

As a supreme plan for the transport sector, the National Transport System Plan (SISTRANAS) 2005 by MOT aims for a regionally and modally harmonious nationwide transport system.

MOPW has a five-year program (RENSTRA 2010-2014) involving the vision, mission, and overall and sectoral targets for road development, along with the above PPJM-II (2010-2014). In 2006, it also formulated the National Toll Road Development Plan, which aims for the nationwide road development involving both toll and non-toll highways, as well as rehabilitation and O&M of arterial roads which support economic activities. The development of TgPA is positioned as an important part of the planned toll road network in the Jakarta Metropolitan Area (Jabodetabek) with a total length of 257.5 km.

2.2 Outlines of TgPA Project Area

Jabodetabek covers DKI Jakarta (Dearah Khusus Ibukota Jakarta), and its neighboring satellite cities with a population of 22 million, which increased 1.9 times more than that in 1980, and further outward expansion is anticipated. However, the rapid progress of motorization accelerated by rapid urbanization in the area causes constant traffic congestion over the arterial road network.

One of the major traffic origins/destinations in the area is the Tanjung Priok Port, which is the largest port in terms of both facility size and handling quantity of cargo in Indonesia. It is also the only port handling container cargo in West Java.

Urban expressways in Jabodetabek were initially planned in the 1970's as a toll road network, and have been constructed progressively utilizing ODA funds and BOT schemes. So far, the Jakarta Intra Urban Toll Road (JIUT), Harbor Road, most of the Jakarta Outer Ring Road (JORR), and North to South Link (NS-Link) have been completed. In the Study on Integrated

Transportation Master Plan for the Jakarta Metropolitan Area (SITRAMP) targeted for 2020, implemented by JICA during 2000 to 2004, a development plan for toll roads with a total length of 257.5 km has been proposed, including early completion of the remaining portion of JORR, early implementation of TgPA, and addition of the Jakarta Outer Ring Road II (JOORR), as shown in Figure 2.1.

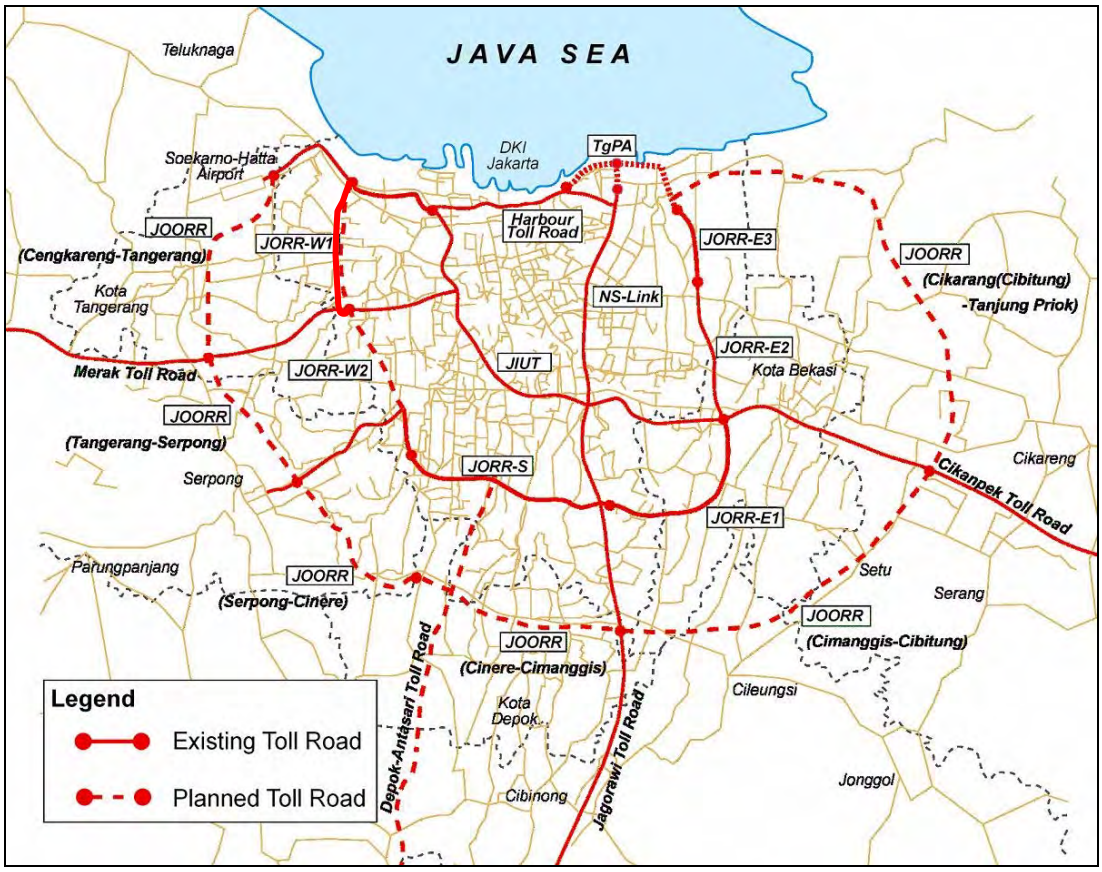


Figure 2.1 Toll Road Network Planned in Jakarta Metropolitan Area

2.3 Objectives of the TgPA Project

The objectives of the construction of the TgPA, which is a 12.1 km long, 6-lane toll road connecting the northeastern end point of JORR and Harbor Road, are as follows:

- To alleviate serious traffic congestion in the area near the Tanjung Priok Port and contribute to the sustainable social and economic urban activities;
- To supplement the radial toll roads including the airport access road;
- To raise the efficiency of freight movement to/from the port; and
- To promote upgrading of land use in the Jabodetabek.

2.4 Current Footsteps of the TgPA Project Implementation

(1) Feasibility Study

In January 2004, JETRO completed the F/S requested by GOI for the construction of TgPA, providing preliminary designs for the route selection, geometric alignment and road facilities, indicative cost estimates, implementation schedule plan and examination of project effects.

(2) Provision of Japanese ODA Loans

Based on the above F/S results, GOJ decided to offer ODA loans. In 2005 and 2006, two agreements were signed between JBIC (now JICA) and GOI to cover the fees for consulting services such as the detailed design (D/D) and construction supervision, facility construction and formation of ITS/TSS through the STEP scheme, amounting to JPY 52,926 million, as shown in Table 2.1.

Table 2.1 Summary of Japanese ODA Loan Agreements for TgPA

Phase		Phase 1	Phase 2
Loan I/P		IP-529	IP-531
Conclusion Date		31 March , 2005	29 March, 2006
Loan Period		28 July, 2012	26 June, 2013
Loan Amount (Mill. Yen)	Construction	22,055	22,420
	Design, Supervision	2,410	1,958
	Contingency	1,841	2,242
	Total	26,306	26,620

(3) Implementation of Detailed Design

The D/D for all sections namely, E-1, E-2, NS-Link, W-1, and W-2 was completed in December 2007 by the consultant procured for Phase 1.

As a result of the D/D, however, the total cost had increased 1.8 times of the original total loan amount for phases 1 and 2. There are several reasons pointed out for the cost increase, including

1) Significant price hike of construction materials around 2007 and 2008, 2) Application of the newest Indonesian design standards which amended the design live loads upward by 10 to 15 percent, 3) Inevitable adoption of larger scale bridge types with longer span lengths suitable to the actual land use, 4) Addition and extension of ramps reasonably needed for strengthened linkage with the port facilities, and 5) Inclusion of the cost for improvement of arterial road facilities necessary for the construction of TgPA.

(4) Repackaging of Construction

Bina Marga rearranged the implementation plan for the whole network and repackaged the construction sections from the original five sections in two phases to seven sections in three phases, as shown Table 2.2. In the repackaged plan, a new Phase 3 was created for W-1 and W-2, which was excluded from the scope under the current loans.

Table 2.2 Summary of Repackaging

Phase (Loan Amount)	Original		Re-packaging	
	Section	Amount (Mil. YEN)	Section	Amount (Mil. YEN)
Phase 1 (JPY26,306Mil)	E-1 (L=5.40km)	8,867	E-1 (L=3.40km)	6,989
	E-2 (L=2.65km)	8,948	E-2 (L=2.74km)	9,811
	Construction Cost	17,815	Construction Cost	16,800
	Escalation	4,240	Escalation	5,255
	Consaltant Services	2,410	Consaltant Services	2,410
	Contingency	1,841	Contingency	1,841
	Total	26,306	Total	26,306
Phase2 (JPY26,620Mil.)	W-1 (L=1.95km)	6,008	E-2A (L=1.92km)	11,100
	W-2 (L=1.70km)	5,790	NS-Link (L=2.24km)	4,709
	NS-Link (L=0.38km)	2,699	Direct Ramp (L=1.10km)	1,971
	TSS	6,006		
	Construction Cost	20,503	Construction Cost	17,780
	Escalation	1,917	Escalation	4,640
	Consaltant Services	1,958	Consaltant Services	1,958
	Contingency	2,242	Contingency	2,242
	Total	26,620	Total	26,620
Postponed Scope			W-1 (L=2.36km)	16,175
			W-2 (L=2.91km)	9,291
			TSS	8,929
			Total	34,395

In January 2010, in response to the request of Bina Marga for JICA's consent on the repackaged plan, JICA agreed on the commencement of tender for originally packaged E-2 and NS-Link.

However, the program for W-1 and W-2 has not been decided yet.

In the meantime, the Direct Ramp, which is intended to connect the planned NS-Link directly to the existing Harbor Road, was planned by Bina Marga, foreseeing the postponement of the completion of W-1 and W-2. In the above repackaged plan, it is supposed to be tentatively included in Phase 2.

(5) Construction Underway

Construction started in January 2009 only for E-1, and was completed in July 2010. The tender for construction of the newly packaged E-2, E-2A, and NS-Link is in progress.

CHAPTER 3 REVIEW OF TRAFFIC DEMAND FORECAST

3.1 Review of Existing Traffic Demand Forecast

3.1.1 Traffic Demand Forecast in the TgPA Project (Phase 1), 2007

Future traffic demand was forecasted based on the origin-destination (OD) table and network in the SITRAMP with some OD revision such as the 1) Tanjung Priok Port traffic volume and 2) KBN Marunda expansion plan.

3.1.2 Traffic Demand Forecast in the Direct Ramp Study, 2009

On the direct ramp study in 2009, the traffic demand forecast was implemented with road network updating as additional ramps for section NS-Link and the traffic data based on the additional count survey result.

In this study, three network case alternative was analyzed such as i) toll road network without direct ramps and TgPA West section, ii) with direct ramps but without west section, and iii) with direct ramps and west section.

3.1.3 Necessary Revision of OD Table and Road Traffic Network from the Past Traffic Demand Forecast

In this SAPI Survey, the basic situation of toll road traffic is not drastically changed. Then OD Table and network used in the past project is applied for this survey. However, the following revision was necessary to reflect the following situations:

- ✓ Updating of traffic database based on the result of traffic count survey near Tanjung Priok Port
- ✓ Updating of the traffic OD table and network modification based on development plan which is not reflected in 2007 and 2009 traffic demand forecast
- ✓ Updating the toll road network and tariff system in the Jabodetabek area

3.2 Supplementary Traffic Survey

The following were carried out as a part of this Survey to characterize the present and future traffic situations after the operation of TgPA:

- ✓ Traffic Count Survey near Tanjung Priok Port

- ✓ Car Users' Stated Preference Survey for Tanjung Priok Access Road
- ✓ Travel Time Survey

3.2.1 Traffic Count Survey near Tanjung Priok Port

To achieve the purpose, the survey was implemented at seven locations near the Tanjung Priok Port.

(1) Survey Result

Twenty four-hour traffic volume of each section is from approximately 75,400 vehicles to 142,000 vehicles for both directions. At the Tanjung Priok 2 Ramp (CO-7), the total traffic volume of on- and off-ramp is approximately 27,200 vehicles. In Jl. Cilincing (CO-3, CO-4), Jl. Cakung Cilincing (CO-5) and Jl. Sulawesi (CO-6), the traffic volume is comparatively larger than 90,000 vehicles. From the viewpoint of freight vehicle volume, CO-3, CO-4, CO-5 and CO-6 have a larger total traffic volume by 17,700 freight vehicles to 20,400.

Modal composition of passenger car ratio is approximately 43% at CO-1, CO-2 and CO-5, while 33% at CO-3 and CO-4, in spite of composition of CO-6 is higher than other points by approximately 60% and that of Tanjung Priok Ramp (CO-7) is 58.6%. From the viewpoint of trucks, the section of Sulawesi, Jampea, Cilincing has a large occupation of 45.2% to 46.9%. At Tanjung Priok Ramp, freight vehicle composition is 34.2%.

Large vehicle ratios of CO-3, CO-4 and CO-5 are comparatively higher by 36.6% to 37.2%, while those of CO-1 and CO-2 are lower by 19.4% to 24.1%.

Table 3.1 24 hour sectional Traffic Volume by each direction, each mode

			TOTAL			Modal Composition			
			Without Motorcycle(a)	With Motorcycle(b)	All Freight	Sedan(2+6)	Bus(3-5)	Trucks(7-11)	Large Vehicle Ratio (5, 9-11)/a
CO-1	W2	W-E	9,741	37,289	3,405	40.3%	21.4%	35.0%	23.2%
		E-W	12,163	38,147	3,961	43.9%	19.4%	32.6%	24.8%
		TOTAL	21,904	75,436	7,366	42.3%	20.3%	33.6%	24.1%
CO-2	W1	W-E	12,917	40,689	2,238	43.1%	42.7%	17.3%	18.3%
		E-W	13,293	46,810	2,438	45.1%	38.2%	18.3%	20.6%
		TOTAL	26,210	87,499	4,676	44.1%	40.4%	17.8%	19.4%
CO-3	E2-A	W-E	21,511	50,632	9,266	38.5%	13.6%	43.1%	36.0%
		E-W	17,804	48,946	8,496	28.4%	18.5%	47.7%	37.3%
		TOTAL	39,315	99,578	17,762	33.9%	15.8%	45.2%	36.6%
CO-4	E2	W-E	22,582	57,456	10,024	36.4%	16.8%	44.4%	34.7%
		E-W	21,016	55,070	10,422	29.8%	18.4%	49.6%	39.4%
		TOTAL	43,598	112,526	20,446	33.2%	17.6%	46.9%	37.0%
CO-5	E1	S-N	19,084	54,672	9,310	40.9%	5.2%	48.8%	39.9%
		N-S	20,570	54,819	8,766	46.8%	4.9%	42.6%	34.6%
		TOTAL	39,654	109,491	18,076	44.0%	5.1%	45.6%	37.2%
CO-6	NS	S-N	41,418	77,820	10,142	59.8%	11.8%	24.5%	19.4%
		N-S	36,320	64,225	9,043	59.7%	13.2%	24.9%	18.6%
		TOTAL	77,738	142,045	19,185	59.8%	12.5%	24.7%	19.0%
CO-7	Direct	Off ramp	10,710	10,712	4,678	48.9%	1.7%	43.7%	30.3%
		On ramp	16,475	16,475	4,612	64.9%	1.1%	28.0%	14.9%
		TOTAL	27,185	27,187	9,290	58.6%	1.3%	34.2%	21.0%

(2) Comparison with the past traffic surveys

A traffic volume survey was implemented in 2007 and 2009. The main characteristics of the results of these past surveys and that of the current data in 2010 are as follows:

- ✓ Traffic volumes of Jl. Jamper(CO-3), Jl. Cilincing (CO-4) and Jl. Sulawesi (CO-5) section and Tanjung Priok Ramp (CO-7) are increasing, while the traffic volume of Jl. Martadinata (CO-1, CO-2) and Cakung Cilincing (CO-6) are slightly decreasing, as compared with the past traffic volumes.

- ✓ The following situations are supposed to influence the traffic flow on Jl. Martadinata (CO-1, CO-2), Freight volume of gates 1 and 3 of Tanjung Priok Port, which are located in the western area, is falling down.

- ✓ The following background is supposed to influence the decrease of traffic flow trend of CO-5. The construction of TgPA E-1 section is proceeding. Many large freight vehicles which usually use Cakung Cilincing to enter Tanjung Priok area tend to divert to Kebong Cawang Barrier via JIUT.

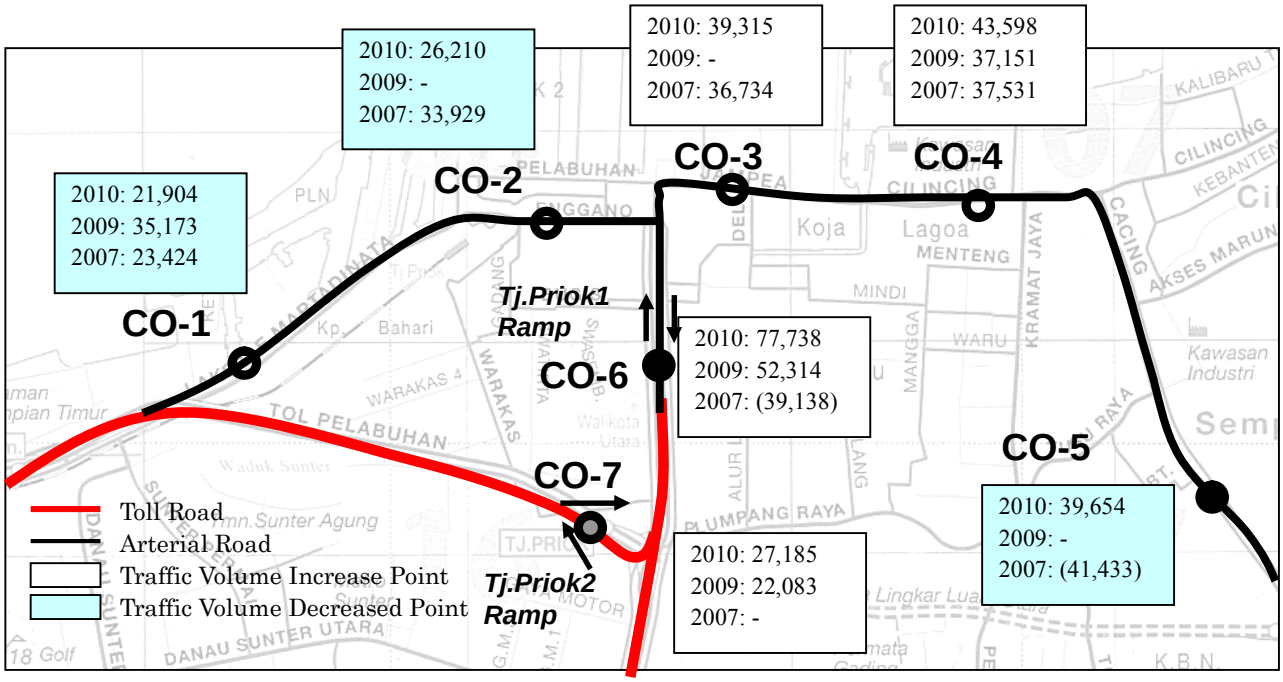


Figure 3.1 Traffic Volume Comparison of 2007, 2009, and 2010 (All w/o motorcycle)

3.2.2 Car Users' Stated Preference Survey for Tanjung Priok Access Road Usage

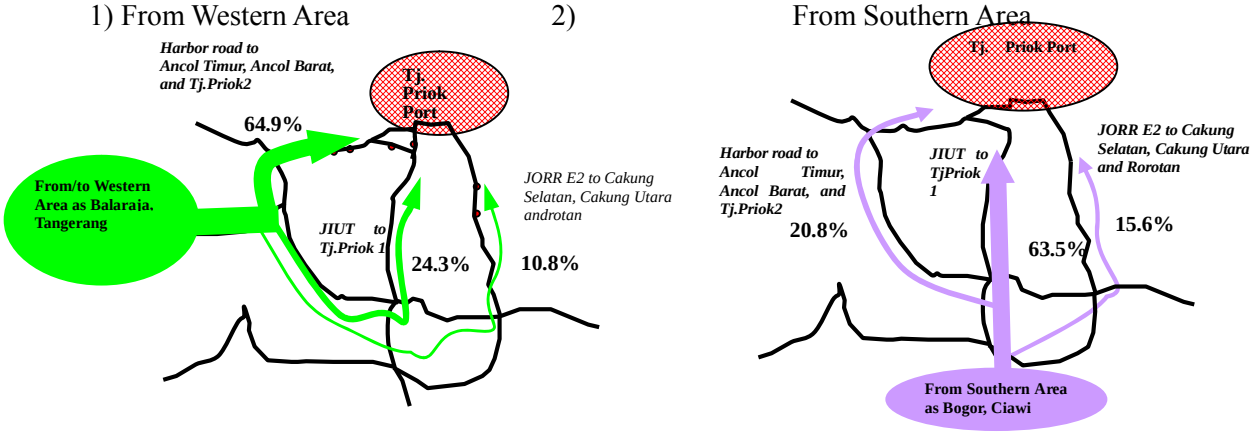
This survey was carried out by hearing method. Interview locations shown in Table 3.3 were decided from the viewpoint of freight transport quantity and trip characteristics. The surveyor interviewed on aspects such as i) trip information, ii) toll road usage and iii) TgPA stated preferences to the vehicle users. Total number of samples for eight survey points is 899.

(1) Present Toll Road Using Condition

Figure 3.9 shows the present toll road using the condition by origin's direction. The main characteristics of preferred route from each area are as follows:

- ✓ From the western area, vehicles which use Tanjung Priok 2 Ramp and Harbor Road occupy 64.9%;
- ✓ From the southern area, vehicles which use Tanjung Priok 1 Ramp via JIUT occupy 63.5%, while those which use JORR via Rorotan Ramp, Cakung Selatan and Cakung Utara occupy 15.6%.
- ✓ From the eastern area, JORR route users to Tanjung Priok Port occupy a majority of 75.3% in spite of the congestion at Jl. Cilincing.

1) From Western Area 2) From Southern Area



3) From Eastern Area

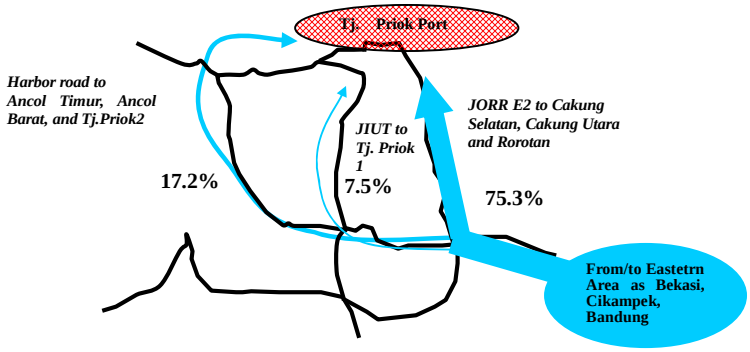


Figure 3.2 Ratio of toll road route to the Tanjung Priok Port and surrounding area

(2) Future Toll Road Usage Preference

The users' stated preference related to the TgPA W section is characterized as follows;

- ✓ It is forecasted that the traffic utilizing TgPA W section is mainly composed of those which uses the eastern area of Tanjung Priok Port from the western area of Jabodetabek.
- ✓ Majority of this traffic use Kampung Bahari ramp for access to their destination. The ratio of users selecting the nearer ramp for access to the facility, through payment of TgPA fare, is 25.9% of all western facility users and 47.5% of all eastern facility users.

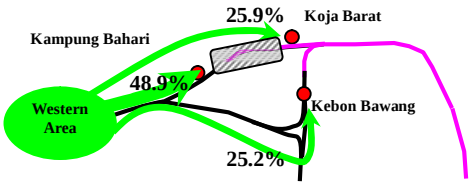
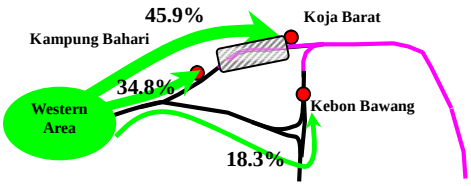
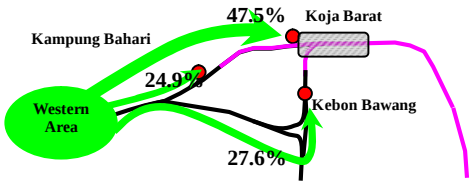
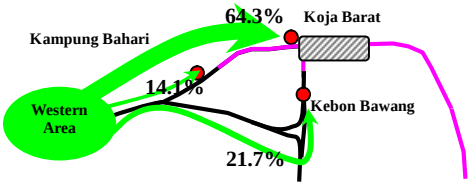
From /to	Case 1: JORR, TgPA rate is 7,000 Rp.	Case 2: JORR rate is 7,000 Rp. and T gPA rate is separately set as 4,000 Rp.
To western facility		
To eastern facility		

Figure 3.3 Future toll road user preference to eastern facility of Tanjung Priok Port and surrounding facility

2) Tendency of the traffic which pass through the city center area

One of the important roles of TgPA is to serve as bypass of JIUT in order to avoid the most congested section from Tomang JCT and Cawang JCT.

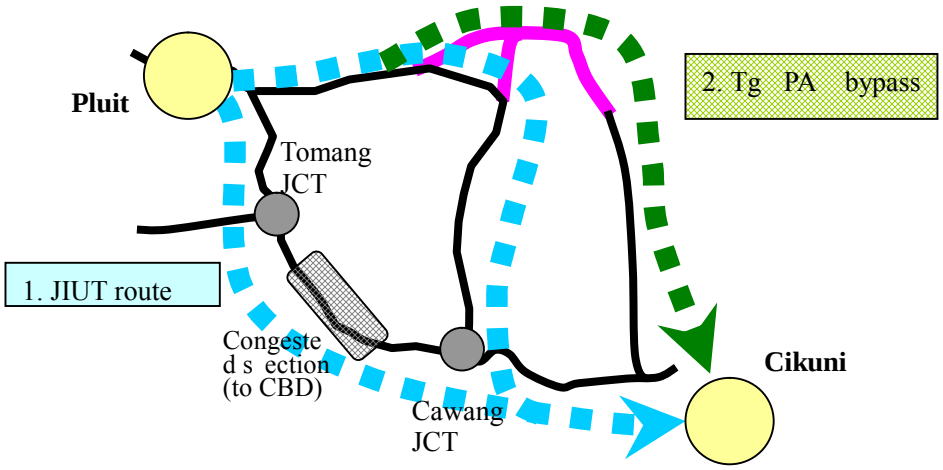


Table 3.2 Utilization rate of TgPA for through traffic in Jakarta Urban Area

Vehicle type	Utilized route	Case 0 (without TgPA)	Case 1 (TgPA rate =7,000 Rp)	Case 2 (TgPA rate = 4, 000 Rp/Separated from JORR as 7,000 Rp)
Fare from Pluit to Cikunir JCT(Rp)		8,000 (6,500+1,500)	13,500 (6,500+7,000)	17,500 (6,500+7,000+4,000)
All type	JIUT	100%	51.8%	54.5%
	TgPA	-	48.2%	45.5%
Passenger car	JIUT	100%	52.8%	52.8%
	TgPA	-	47.2%	47.2%
Trucks	JIUT	100%	51.5%	55.1%
	TgPA	-	48.5%	44.9%

The main characteristics of the route selection for pass-through traffic are as follows:

- ✓ The ratio of car users which select JIUT is almost equal to those selecting TgPA which is 51.8% and 48.2%, respectively. In case 2, the ratio of users which select to use TgPA decreases by only 2.7 % though the fare rate via TgPA rises from Rp. 13,500 to Rp. 17,500. In spite of the traffic volume from Pluit to Cikunir, and those far from eastern section being comparatively small among the whole toll road traffic in Jakarta, it is observed that there seems to be a need for the bypass to access TgPA.

- ✓ From the viewpoint of traffic mode, freight vehicles are tending to change the route by fare system.

3.2.3 Travel Time Survey

The surveyors measured the travel time from Tanjung Priok Port to the suburban city via toll road by the morning peak and midday non-peak time, per direction.

1) Average travel time by route

The average travel time of morning peak inbound is the longest among both directions and both time modes. Travel speed is comparatively slow especially in the sections between JORR to JIUT (route 3, 4) and arterial road near Tanjung Priok Port (from Rolotan toll road barrier, JORR E1 section to JICT)

2) Travel time and speed comparison according to time zone

Comparing morning peak and non-peak inbound direction, travel time of the former is 62 min, which is 1.72 times longer than the latter on route 1 from Cakung to Tanjung Priok Port. On routes 2, 3, and 4, the travel times during the morning peak are only 1.19 times and 1.27 times larger.

3) Travel time and speed comparison of inbound and outbound traffic

Comparing travel time of inbound and outbound traffic, travel time of route 1 and 3 of morning inbound is respectively larger by 1.7 to 1.87 times than that of morning outbound, while that of route 2 and 4 is 1.2 to 1.21 times, respectively.

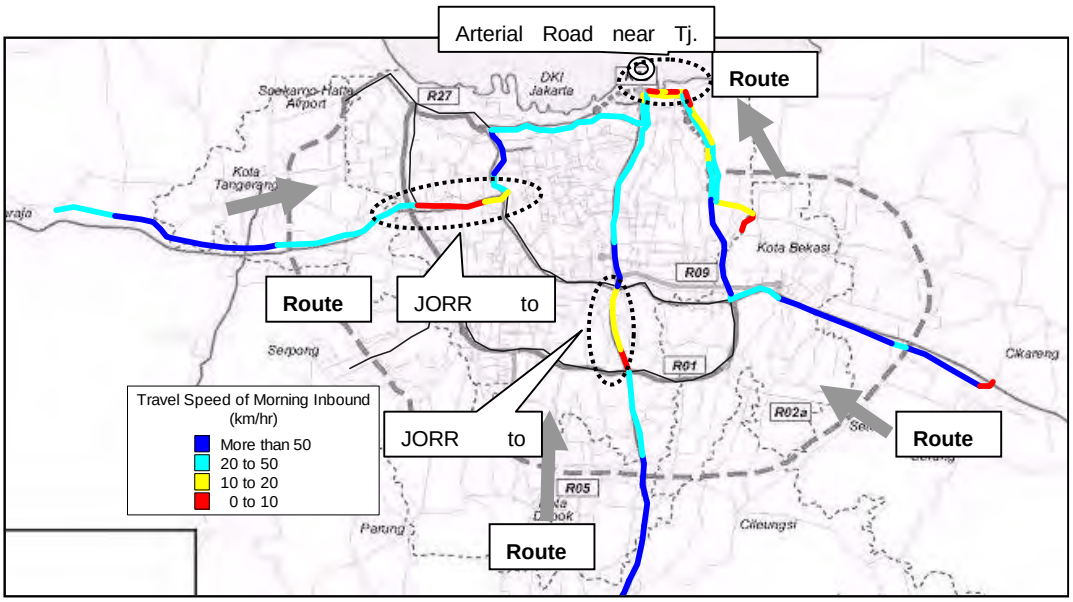


Figure 3.4 Travel speed of Morning Peak (Inbound)

3.3 Examination of Newly Emerged Development Plans Affecting Traffic Demand

The detailed design carried out in 2007 was based on a traffic demand forecast which set the target year to 2020. In this study, the future vehicle OD table which set target year to 2030 is created, by initiating the following development projects:

(1) Trend Growth After 2020

- Although the economic activities in Jakarta City are now quite activated, use of toll roads does not increase significantly. It seems that the traffic demand has reached the capacity of toll roads. Even if the potential traffic demand exists, the use of toll roads is limited or remains to be in a low level.

- In the Jabodetabek, aggressive road improvement has been carried out in order to meet the increasing traffic demand. However, such improvement project could still not cope with the increasing traffic demand. Besides, rapid improvement cannot be expected in the future, either. Therefore, about 2% of the annual growth rate of traffic volume was assumed after 2020, and consequently, the traffic volume in 2030 was calculated to be 1.22 times of the traffic volume in 2020 by each OD pair.

(2) Development Projects to be Considered

The three development projects which should be considered are as follows:

- Container Terminal Expansion Plan in Tanjung Priok Port
- Ancol Area Development Plan
- Marunda Area Development Plan

1) Container Terminal Expansion Plan in Tanjung Priok Port

PT.Pelindo II stimulates a plan; filling in the east Ancol area, neighboring to the west breakwater in Tanjung Priok Port. They will complete the construction in the next three or four years, and will then start operation (See Figure 3.5). This expansion project aims to solve the lack of facilities' capacity in Tanjung Priok Port, and to partially meet the demand in the port. The increase in traffic volume related to Tanjung Priok Port activities is estimated until 2025 in the detailed design phase. The growth rate after 2025 is set based on the rate until 2025. It is as follows:

Increase ratio per annum after the year 2020

	Passenger cars	Trucks
2020-2025	2.4%	2.0%
2025-2030	2.0%	1.5%

Moreover, this facility or expanded area is assumed to start operating after 2014. Said facility is supposed to absorb the 50% of the increasing traffic volume related to Tanjung Priok Port activities.

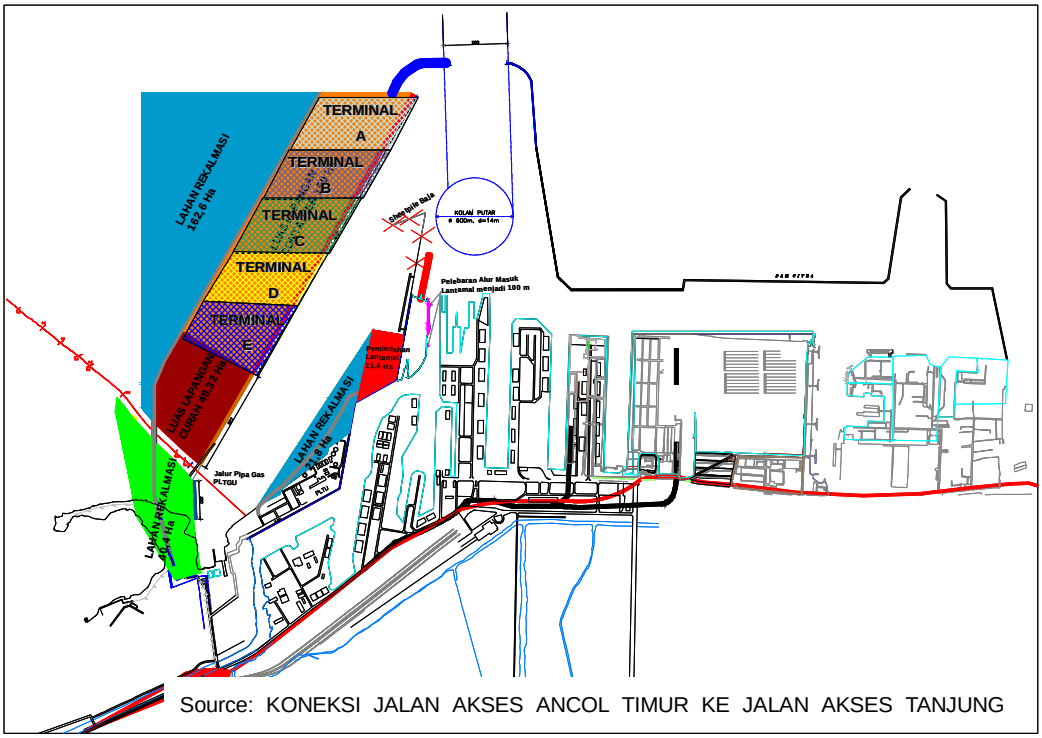


Figure 3.5 Development Plan of Ancol Timur

2) Ancol Area Development Plan

A seaboard in the northern part of Jakarta City is reclaimed, and planned to be converted to residential h ouses, of fice buildings, ho tels, com mercial en tertainment f acilities, publ ic facilities, and parks (See Figure 3.6 and Table 3.3).

Figure 3.6 Location of Ancol Development

Table 3.3 Traffic Generation and Attractive by Zones

Zone	2015			2025		
	Attraction	Generation	Total	Attraction	Generation	Total
1				1,664	3,092	4,756
2				543	1,010	1,553
3				12	12	24
4	98	182	280			
5	742	1,381	2,123			
6	337	626	963			
7				433	799	1,232
8	688	1,278	1,966			
9				1,793	3,316	5,109
10				2,796	5,114	7,910
11	1,787	3,307	5,094			
12				1,301	2,370	3,671
13				1,155	2,102	3,257
14	798	1,484	2,282			
15	798	1,478	2,276			
16	398	679	1,077			
17	1,201	1,547	2,748			
18	1,089	2,483	3,572			
TOTAL	**7,936**	**14,442**	**22,378**	**9,698**	**17,815**	**27,513**

Source: PSUD, PT.LAPIITB

3) Marunda Area Development Plan

In Marunda area, KBN, which central government and D KI Jakarta has invested on and established, has been proceeding with a development program. At the detailed design phase, 400 ha of Special Economic Zone or SEZ (40% of the entire section was occupied) was developed first. Since the development area is planned to be expanded, the future traffic demand is calculated as an annually increasing rate of 3% after 2020.

Source: KBN

Figure 3.7 KBN Marunda SEZ Development Plan

3.4 Development of Alternative Traffic Demand Forecast Cases

Table 3.4 shows the cases of the demand forecast carried out in this study.

Table 3.4 Cases for Demand Forecast

Network	Examine Cases of Traffic Demand Forecast													
	Exist Toll Network	Phase1 and Phase2				Survey Section				Target Year (OD)			Tariff System(*)	
		E-1	E-2	E-2A	NS	W-1	W-2	Direct Ramp	Ancol IC	2013	2016	2030	Integrated	Independent
Base	○	○	○	○	○	—	—	—	—	①	②	③	○	
Case1	○	○	○	○	○	○	○	—	—	—	④	⑤	○	
Case2	○	○	○	○	○	—	—	○	—	⑥	⑦	⑧	○	
Case3	○	○	○	○	○	○	○	○	—	—	⑨	⑩	○	
Case4	○	○	○	○	○	○	○	○	—	—	⑪	⑫		○
Case5	○	○	○	○	○	○	○	○	○	—	⑬	⑭	○	

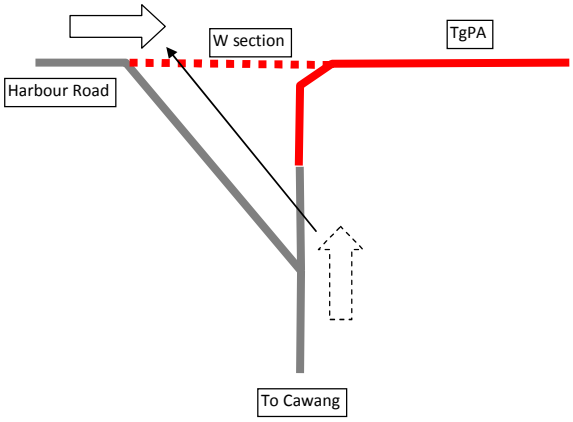
(*) Tariff System : Integrated Case means 7,000 Rupiahs is applied to all JORR and TgPA.
Independent case means 4,000 Rupiahs is applied to TgPA independently apart from JORR.

3.5 Update of Traffic Demand Forecast

3.5.1 Base Case and W Section (Base Case and Case 1 of Demand Forecast)

The forecast result of the Base Case, where only Phase 1 and Phase 2 are constructed, is shown in Figure 3.8. Meanwhile, the result of the case where the W Section is constructed as well is shown in Figure 3.9.

When the W-1 and W-2 sections are constructed, the traffic of N-S Link is smaller compared with the Base Case, but on the contrary, the traffic in other sections of TgPA appears larger while efficiency of TgPA is improving. Moreover, it is judged that the traffic of the N-S Link decreases because traffic that took such route to the Tanjung Priok Port area from the south when there is no W Section, diverts to the route from the Harbor Road to the W section of TgPA (See adjacent Figure).



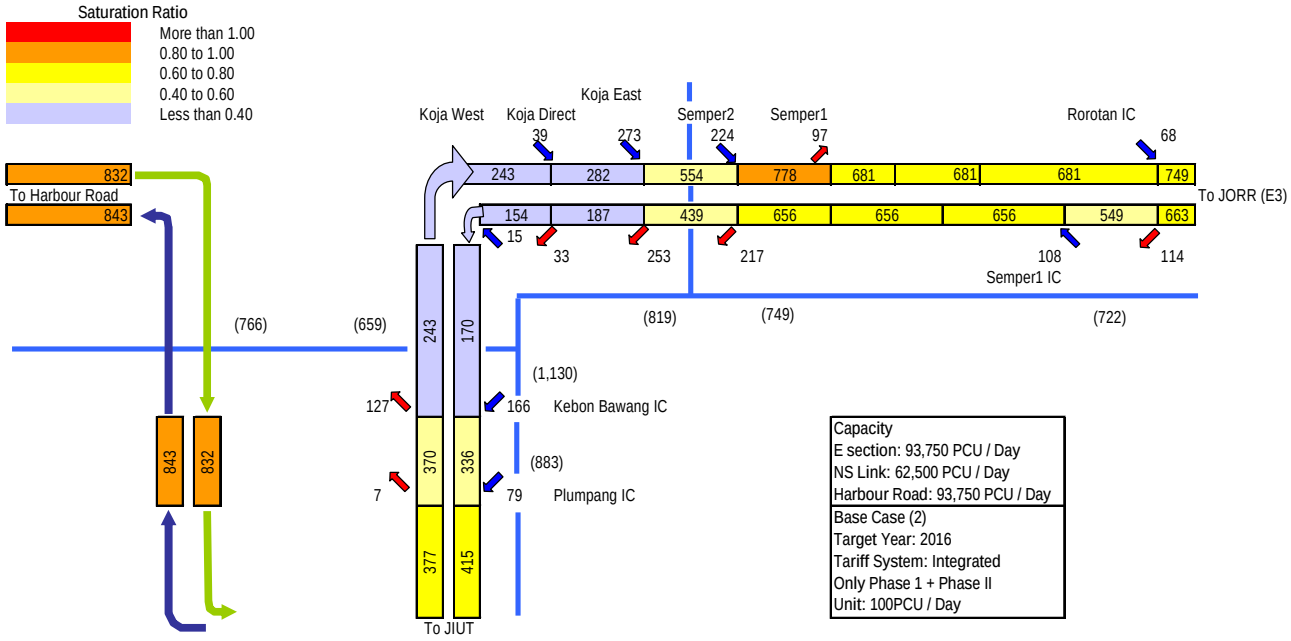


Figure 3.8 Assignment Traffic Volume (Base Case – Year 2016)

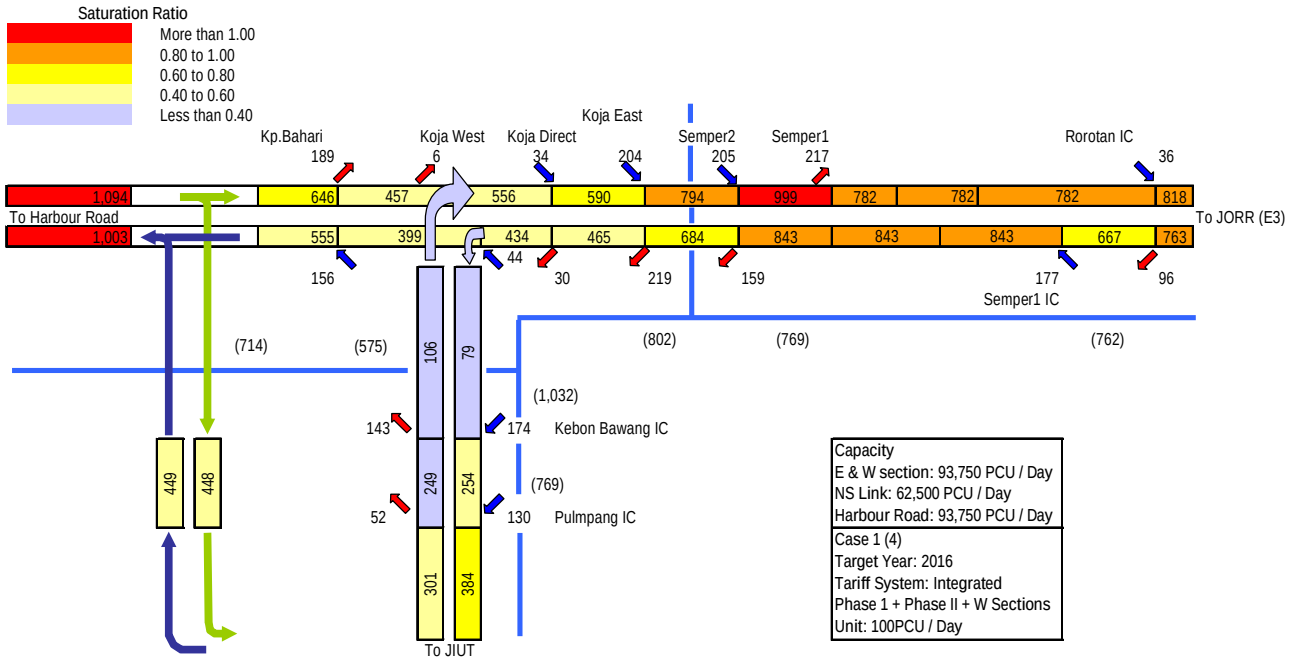
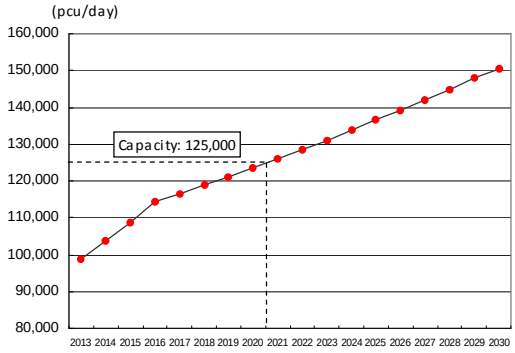


Figure 3.9 Assignment Traffic Volume (Case 1 – Year 2016)

3.5.2 Base Case＋Direct Ramp (Case 2 of the Demand Forecast)

The forecast result in case only the Direct Ramp is constructed as well as Phase 1 and Phase 2 is shown in Figure 3.10.



It is found that the traffic of the TgPA increases even if only the N-S Direct Ramp is constructed, and contributes to the efficient improvement of TgPA. However, the traffic volume of the ramp will exceed its capacity by around 2021 considering the traffic growth rate after the operation of TgPA. Furthermore, the efficiency of TgPA is supposed to decrease in the future considering that only the Direct Ramp is constructed (See above Figure).

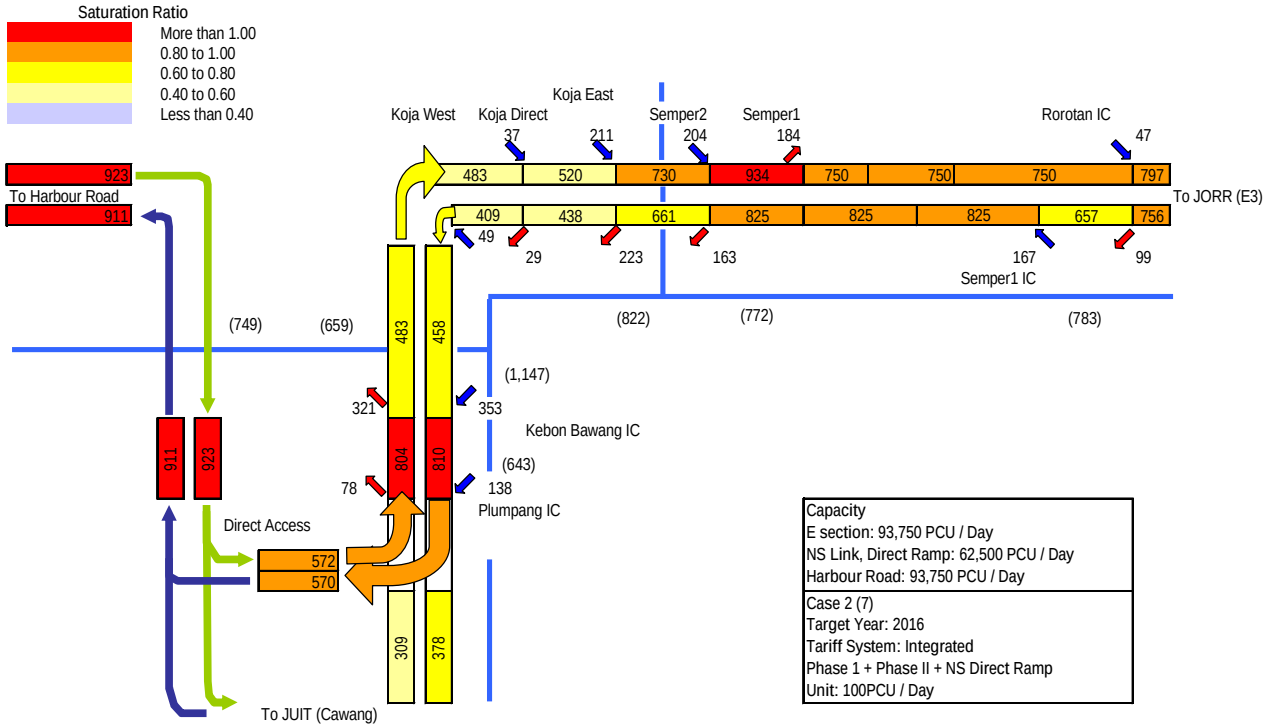
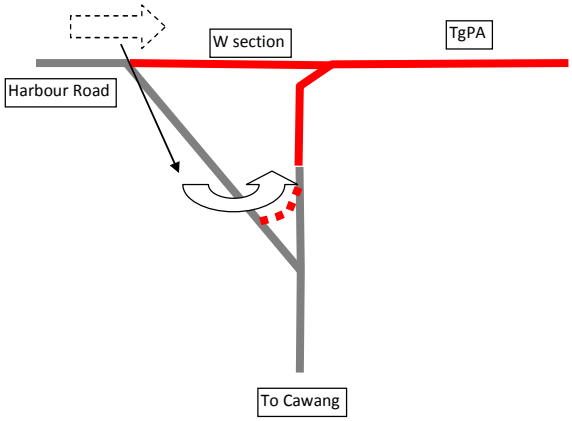


Figure 3.10 Assignment Traffic Volume (Case 2 – Year 2016)

3.5.3 Base Case, W Section and Direct Ramp (Case 3 of Demand Forecast)

The forecast result in case the W Section and Direct Ramp are constructed as well as Phase1 and Phase 2 is shown in Figure 3.11.

When the Direct Ramp is constructed as well as the W Section, the traffic in the eastern sections, from Semper to Koja, does not changed significantly. On the other hand, the traffic along the W Section decreases while that along the N-S Link increases. Moreover, the traffic along the arterial roads parallel to the W Section and N-S Link decreases, Thus, the Direct Ramp alleviates the traffic jam in the arterial roads (See right Figure).



Therefore, from the viewpoint of traffic control, construction of the Direct Ramp as well as the W Section is preferable since apart from improving the efficiency of TgPA, it also alleviates the traffic congestion along the arterial roads around Tanjung Priok Port. However, construction of only the Direct Ramp is not desirable because the traffic will soon exceed the route capacity, although a short-lived positive effect can be expected.

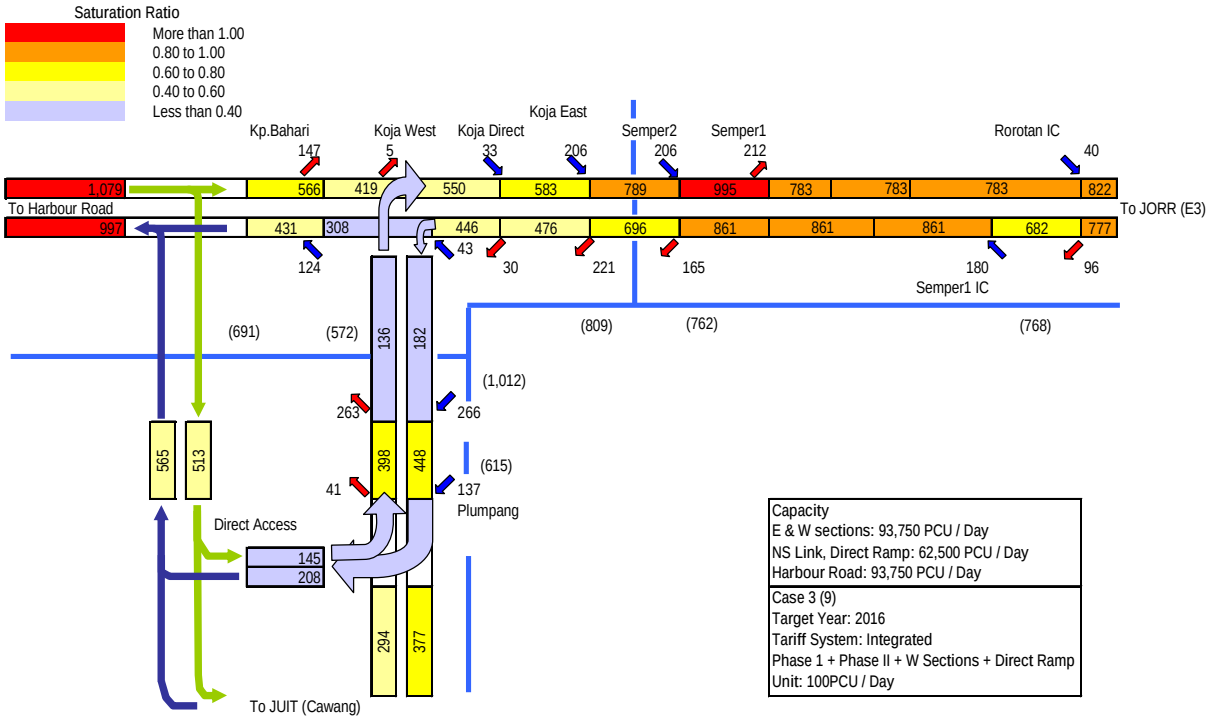


Figure 3.11 Assignment Traffic Volume (Case 3 – Year 2016)

3.5.4 Impact Analysis of Tariff System (Case 4 of Demand Forecast)

The fare system of TgPA is basically a flat rate with JORR (Rp. 7,000). However, Figure 3.12 shows the assignment volume result of the case when TgPA fare is Rp. 4,000, independent from JORR.

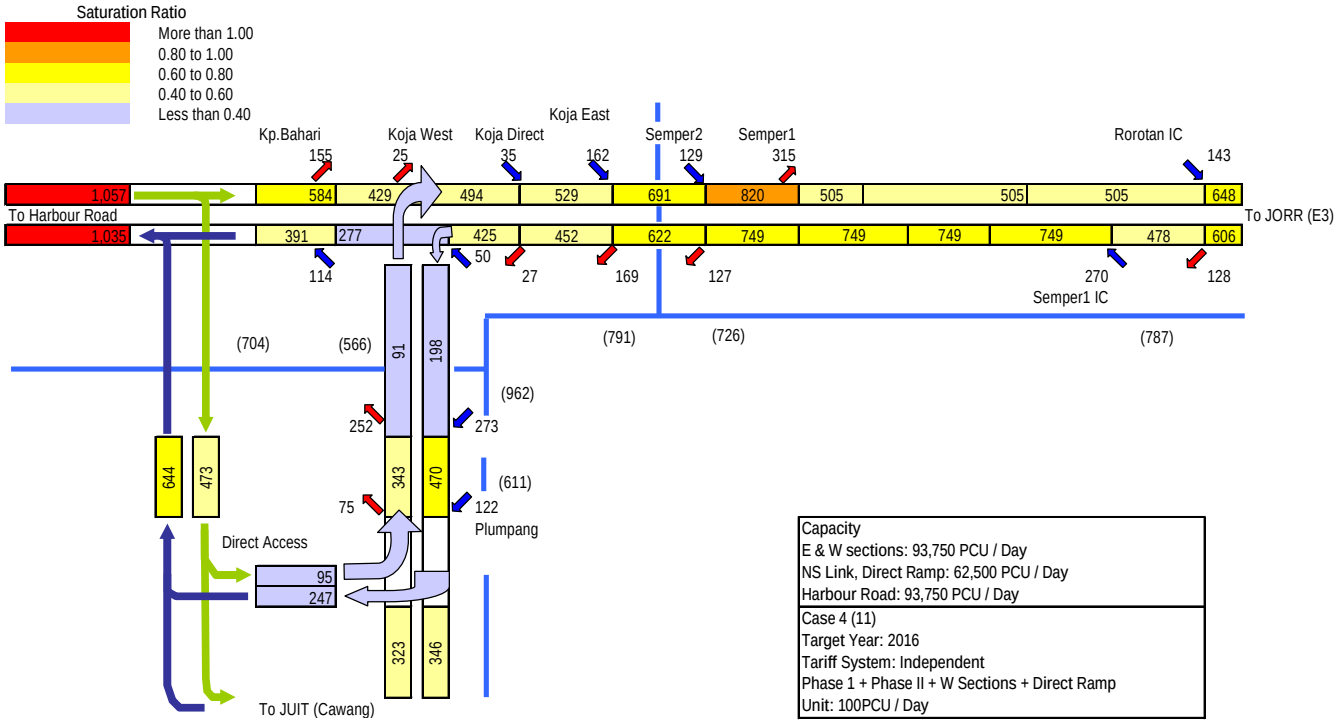


Figure 3.12 Assignment Traffic Volume (Case 4 – Year 2016)

The traffic volume of TgPA is generally decreasing because of the fare resistance when the toll system of TgPA is independent from JORR. However, the traffic volume which has to pay tariff according to the TgPA system will increase as compared with the flat rate along JORR, since such fare is imposed against in-flow traffic from JORR.

Table 3.5 indicates the comparison of the total fare income between adoption of flat rate system and independent rate system. When the latter is adopted, total fare income is below that of the flat rate system, although the motorists are obliged to pay. Furthermore, O&M cost is expected increase due to the construction of toll barrier at the connecting point with JORR. Furthermore, congestion at the toll barrier is forecasted.

Therefore, flat tariff with JORR is desirable from the viewpoint of toll road operation, and financial aspect of TgPA.

Table 3.5 Comparison of total tariff income

tariff system	Traffic volume with payment (PCU/day)	Total tariff income (1,000Rp./day)
Flat tariff (Rp.7,000)	122,300	122,300 x 7,000 = 856,100
Independent tariff (Rp.4,000)	164,400	164,400 x 4,000 = 657,600

3.5.5 Analysis of Impact to the Road Network

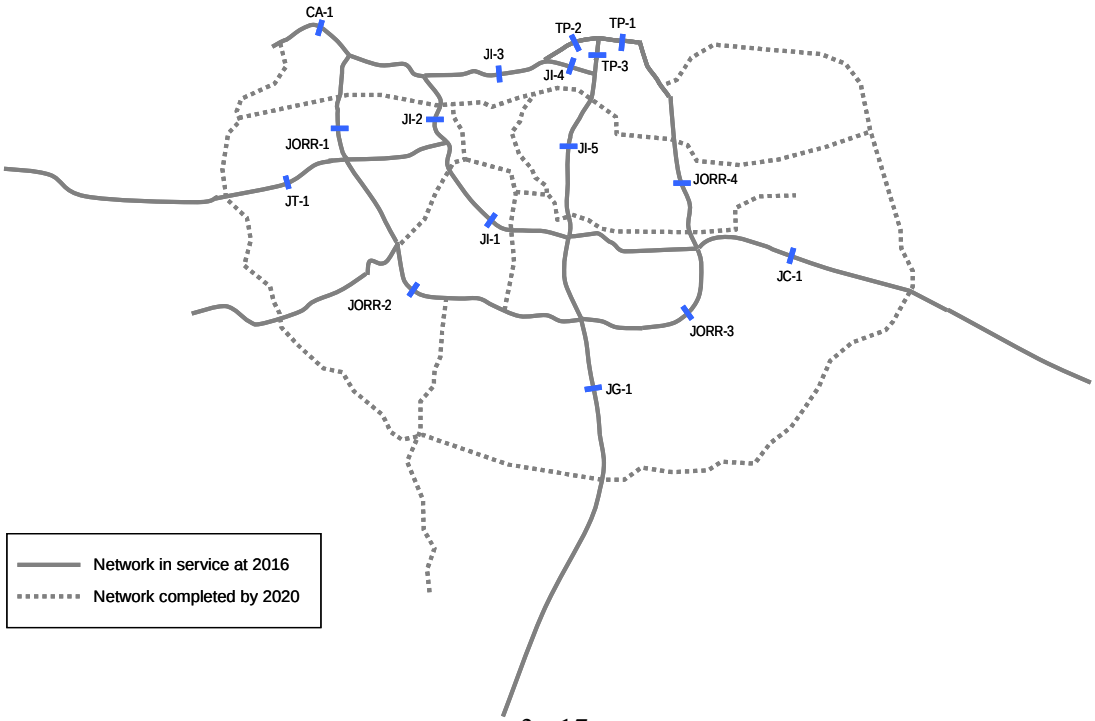
Table 3.6 indicates the assignment result of the main section of toll road by base case and each alternative case. When the TgPA W section and/or N-S Direct Ramp are constructed, traffic volume of JIUT (Cawang-Tj. Priok, JI-5) is expected to decreased while one of JORR eastern section (JORR-4) will increase. It is forecasted that the traffic to Tanjung Priok from Jakarta – Cikampek Toll Road will divert through JIUT from JORR. If the W section is developed, traffic volume of a Harbor Road section (JI-4) is evidently decreased. This indicates that the traffic flow from Harbor Road to Tanjung Priok diverts to the TgPA W section.

Table 3.6 Assignment result by alternative case and by toll road section

Toll Road	Section	Base Case	Base Case + W section	Base Case + Direct Ramp	Base Case + W section + Direct Ramp
			Case 1	Case 2	Case 3
Jagorawi	JG-1	167,049	167,480	165,085	166,691
Jakarta-Cikampek	JC-1	210,393	211,306	210,442	210,459
Jakarta-Tangerang	JT-1	166,466	166,125	168,488	166,802
Cengkareng Access	CA-1	141,491	141,996	142,228	142,205
JIUT	JI-1	181,171	177,740	181,287	179,443
	JI-2	126,427	129,835	126,816	128,046
	JI-3	207,337	207,097	205,476	201,491
	JI-4	167,525	89,623	183,335	107,800
	JI-5	205,736	194,082	190,306	189,750
JORR W1	JORR-1	170,447	163,315	168,258	165,035
JORR S	JORR-2	207,737	205,811	204,364	205,389
JORR E	JORR-3	171,050	171,380	170,497	173,733
	JORR-4	163,019	174,012	171,565	175,425
TGPA	TP-1	46,838	105,462	95,811	105,854
	TP-2	0	84,968	0	72,186
	TP-3	41,241	18,574	94,077	31,733

: Increase more than 5% compared with Base Case

: Decrease more than 5% compared with Base Case



CHAPTER 4 REVIEW OF ROAD DESIGN AND COST ESTIMATE

4.1 Review of Existing Road Designs and Recommendations on Alternatives

4.1.1 Review of Existing Designs

The summary of the original structures of the W-1, W-2 and Direct Ramp sections are shown in the following Table 4.1.

Table 4.1 Summary of Original Structures

Section	Viaduct	Station		Structure		Length	Width	Area
		from	to	Superstructure	Substructure	m	m	m2
W-1	Viaduct-2	8+62.5	8+127.5	Steel Box (simple)	Y-pier, Portal	65	29	1,885
	Viaduct-3	8+127.5	8+341	PC-U	Y-pier, Portal	214	29	6,163
	Viaduct-4	8+341	8+806	Steel Box(continouus)	Y-pier, Portal	465	27	12,776
	Viaduct-5	8+806	9+508.5	PC Box	Y-pier	703	27	19,237
	Viaduct-6	9+508.5	9+573.5	Steel Box (simple)	Y-pier, Portal	65	28	1,841
	Viaduct-7	9+573.5	10+423.5	PC Box	Y-pier, Portal	850	27	22,954
	Koja West Off Ramp Viaduct-1	0+129.9	0+194.9	Steel Box (simple)	I-pier	65	7	455
	Koja West Off Ramp Viaduct-2	0+194.9	0+438.4	PC-U	I-pier	289	7	2,019
	Arterial Road							
	Sub Total					2,716		
W-2	Viaduct-1	10+423.5	10+828.5	PC-U	Portal	405	29	11,635
	Viaduct-2	10+828.5	11+250	PC-U	T-pier, Portal	422	25	10,550
	On Ramp Viaduct-1	0+0	0+389	PC-U	T-pier, Portal	389	23	8,862
	On Ramp Viaduct-2	0+389	0+745.7	PC-U	T-pier, Portal	357	11	3,991
	On Ramp Viaduct-3	0+745.7	0+935.7	Cable Stay	Pylon	190	9	1,645
	On Ramp Viaduct-4	0+935.7	1+327.6	PC-U	T-pier	392	9	3,677
	On Ramp Viaduct-5	1+327.6	1+712.6	PC-U	T-pier	350	8	2,908
	On Ramp Viaduct-6	1+712.6	1+937.6	PC-U	T-pier	260	7	1,898
	On Ramp Viaduct-7	1+937.6	2+64.9	PC-I	T-pier	125	5	635
	Off Ramp Viaduct-2	0+386.3	0+630.5	PC-U	I-pier	244	16	3,803
	Off Ramp Viaduct-3	0+630.5	0+778.9	PC-U	T-pier	148	12	1,767
	Off Ramp Viaduct-4	0+778.9	1+180	PC-U	T-pier	401	8	3,164
	Off Ramp Viaduct-5	1+180	1+705	PC-U	T-pier	525	8	4,408
	Off Ramp Viaduct-6	1+705	1+827.8	PC-I	T-pier	123	7	823
	Kp. Bhr On Ramp Viaduct-1	0+329.2	0+572.7	PC-U	T-pier	405	4	1,459
	Kp. Bhr On Ramp Piled Slab	0+229.2	0+329.2	Piled Slab	T-pier	100	7	700
	Kp. Bhr Off Ramp Viaduct-2	0+339.9	0+509.5	PC-U	T-pier	244	5	1,188
	Kp. Bhr Off Ramp Piled Slab	0+509.5	0+609.5	Piled Slab		100	7	700
	Arterial Road							
	Sub Total					5,180		
Direct Ramp	Ramp - A, Pile Slab	0+181.48	0+311.48	Piled Slab		130	8	1,066
	Ramp - A, from AA to PA. 9	0+311.48	0+625.00	PC - U Girder	T-pier	314	9	2,822
	Ramp - A, from PA.9 to PA. 16	0+625.00	0+814.00	PC - U Girder	T-pier	189	11	2,126
	Ramp - A, from PA. 16 to PA.	0+814.00	0+931.76	PC - U Girder	T-pier	118	9	1,060
	Ramp - A, from PA. 20 to the	0+931.76	0+941.261	RC Girder	T-pier	10	9	86
	Ramp - B, Pile Slab	0+153.25	0+273.25	Pile Slab		120	7	876
	Ramp - B, from AB to PB. 12	0+273.25	0+653.00	PC - U Girder	T-pier	380	10	3,608
	Ramp - B, from PB.12 to PB.	0+653.00	0+795.00	Steel Box Girder	T-pier	142	11	1,598
	Ramp - B, from PB. 15 to PB.	0+795.00	1+007.55	PC - U Girder	T-pier	213	10	2,019
	Ramp - B, from PB. 22 to the	1+007.55	1+017.05	RC Girder	T-pier	10	9	90
	Arterial Road							
	Sub Total					1,624		15,350

These structures were reviewed for recommendation in the cost reduction plan.

As a result of the review, most of the structures were found to be designed economically except for some structures stipulated in the following Table 4.2. Such structures were selected for consideration in the D/D stage for reasons such as aesthetic design and so on. Therefore, in order to reduce the construction cost, their structure types should be modified to achieve economic design.

Table 4.2 Structures to be modified

Section	Viaduct	Structure Type	Bridge Length
W-1	Viaduct-5 P	C-Box	703m
	Viaduct-7 P	C-Box	850m

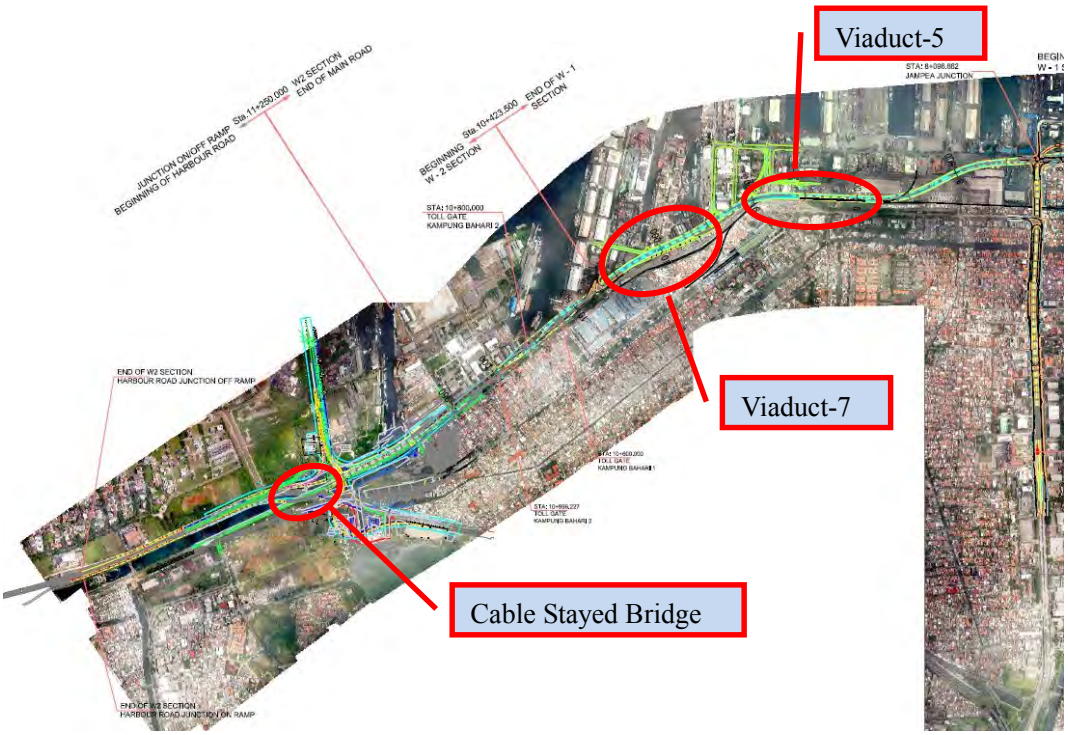
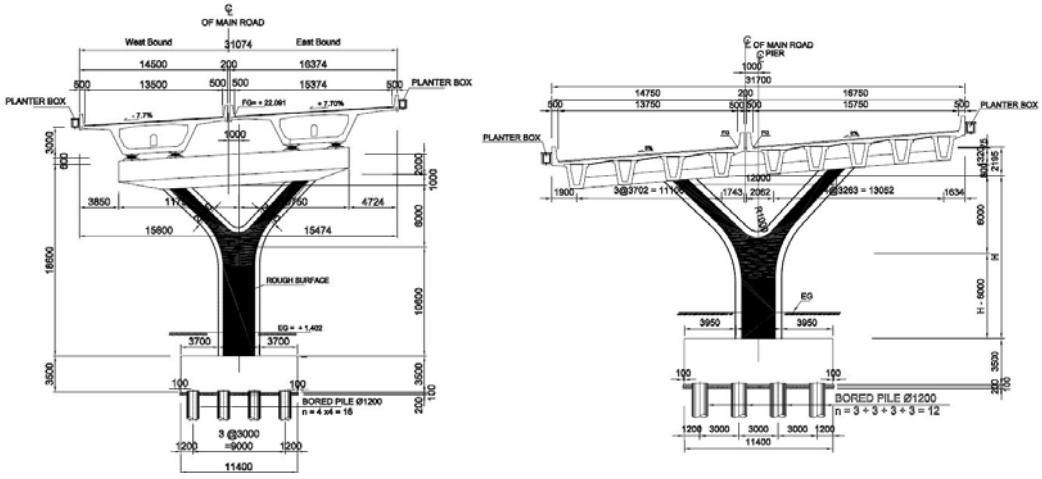


Figure 4.1 Location of Viaduct-5,7 and Cable Stayed Bridge

4.1.2 Modification of PC-Box Girders

PC-box girders with about 40m span length are located on Viaduct-5 and Viaduct-7 of the W-1 section. In consideration of the conditions of arterial roads and piers location, these PC-box girders of Viaduct-5 and Viaduct-7 can be modified to PC-U girders, which have already been applied in the E-1, E-2A, E-2, NS-Link and W-1 sections.



PC-Box Girder **PC-U Girder**

Figure 4.2 Cross Section of PC-box and PC-U

However, the economic span length of the PC-U girder is 35 m as applied in the other sections. Therefore, the span arrangement and pier location were studied in this survey. Corresponding study results are presented as drawings in the attached Appendix-4.

It is noted that said structures presented in the attached drawings resulted from rough designs. Therefore, detailed design for PC-U girders and their sub structures are required before construction. The period of detailed design for these structures is estimated to be approximately three months. The construction cost reduction is estimated in the following Table 4.3.

Table 4.3 Estimated Cost Reduction for applying PC-U Girders

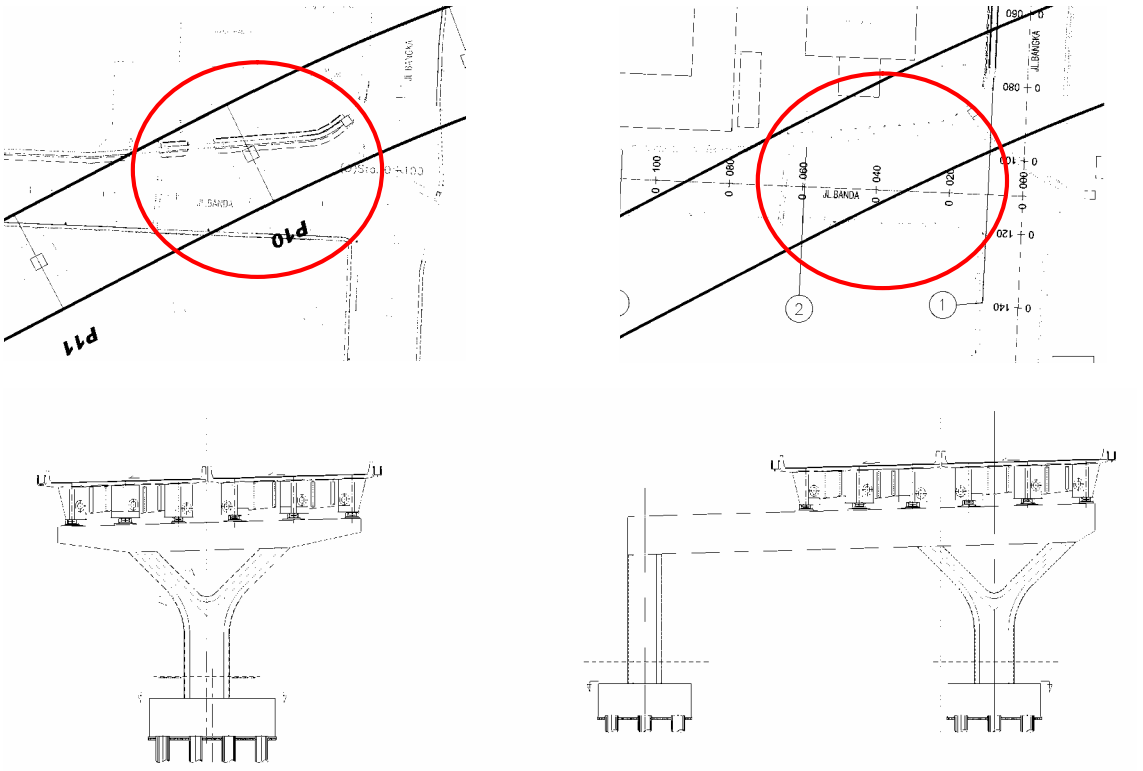
Viaduct and Station No.	Length	Original Structure	Alternative Plan	Cost Reduction
Viaduct-5, 8+806 to 9+508	702m	PC-Box Girder	PC-U Girder	Rp.59,443 million.
Viaduct-7, 9+573 to 10+423	860m	PC-Box Girder	PC-U Girder	Rp.82,863million

4.1.3 Road Improvement Project in the Port Area

The existing roads in the Port Area were improved by PT.Pelindo II after the D/D of TgPA. The modifications recommended by PT.Pelindo II were examined in order to decide whether to adopt them to TgPA D/D.

As a result of the confirmation, the pier location of Pier-10 of Viaduct-4 on W-1 section is required to be modified as shown in Figure 4.3. This modification only involves installation of additional one column and foundation. According to rough estimation, increased cost is Rp

2,500 million only.



O riginal design Modified design

Figure 4.3 Modification of Pier-10 of W-1 Section.

Thus, Pier-10 of Viaduct-4 on W-1 section is required to be subject to D/D prior to construction. The period of detailed design is estimated to be approximately two months

Other piers and alignment of TgPA need not be modified according to the Survey Team's review results.

4.2 Examination of Cost Reduction through Alternative Designs

The superstructure type consisting of PC-box girders was changed in order to reduce the construction cost as studied in Section 4.1.

The summary of construction cost reduction is shown in Table 4.4.

Table 4.4 Summary of Cost Reduction

Section	Viaduct	Station		Length	Width	Original Structure		Alternative Structure		Cost Reduction
		from	to	m	m	Type	Cost (Mill. Rp.)	Type	Cost (Mill. Rp.)	(Mill. Rp)
W-1	Viaduct-5	8+806	9+508.5	703	27	PC-Box	341,653	PC-U	282,210	59,443
	Viaduct-7	9+573.5	10+423.5	850	27	PC-Box	419,593	PC-U	336,730	82,863
	Sub Total						761,246		618,940	142,306

4.3 Update of Construction Cost

4.3.1 Update of Construction Cost

The construction cost is updated using the cost breakdown of TgPA. The alternative structures which have been recommended in Section 4.1 are reflected into the updated cost. Moreover, the construction cost is recalculated using the latest unit prices in 2010.

The construction cost of W-1, W-2 and Direct Ramp are calculated based on the following conditions:

- Phase 3: from Ramp Viaduct-1 of W-2 to the end of W-2 (2.1 km)
- Phase 4: the whole of the W-1 and Viaduct-1,2 of the W-2 section
- Phase 2: the whole of the Direct Ramp

The updated construction cost is summarized in Table 4.5.

Table 4.5 Updated Construction Cost

Phase	Section		Station		Structure		Length	Width	Area	Unit cost (mil. Rp/m2)		Const' cost	F/C	L/C
			from	to	Superstructure	Substructure	m	m	m2	main road	ramp	Mil. Rp	1000 JPY	Mil. Rp
Phase 4	W-1	Viaduct-2	8+62.5	8+127.5	Steel Box (simple)	Y-pier, Portal	65	29	1,885	25.85		48,731		
		Viaduct-3	8+127.5	8+341	PC-U	Y-pier, Portal	214	29	6,163	14.67		90,407		
		Viaduct-4	8+341	8+806	Steel Box (continouus)	Y-pier, Portal	465	27	12,776	38.44		491,095		
		Viaduct-5	8+806	9+508.5	PC-U	Y-pier	703	27	19,237	14.67		282,210		
		Viaduct-6	9+508.5	9+573.5	Steel Box (simple)	Y-pier, Portal	65	28	1,841	31.62		58,215		
		Viaduct-7	9+573.5	10+423.5	PC-U	Y-pier, Portal	850	27	22,954	14.67		336,730		
		Koja West Off Ramp Viaduct-1	0+129.9	0+194.9	Steel Box (simple)	I-pier	65	7	455		26.21	11,927		
		Koja West Off Ramp Viaduct-2	0+194.9	0+438.4	PC-U	I-pier	289	7	2,019		10.71	21,627		
		Arterial Road										134,094		
		Sub Total					2,716		67,330			1,475,036	4,469,361	1,032,526
	W-2	Viaduct-1	10+423.5	10+828.5	PC-U	Portal	405	29	11,635	18.80		218,735		
		Viaduct-2	10+828.5	11+250	PC-U	T-pier, Portal	422	25	10,550	12.52		132,074		
	Total Phase 4						827		67,330			1,825,845		
Phase 3	W-2	On Ramp Viaduct-1	0+0	0+389	PC-U	T-pier, Portal	389	23	8,862		12.18	107,934		
		On Ramp Viaduct-2	0+389	0+745.7	PC-U	T-pier, Portal	357	11	3,991		17.06	68,093		
		On Ramp Viaduct-3	0+745.7	0+935.7	Cable Stay	Pylon	190	9	1,645		78.57	129,266		
		On Ramp Viaduct-4	0+935.7	1+327.6	PC-U	T-pier	392	9	3,677		14.86	54,644		
		On Ramp Viaduct-5	1+327.6	1+712.6	PC-U	T-pier	350	8	2,908		11.72	34,087		
		On Ramp Viaduct-6	1+712.6	1+937.6	PC-U	T-pier	260	7	1,898		12.64	23,986		
		On Ramp Viaduct-7	1+937.6	2+64.9	PC-I	T-pier	125	5	635		13.47	8,556		
		Off Ramp Viaduct-2	0+386.3	0+630.5	PC-U	I-pier	244	16	3,803		13.03	49,551		
		Off Ramp Viaduct-3	0+630.5	0+778.9	PC-U	T-pier	148	12	1,767		14.29	25,247		
		Off Ramp Viaduct-4	0+778.9	1+180	PC-U	T-pier	401	8	3,164		12.21	38,636		
		Off Ramp Viaduct-5	1+180	1+705	PC-U	T-pier	525	8	4,408		11.79	51,974		
		Off Ramp Viaduct-6	1+705	1+827.8	PC-I	T-pier	123	7	823		11.40	9,380		
		Kp. Bhr On Ramp Viaduct-1	0+329.2	0+572.7	PC-U	T-pier	405	4	1,459		12.59	18,368		
		Kp. Bhr On Ramp Piled Slab	0+229.2	0+329.2	Piled Slab	T-pier	100	7	700		4.33	3,033		
		Kp. Bhr Off Ramp Viaduct-2	0+339.9	0+509.5	PC-U	T-pier	244	5	1,188		9.93	11,792		
		Kp. Bhr Off Ramp Piled Slab	0+509.5	0+609.5	Piled Slab		100	7	700		4.33	3,033		
		Arterial Road										98,839		
		Total Phase 3					4,353		41,629			736,419	2,231,349	515,493
Phase 2	Direct Ramp	Ramp - A, Pile Slab	0+181.48	0+311.48	Piled Slab		130	8	1,066		4.33	4,611		
		Ramp - A, from AA to PA. 9	0+311.48	0+625.00	PC - U Girder	T-pier	314	9	2,822		11.01	31,058		
		Ramp - A, from PA.9 to PA. 16	0+625.00	0+814.00	PC - U Girder	T-pier	189	11	2,126		10.79	22,946		
		Ramp - A, from PA. 16 to PA. 20	0+814.00	0+931.76	PC - U Girder	T-pier	118	9	1,060		11.54	12,229		
		Ramp - A, from PA. 20 to the end	0+931.76	0+941.261	RC Girder	T-pier	10	9	86		14.40	1,232		
		Ramp - B, Pile Slab	0+153.25	0+273.25	Pile Slab		120	7	876		4.53	3,972		
		Ramp - B, from AB to PB. 12	0+273.25	0+653.00	PC - U Girder	T-pier	380	10	3,608		11.05	39,865		
		Ramp - B, from PB.12 to PB. 15	0+653.00	0+795.00	Steel Box Girder	T-pier	142	11	1,598		27.81	44,420		
		Ramp - B, from PB. 15 to PB. 22	0+795.00	1+007.55	PC - U Girder	T-pier	213	10	2,019		11.18	22,570		
		Ramp - B, from PB. 22 to the end	1+007.55	1+017.05	RC Girder	T-pier	10	9	90		13.87	1,249		
		Arterial Road										15,886		
		Total Direct Ramp					1,624		15,350			200,037	606,112	140,026
	Total (W-1 + W-2 + Direct Ramp)											2,762,301	7,306,821	1,688,045

4.3.2 Land Acquisition Cost

Estimated cost of land acquisition is shown in Table 4.6.

Table 4.6 Land Acquisition Cost Estimation

No	Section	Land Requirement (m2) and Acquisition cost estimate (Million Rp)															Total Area	Total Cost Estimate
		Private			STATE OWNED ENTERPRISES/ REGIONAL OWNED ENTERPRISES (BUMN/BUMD)									Government				
					PT Pelindo II			PT KAI			PT Pemb. Jaya Ancol			Pemprov DKI				
		Area(m2)	Unit(Rp.)	Cost (Mill. Rp)	Area(m2)	Unit(Rp.)	Cost (Mill. Rp)	Area(m2)	Unit(Rp.)	Cost (Mill. Rp)	Area(m2)	Unit(Rp.)	Cost (Mill. Rp)	Area(m2)	Unit(Rp.)	Cost (Mill. Rp)	(m2)	(Mill. Rp)
1	Direct Ramp	3,857	6,785,000	26,170										101	6,785,000	685	3,958	26,855
2	W1	1,868	5,025,000	9,387	2,402	5,025,000	12,070	64	5,025,000	322							4,334	21,778
3	W2				20,444	5,025,000	102,731	588	5,025,000	2,955	3,574	5,025,000	17,959				24,606	123,645
Total		5,725		35,556	22,846		114,801	652		3,276	3,574		17,959	101		685	32,898	172,279

4.4 Estimate of O&M Cost

4.4.1 O&M Cost Estimate Procedure

O&M cost consists of maintenance cost, operation cost and construction of operation facilities such as toll gate, toll collection system and operation center. These costs are estimated in accordance with Table 4.7.

Table 4.7 O&M Estimation Method

Estimated Item	Estimation Method
Maintenance Cost	Referring to Pt.Jasa Marga's Maintenance cost.
Operation Cost	Referring to Pt.Jasa Marga's operation cost.
Operation Facilities	Based on contract price of E-1 section

4.4.2 Estimate of O&M Cost

The O&M cost is estimated based on the above maintenance cost, operation cost and construction cost of facilities. Moreover, the operation period is assumed to be 30 years. The O&M cost is summarized in Table 4.8.

Table 4.8 Summary of O&M Cost

Year			0	5	10	15	20	25	30
E-1	Maintenance	Routine	2,600	3,803	5,090	6,496	8,291	10,581	13,504
		Periodical		203	272	347	443	565	721
	Operation		18,110	26,487	35,446	45,239	57,737	73,689	94,048
	Operation Center & Facilities		13,198	0	0	660	0	0	660
	Total		34,048	30,493	40,807	52,741	66,470	84,835	108,933
E-2	Maintenance	Routine	2,096	3,065	4,102	5,235	6,681	8,527	10,883
		Periodical		164	219	279	357	455	581
	Operation		14,595	21,345	28,565	36,457	46,530	59,385	75,792
	Operation Center & Facilities		14,218	0	0	711	0	0	711
	Total		31,021	24,574	32,886	42,682	53,567	68,367	87,966
E-2A	Maintenance	Routine	1,469	2,148	2,874	3,668	4,682	5,975	7,626
		Periodical		115	153	196	250	319	407
	Operation		10,227	14,957	20,016	25,547	32,605	41,613	53,109
	Operation Center & Facilities		8,759	0	0	438	0	0	438
	Total		20,533	17,220	23,044	29,849	37,536	47,907	61,581
NS-Link	Maintenance	Routine	1,713	2,506	3,353	4,280	5,462	6,971	8,897
		Periodical		134	179	228	292	372	475
	Operation		11,932	17,450	23,352	29,804	38,039	48,548	61,961
	Operation Center & Facilities		9,719	0	0	486	0	0	486
	Total		23,455	20,090	26,885	34,798	43,792	55,891	71,819
W-1	Maintenance	Routine	1,805	2,640	3,533	4,509	5,755	7,345	9,374
		Periodical		141	189	241	307	392	500
	Operation		12,571	18,385	24,604	31,401	40,077	51,149	65,280
	Operation Center & Facilities		13,079	0	0	654	0	0	654
	Total		27,551	21,166	28,325	36,804	46,138	58,885	75,808
W-2	Maintenance	Routine	2,226	3,255	4,356	5,560	7,096	9,056	11,558
		Periodical		174	233	297	379	483	617
	Operation		15,500	22,670	30,337	38,719	49,416	63,069	80,494
	Operation Center & Facilities		11,728	0	0	586	0	0	586
	Total		29,573	26,099	34,926	45,162	56,891	72,609	93,256
Direct Ramp	Maintenance	Routine	841	1,230	1,647	2,102	2,682	3,423	4,369
		Periodical		66	88	112	143	183	233
	Operation		5,859	8,569	11,468	14,636	18,680	23,841	30,427
	Operation Center & Facilities		3,299	0	0	165	0	0	165
	Total		10,045	9,866	13,202	17,015	21,505	27,447	35,195
Total	Maintenance	Routine	12,750	18,647	24,954	31,849	40,648	51,878	66,211
		Periodical		995	1,332	1,700	2,170	2,769	3,534
	Operation		88,794	129,865	173,788	221,803	283,083	361,293	461,112
	Operation Center & Facilities		74,000	0	0	3,700	0	0	3,700
	Total		176,225	149,507	200,075	259,052	325,900	415,941	534,558

CHAPTER 5 ESTIMATION OF PROJECT EFFECT

5.1 Economic and Financial Valuation

(1) Effect to be Estimated in the Economic Valuation

Savings in vehicle operating cost (VOC) and travel time cost (TTC) should be estimated as the economic benefit. The economic benefit is evaluated by comparing the "with project" and "without project" cases. And in this case, the definitions of "with project" and "without project" are as follows:

Table 5.1 Comparison of the economic benefit

Without Project		The base road network consisting solely of the section E-1, which is under construction; and the section E-2, E-2A and NS-Link, which are in the coarse of bidding.
With Project	Alternative 1	Alternative in which only the section W-1 and W-2, the initially planned sections, are added to the above base road network.
	Alternative 2	Alternative in which only the section Direct Ramp are added to the above base road network.
	Alternative 3	Alternative in which the section W-1, W-2 and Direct Ram are added to the above base road network.

Firstly, we calculate the total VOC and total TTC based on the result of transport demand forecasting of the base road network and each alternative, unit price of VOC (Rp./car/km) and unit price of TTC (Rp./car/km). Then we evaluate the difference between the without case and with case as the economic benefit.

1) Economic Benefit

Table 5.2 shows the results of the economic benefit valuation. Compared to the savings in operating cost, the savings in traveling time is much bigger. It also indicates that Direct Ramp is predicted to generate big benefit during inception, but as we mentioned in Chapter 3, traffic volume would exceed the maximum capacity in 2021 and consequently, benefit would decrease from then on.

Table 5.2 Valuation results of the economic benefit

(Million JPY/ year)

Alternatives	Year	Vehicle Operating Cost Savings	Vehicle Time Cost Savings	Total
1. W -1+W-2	2016	755.8	6,664.3	7,420.1
	2030	209.2	7,533.8	7,743.0
2. D irect Ramp	2013	383.2	1,718.9	2,102.1
	2016	459.3	352.0	811.2
	2030	-22.0	210.0	188.1
3. W -1+W-2+Direct Ramp	2013	383.2	1,718.9	2,102.1
	2016	1,303.4	8,164.9	9,468.2
	2030	273.0	8,695.0	8,968.0

2) Construction and Maintenance Costs

Construction and maintenance and repairing costs estimated in the previous chapter were multiplied by 85% to convert them into economic prices. The costs in each year are as follows:

Table 5.3 Construction cost（The economic price）

(Million JPY/ year)

Year	Phase I + Phase II	W-1, W-2 Sections	Direct Ramp
2006 191.5		0.0	0.0
2007 766.0		0.0	0.0
2008 2,052.5		0.0	0.0
2009 5,935.3		0.0	0.0
2010 7,105.3		0.0	0.0
2011 15,974.	4	528.0	127.2
2012 1	1,270.2	1,432.6	968.5
2013 2,963.4		12,911.6	1,747.4
2014 0.0		14,797.6	309.6
2015 0.0		6,932.4	0.0
Total 46,258.	5	36,602.2	3,152.7

Table 5.4 Repairing cost（Economic price）

(Million JPY/ year)

Phase I + Phase II	W-1, W-2 Sections	Direct Ramp
71.2 36.5		7.6

Table 5.5 Maintenance and operating cost（Economic price）

(Million JPY/ year)

Year	Base Case	Base Case + W Sections	Base Case + Direct Ramp	Base Case + W Sections + Direct Ramp
2016	614.7 802.4		766.0	804.9
2020	691.9 903.1		862.1	906.0
2025	802.1 1,046.9		999.4	1,050.3
2030	929.8 1,213.7		1,158.6	1,217.5

3) Economic Valuation

With the use of the cash flow calculated from costs and benefits in each year, we conducted cost benefit analysis and the results are indicated in Table 5.9. If EIRR is over 15%, projects are considered economically feasible. Thus, the alternatives are all regarded as feasible. Among them, Alternative 2 presents the highest EIRR, and Alternative 3 demonstrates the highest NPV and B/C values. In Alternative 2, however, the traffic volume is forecasted to exceed the capacity starting from 2021 and transport management problems are noted. Hence, Alternative 3, which is the plan of the existing project of Direct Ramp plus the added W section, is the most desirable overall plan.

Table 5.6 Economic evaluation results of TgPA

Alternative	EIRR	NPV (Mil. JPY) (R=15%)	B/C (R=15%)
1 Base Case + W Section	15.8	739.4	1.06
2 Base Case + Direct Ramp	22.5	314.4	1.19
3 Base Case + W Section + Direct Ramp	18.5	3,418.8	1.24

5.1.3 Financial Valuation

(1) Calculation of Revenue

Annual toll revenue was calculated for each alternative using future traffic volume estimated from the predicted demand and unit price. This research uses the flat rate (Rp 7,000) system for the fare structure in JORR. The way to calculate the fare income just for TgPA remains to be solved. However, in this research, we assumed that all fare incomes collected from on-ramps that are located in TgPA sections are presumed as revenues of TgPA. In addition, we assumed other income such as advertisement rate to be equal to 5% of the fare income.

(2) Financial Valuation

We evaluated the financial internal rate of return (FIRR) from the cash flow of fare income and financial cost (represented as market price). This rate of revenue is not related to the financial sources (thus, financial sources would not be specified) and gained from requisite investment fund, maintenance and operating cost, and income of the project. This rate corresponds to the return on investment (ROI).

Table 5.7 indicates the result of calculation. FIRR remains less than 3% in each alternative and it is financially tough to recover all the construction cost from the fare income.

Additionally, Figure 5.1 illustrates the variation of FIRR in Alternative 3 in terms of decreasing the construction cost. It is considered that an FIRR of 17% to 20% is necessary to implement the tollway under private resource utilization or private public partnership (PPP) schemes such as build operate transfer (BOT). This figure shows that if roughly 90% of the construction cost can be absorbed by the government (i.e., private sector bears only around 10% of the construction cost), the private sector will be able to operate the TgPA from fare income of the tollway even though it bears part of the construction cost and maintenance cost. (The details about PPP will be discussed in Chapter 7.)

Table 5.7 The result of the financial valuation

Alternative	FIRR	NPV (Mil. JPY) (R=15%)	B/C (R=15%)
1 Base Case + W Section	0.52	-40,133.5	-2.95
2 Base Case + Direct Ramp	2.93	-29,522.8	-1.86
3 Base Case + W Section + Direct Ramp	0.38	-41,324.7	-2.97

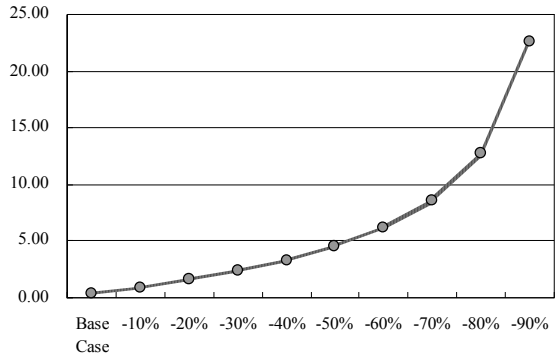


Figure 5.1 Sensibility analysis of the financial valuation（FIRR）

5.2 Estimation of Performance Indicators

Tables 5.8 and 5.9 show the performance indicators, which include the traffic volume of TgPA and travel time from the Tanjung Priok Port in the case of Alternative 3 where both W section and the Direct Ramp are constructed. The target values are estimated after two, five and seven years from the completion data in 2015. The traffic in the future increases remarkably compared with the base year. As for the roads around the Tanjung Priok Port, raffic jam occurs at present, and TgPA is supposed to absorb traffic from these congested roads. Moreover, the effect in terms of time savings from the Tanjung Priok Port to the east side (Cakung and Cikarang) and south side (Citeureup) of Jakarta is expected. However, the condition is estimated to become the same or worse than the current condition in 2020, i.e., five years after TgPA completion, because travel time cannot be avoided to increase due to the increase in the traffic volume even if the TgPA Project is executed. Therefore, the effect of travel time savings is large when comparing the "with project" and "without project" cases as shown in the figure below.

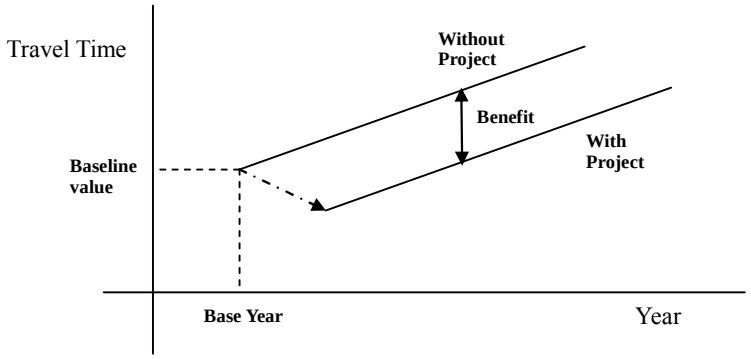


Table 5.8 Estimation of Performance Indicators (Traffic Volume)

B	ase year (Vehicles/day)	Target value (PCU/day)		
2010		2017	2020	2022
Arterial Road	99,578	84,100	93,800	100,200
TgPA -		109,600	120,700	128,100

Table 5.9 Estimation of Performance Indicators (Travel Time from Tanjung Priok Port)

	Base year (minutes)	Target value (minutes)		
201	0	2017	2020	2022
Cakung (13km)	35	36	43	47
Cikarang (43km)	78	70	80	87
Citeureup (43km)	54	50	64	74
Balaraja (72km)	109	115	133	144

CHAPTER 6 STUDY ON SOCIAL AND ENVIRONMENTAL CONSIDERATION

6.1 Confirmation of Policy and Schedule for Land Acquisition and Resettlement for Precedent TgPA Sections

6.1.1 Background and Current Status of Development

At present, more than 80% of the total land (excluding the E-1 section) required for the TgPA Project belongs to PT Pelindo (the state harbor company of Indonesia). Status of development of each section and land acquisition is as follows:

Table 6.1 Status of Project Development and Land Acquisition

Section	Status of Project Development/Land Acquisition	
E-1	Construction has been completed.	
E-2	The progress now is under tender for construction, whereas the process of land acquisition is not completed yet. There are four land owners, PT Pelindo, Navy, province government of DKI Jakarta and private sectors. Pelindo and DKI Jakarta have already given BINA MARGA the permit to use their lands, however the administrative procedures have not accomplished yet. In case of Navy area, the negotiation for land acquisition is still in progress, the preference of compensation is a barter which must be completed before 30 September 2010, and the construction will start in November 1st, 2010.	Tender process. Progress of land acquisition: S P2LP acquired, Announcement stage in the Figure next page (Land area to be acquired: 63,854 m^2)
E-2A	The progress of development is in pre-qualification. The status of land acquisition is not completed yet, but PT Pelindo and Pertamina accepted the request for land acquisition. Land acquisition must be finished by February 2011.	Approval Documents of PQ Progress of land acquisition: S P2LP acquired, Announcement stage in the Figure next page (Land area to be acquired: 53,809 m^2)
NS Link	The progress is in pre-qualification. The areas covered by the Project belong to private sector and state company. The process of land acquisition is on stage of waiting for announcement for the owner. For land acquisition of private sector, there is assistance as counterpart for this matter that comes from BPKP (State Finance and Development Auditor). The process must be finished by 10 December 2010.	Process of PQ Progress of land acquisition: S P2LP acquired, Announcement stage in the Figure next page (Land area to be acquired: 11,325 m^2)
Direct Ramp and W-1, W-2	Direct Ramp and W-1, W-2 are still in the stage of investigation and inventory and waiting for funding.	Loan Request Process Progress of land acquisition: S P2LP acquired, Identification/Inventory stage in the Figure next page (Land area to be acquired: 32,898 m^2)

6.1.2 Legal Basis of Land Acquisition for Public Facility Development

Procedures and process of land acquisition for public facility development are regulated by Presidential Decree No. 36/2005, Presidential Decree No. 65/2006, and Head of National Land

Affairs Agency Decree No. 03/2007. Land acquisition of the TgPA Project is also subject to these procedures and process. Although Bina Marga is the implementing agency of the TgPA Project, the task of land acquisition is entrusted to PT Jakarta Propertindo, a real estate development agent, under DKI Jakarta.

6.2 Confirmation of Social and Environmental Requirements

As mentioned, PT Jakarta Propertindo, together with the land provision committee, is now undertaking land acquisition for the TgPA Project. Details of the land areas to be acquired are shown below:

Table 6.2 Land to be Acquired for TgPA Project (Unit: m^2)

Section	Private	State owned enterprises/Regional owned enterprises					Government		Total
		PT Pelindo II	PT Pertamina	PT KAI	Bank Mandiri & Kantor PBB	PT Pemb. Jaya Ancol	Pemprov DKI	TNI-AL	
E-2 (2.74 km)	735	40,093	- -		-	-	3,321	14,705	63,854
E-2A (1.92 km)	- 52,	586	1,223	-	-	-	-	-	53,809
NS Link (2.24 km)	10,721	- -		-	352	-	252	-	11,325
Direct Ramp (1.1 km)	3,857						101	-	3,958
W-1 (2.36 km)	1,868	2,402 -		64	-	-	-	-	4,334
W-2 (2.91 km)	- 20,	444	-	588	-	3,574	-	-	24,606
Total	17,181	120,525 1,2	23	652	352	3,574	3,674	14,705	161,886

6.2.1 Resettlement and Relocation for the Direct Ramp

According to the EIA review report prepared by Bina Marga, 14 private landowners were identified to be affected by the implementation of the construction of the Direct Ramp. Details of the landowners affected in this area are shown below:

Table 6.3 Data of Land Acquisition in Direct Ramp Area

No.	Name of the Owner	Sta.	Location	Acquired Land (m2)
1	No information	0+250 – 0+350	Right	41.75
2	PT. Premigas	0+250 – 0+350	Right	215.55
3	PT. Primajaya	0+350 – 0+485	Right	294.18
4	Melineum Motor	0+490 – 0+550	Right	177.34
5	PT. Gasindo Bahtera Jaya	0+550 – 0+610	Right	220.51
6	Sata Blora (Restaurant)		Right	53.54
7	Kiosk dan PT. Genita Surya	0+610 – 0+690	Right	311.64
8	PT. Biro Klarifikasi Indonesia Persero	0+732 R	ight	225.58
9	Yard	0+680 – 0+420	Left	101.28
10	CV. Cepat	0+680 – 0+775	Left	194.38
11	SPBU Pertamina (Gas Station)	0+775 – 0+850	Left	90.48
12	Dunkin Donat Warehouse	0+850 – 0+929	Left	253.23
13	Showroom Toyota	0+928	Left	65.48
14	PT. Wahana Kontena Makmur	0+929	Left	5.45

On the other hand, illegal occupants live underneath the viaduct located in the west side of the new Direct Ramp. These viaducts have been constructed but have not been operated yet. This area where illegal occupants live is different from the construction area of the Direct Ramp proposed under the Japanese ODA. Thus, illegal occupants are not affected by the construction of the Direct Ramp in the Japanese ODA proposal. However, some countermeasures for illegal occupants will be required during construction in the upper part of the viaduct prior to operation.

Resettlement and relocation of illegal occupants prior to construction are the best countermeasures because the land underneath the viaduct belongs to the Indonesian government and is not permitted to be occupied. However, the superstructure of the viaduct has already been completed. Thus, the remaining works in this viaduct involve only miscellaneous works such as repair of pavement, lane marking and so on. Considering that the remaining works don't have serious impact to the illegal occupants underneath the viaduct and there is no clear legal basis for resettlement and relocation of illegal occupants, implementation of the remaining works without resettlement and relocation of illegal occupants can be considered to be the most realistic solution. In this regard, the countermeasures stipulated below are required:

- Construction work items and schedule must be informed to the illegal occupants for their understanding prior to construction.

- The Contractor must install a protection net under the viaduct to prevent falling objects, and must carry out the construction safely.

6.2.2 Background of the Environmental Requirements of the Project

Prior to the implementation of the EIA, the feasibility study (F/S) of the TgPA Project, which defined the general route alignment and basic design of TgPA, was carried out by the Japan Export Trade Organization (JETRO) in 2004. After the F/S, an EIA for the construction of the TgPA Project was conducted in 2004, and the EIA approval had been issued in December 2004 based on the scope and magnitude under the F/S. Sections covered by the 2004 EIA are shown below:

Table 6.4 Sections Covered by 2004 EIA

No.	Name of Section
1	W-1 (Penjaringan - Kebon Jeruk)
2	E-2 (Cikunir – Cakung)
3	E-3 (Cakung – Cilincing)
4	TgPA Access (E-1, E-2, E-2A, NS, W-1, W-2)

6.2.3 Necessity of Implementation of New EIA

As a result of survey, there are no serious changes in the design, location and magnitude of the Project as well as in the conditions of the social and natural environment between the F/S and D/D stages that have potential adverse impacts on the environment of the Project area. The 0.5 km segment of the NS Link has already been included in the F/S and covered by the area under the EIA conducted in 2004. The only remarkable difference between the F/S and D/D is the addition of the construction of the 1.1 km long Direct Ramp. The area where the Direct Ramp will be located has been covered and studied in the 2004 EIA. Furthermore, Decree No. 11/2006 of the Ministry of Environment prescribes that the construction of toll roads that exceed 5 km shall require the implementation of EIA in accordance with the relevant environmental regulations. This means that a new EIA may not be required for the construction of the Direct Ramp.

Considering the above, the following can be concluded with regard to the necessity of new/additional EIA:

- TgPA Project location in the D/D is the same as that in the F/S except for the addition of the Direct Ramp, i.e., the Project is located in north Jakarta covering three sub-districts (Cilincing, Koja and Tanjung Priok) and 13 villages. The additional five villages where the Direct Ramp is located are Rawa Badak Selatan, Rawa Badak Utara, Kebon Bawang, Papanggo, and Sungai Bambu. These areas have already been covered by the 2004 EIA.
- The remarkable change between the F/S and D/D is the additional construction of the

Direct Ramp. The environmental conditions such as physical, physiographical, hydrological, biological, socioeconomic, cultural and public health conditions, spatial and land use plan, and land acquisition are reviewed by Bina Marga mainly by comparing the F/S and D/D. Based on the results, it can be concluded that there are no significant or drastic changes in the basic environmental conditions in and around the Project area.

- As mentioned above, changes in the environmental impacts in the Project area caused by the changes of the scope of the Project including the Direct Ramp have been reviewed and evaluated. As a result, it is concluded that the EIA documents are available and the environmental worthiness of the Project is still valid. Moreover, a new/additional EIA may not be necessary since no significant changes have been observed in terms of the design and location of the Project as well as the environmental conditions. However, it should be noted that EIA matters are under the administration of the Ministry of Environment, and the review and study of the 2004 EIA were carried out just by the Bina Marga. According to an opinion of the Ministry of Environment, a re- approval of the newly-added Direct Ramp should be required in the EIA procedure based on Government Regulation No. 27/1999 (Article 25, 26 and 27), Decree No. 11/2006 of the Ministry of Environment, and related regulations instead of a full scale EIA implementation. In order to move forward to the next stage of the TgPA Project, a regular EIA procedure and/or process, which is prescribed by Government Regulation No. 27/1999 and other related legislations mentioned above, should be completed.

- According to Government Regulation No. 27/1999 and other related legislations, three documents, namely: 1) Environmental Impact Analysis Report (ANDAL), 2) Environmental Management Plan (RKL) and 3) Environmental Monitoring Plan (RPL), should be prepared under the implementation of EIA. Laws and regulations mentioned above prescribe to revise the ANDAL, RKL and RPL if the scope of the project and environmental conditions of the project area are changed after the approval of the EIA. The RKL and RPL are to be revised throughout the review of the EIA considering the changes of project scope, and the results of the review are to be reflected in the revised RKL and RPL. The revised RKL and RPL must be submitted to the AMDAL committee for re-approval.

- Apart from the revision of the RKL and RPL, Ministry of Environment Decree No. 86/2002 and No. 13/2010 regulate the procedures of the Environmental Management Efforts (*Upaya Pengelolaan Lingkungan*: UKL), Environmental Monitoring Efforts (*Upaya Pemantauan Lingkungan*: UPL) and the Statement Letter of Readiness of Environmental Management and Monitoring (*Surat Pernyataan Kesannggapan*

Pengelolaan dan Pemantavan Lingkungan: SPPL). UKL/UPL and SPPL are required for the project for which implementation of a full scale EIA is not required, such as construction of a short toll road less than 5 km.

- Bina Marga has already completed the review and revision of the RKL and RPL, but has not submitted them to the Ministry of Environment. In accordance with the EIA approval procedures, Bina Marga must inform the Ministry of Environment of the change of scope of the Project after the 2004 EIA as soon as possible to ask about the next action. After informing the Ministry of Environment, one of the options shown below could be taken by the Ministry of Environment for the environmental approval.

- After the completion of the construction of the TgPA Project, the roads will become operational. At this stage, noise and automobile exhaust emissions, which will arise from the increase of traffic, will have a significant impact on the environment. In order to keep the environment along the roads in good condition, environmental monitoring is needed. The environmental monitoring during the operation stage should be conducted according to the approved RKL and RPL. The result of the environmental monitoring should be utilized to evaluate the environmental protection measures taken and to adjust the implemented environmental plan.

CHAPTER 7 ALTERNATIVE PROJECT IMPLEMENTATION PLANS

7.1 Development of Alternative Project Scopes

Given that the Project has actually started in the E-1 section, construction of which is already completed, and E-2, E-2A and NS Link sections, in which tender for construction is in progress, there are two network portions to be additionally considered for completion of the whole TgPA network, namely, W-1 and W-2 sections, and the Direct Ramp. The former have been parts of the network originally while the latter was once studied in the F/S as a temporary alternative to W-1 and W-2.

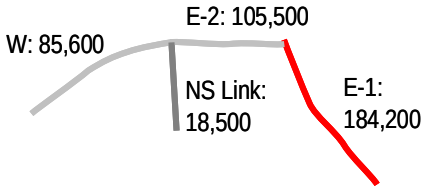
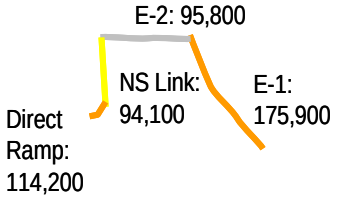
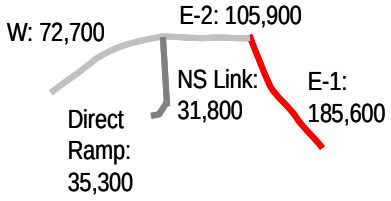
Consequently, the sections included in the alternative project scopes are as follows:

- Case 1 Construct W-1 and W-2 only,
- Case 2 Construct Direct Ramp only, and
- Case 3 Construct W-1, W-2, and Direct Ramp.

As for funding for the construction, the PPP scheme, even if partially, has been suggested by JICA as an effective option. However, the executing agency, Bina Marga, stated at first that they would consider PPP only for O&M of a single TgPA or a larger network of toll roads in Jakarta Metropolitan Area rather than for the construction of TgPA. On the contrary, GOI decided that the amount of the Japanese ODA loan that they will request for TgPA for 2011 will be no more than JPY 10 billion (US$120 million), which is far less than the amount required for the construction of W-1 and W-2 only, which is JPY 24 billion as described below. Therefore, the Survey Team has assumed that public funds, mainly from Japanese ODA loans, together with some other funds, sources of which have not yet been identified, would be used for the construction of the remaining part of the TgPA.

Derived from the results in previous chapters, the construction cost, traffic volumes, economic and financial indicators, etc. are summarized in Table 7.1 below.

Table 7.1 Attributes of Alternative Project Scopes

	Case 1	Case 2	Case 3
Composing Sections	W-1 and W-2	Direct Ramp	W-1, W-2, and Direct Ramp
Construction Cost (JPY Million) (2010 Price)	14,898 (W-1), 10,981 (W-2) 25,879 (Total)	2,020	27,899
Forecast Traffic Demand on Major Links (pcu/day in 2016) & Character of Network Flow **Saturation Ratio** More than 1.00 0.80 to 1.00 0.60 to 0.80 0.40 to 0.60 Less than 0.40	 Almost balanced flows over network, except for NS Link with too much capacity allowance	 Much load to Direct Ramp and NS Link. Traffic over capacity after 2021 on Direct Ramp.	 Reasonably balanced flows on most links
EIRR	15.8 % (Feasible)	22.5 % (Feasible)	18.5 % (Feasible)
FIRR	0.52 % (Not feasible)	2.93 % (Not feasible)	0.38 % (Not feasible)
Completeness of Network	Almost satisfactory	Irregular	Satisfactory
Overall Evaluation	Better	Recommendable for short-term only, but undesirable as an ultimate network	Best

7.2 Recommended Optimal Implementation Plan

Among the alternative cases of the scope of the Project, the Survey Team suggests that Case 3 would be the optimal implementation program for the completion of the TgPA network. Main reasons are as follows:

(1) According to the traffic demand forecast, even if only the Direct Ramp is constructed, the traffic flow in this link in one direction will exceed the upper average daily traffic (ADT) limit of 62,500 pcu/day by around 2022. Also, the connecting Harbor Road will be seriously affected by the unexpected increase of traffic flow due to the connection. Consequently, W-1 and W-2 must be completed before that.

(2) Unless W-1 and W-2 are constructed, the network will have an irregular shape and unnatural and inefficient traffic flow, causing the area some serious accessibility problems.

(3) The traffic demand is forecasted to maintain a reasonably justifiable level from the beginning of the operation of W-1 and W-2 in 2015 and steadily increases afterwards, if they are constructed.

(4) The contribution of the Direct Ramp, if it is constructed together with W-1 and W-2, to the traffic flow in the network may not be significant. In spite of the relatively low construction cost, the realized traffic flow is anticipated to be steady and harmoniously sufficient. The economic and financial evaluation also provided reasonably acceptable outcome. Thus, the cost-effectiveness of the construction of the Direct Ramp in addition to W-1 and W-2 will be justified.

(5) From the aspect of social and environmental consideration, some additional procedures for validation of the already approved EIA for the entire TgPA Project will be required if the Direct Ramp is added to the Project. It is anticipated, however, that partial revision of the EIA documents will suffice and necessity of re-approval of the EIA is unlikely. Also, some additional land acquisition and resettlement must be undertaken for the Direct Ramp. However, since the additional area to be acquired is as small as one tenth of the area for W-1 and W-2, the additionally required efforts will not be significantly large.

However, as stated above, the Japanese ODA loan with an amount not more than JPY 10 billion will not be able to cover the cost for the construction of W-1, W-2 and the Direct Ramp planned in Case 3. Therefore, the Survey Team decided that the construction of TgPA Case 3 will be completed by implementing three separate packages in parallel, namely;

- **Phase 3** assumes that project cost will be within JPY 10 billion and viaducts will be available for the toll road; the Phase 3 section will be from the Kp Bahari Ramp to the end of W-2 with a length of 2.1 km and will be funded from the TgPA Project Phase 3

component of the Japanese ODA loan (The W-1 and W-2 sections were divided into two at the location of the only ramp in the area; the western subsection was assigned under the Japanese ODA loan considering the project quantities.)

- **Phase 4** section will be from the start of W-1 to the Kp Bahari Ramp with a length of 3.5 km and implemented from unidentified funds, and

- **Direct Ramp** will be funded by the TgPA Project Phase 2 component of the Japanese ODA loan.

7.3 Examination of Applicability of PPP Scheme for O&M

7.3.1 Scope of Examination

The basic scope of examination is as follows:

(i) Examination will be conducted for the option which has been selected based on the economic and financial evaluation;

(ii) Construction of the road infrastructure of W-1, W-2 and the Direct Ramp will be funded by GOI mainly utilizing ODA loan. Thus, the O&M concession, in which the private concessionaire is not obliged to make any investment for the road infrastructure, will be the basic scheme for PPP application.

(iii) Examination will cover the overall O&M for all sections including those already funded such as E-1, E-2, E2A, and NS Link, and those to be funded, namely: W-1, W-2 and Direct Ramp.

7.3.2 Issues to be Examined

ITS/TSS are excluded for the examination and the Integrated Toll System for JORR is the premise for examination. At the same time TgPA is assumed to put on tender as a independent and separate section.

The following criteria are selected for setting up PPP options as major risks to be transferred to private sector:

1) Monetization (Upfront License Fee)

Since the investment for constructing the road infrastructure will be funded by GOI, the amount of investment which the private concessionaire would assume will be very small and minimal. Therefore, depending on the structure of the PPP scheme, there may be cases in which monetization of the future cash flow of the Project is necessary so that the monetized

(calculated) value could be paid by the private sector concessionaire to GOI, e.g., via BPJT as a form of upfront license fee payment.

2) Investment Risk

If the investment for constructing the road infrastructure is excluded, the remaining investment responsibility of the private sector concessionaire will be for the construction of toll booths and equipment, installation of telecommunication facilities and equipment, and procurement of necessary maintenance vehicles and equipment. This investment risk could vary from taking the initial investment risk of these facilities only with no renewal responsibility to a scheme in which the private sector concessionaire would assume the investment risk of both capital and renewal or rehabilitation costs of these facilities including future overlay and repainting costs during the concession period.

3) Revenue Risk

Revenue risk could be treated in various ways from a simple O&M concession based on performance with no revenue risk assumed by the private sector concessionaire to a scheme in which the private sector concessionaire would take both upside profit and downside risks of revenue.

7.3.3 Option Setting for Evaluation

Based on the above discussion of major issues and major risks which could be transferred to the private sector, three PPP options are considered for examination. The options are set on the basis of the extent of risk transfer for monetization, investment risk and revenue risk as shown in Table 7.2.

Option 1 is a long term O&M contract on the performance basis with no upfront license fee payment and no obligation of investment for renewal. Therefore, the risk transfer to the private sector would be minimal.

Option 2 is a hybrid option with upfront monetization of future cash flow and revenue risk sharing between the public and private sectors. Renewal risk will be assumed by the private sector.

Option 3 is a full monetization option in which the private sector would pay full upfront license fee based on the value of future cash flow of the Project and take all the risks pertaining to the O&M of the TgPA section.

Table 7.2 Setting up PPP Options

		Monetization (Up-Front License Fee)	Investment Risk	Revenue Risk
Small Risk Transfer to Private Sector Large	**Option 1** Performance O&M Contract Option	• No Monetization, but all revenue goes to public sector	• Investment of Toll Equipment with No renewal obligation (Renewal by public sector)	• Performance O&M contract by Cost + Fee, but all surplus revenue goes to public sector
	Option 2 Hybrid Option	• Medium Up Front License Fee	• Investment of Toll Equipment + Renewal Investment	• Up side revenue share • Down side deficit cover
	Option 3 Full Monetization Option	• Full Up Front License Fee Only	• Investment of Toll Equipment + Renewal Investment	• All Revenue Risk is covered by private sector

Source: SAPI Study Team

7.3.4 Evaluation of Options

(1) Evaluation Criteria

Three options are evaluated based on the following criteria:

(i) Financial viability for private sector (assumption for profitability);

(ii) Risk transfer and private sector participation (both from private and government view points);

(iii) Suitability to current regulatory framework;

(iv) Public fund availability; and

(v) Value for money and benefit to public sector.

(2) Assumption of Private Sector Financial Viability

The private sector financial viability of each option is evaluated based on the following assumptions:

(i) Special purpose company (SPC) for investment, operation and maintenance is established;

(ii) Cash flow model is prepared for each option;

(iii) Concession period is set at 30 years (excluding construction period);

(iv) Assessment indicators are as follows:

- Internal rate of return on equity (equity IRR): the hurdle rate is set at 18.0%
- Internal rate of return on total project cost (project IRR)
- Annual debt service coverage ratio (DSCR)
- Loan life coverage ratio (LLCR)
- Net present value of cash flow (NPV)
- Cumulative net cash flow

Based on the abovementioned assumptions, a financial model is prepared. Using the model, the financial viability for private sector of the three options is evaluated. In Option 1 (Long-term O&M Contract), the PPP concessionaire enters into a long-term O&M contract based on performance standards. It operates and maintains the TgPA section for a period of 30 years. The concessionaire makes investment on the initial construction of toll booths and other necessary facilities. Renewal of these facilities and all other necessary initial investments including the construction of W-1, W-2, and the Direct Ramp are conducted by the government. The concessionaire collects toll revenue and deducts necessary expenses and profit under the O&M contract amounting to 2% of the annual revenue, and deposits the balance to the bank account specified by the government.

In Option 2 (Hybrid Option: Partial Monetization of Future Cash Flow and Risk Sharing between Public and Private), initial investment for the construction of W-1, W-2 and the Direct Ramp is conducted by the government. On the other hand, the private sector concessionaire pays the government an upfront license fee and in return gets a government guarantee of 50% compensation on net cash deficiency (downside risk cover) in the beginning years and profit sharing (upside potential sharing) of net cash flow during whole concession period. Assuming the abovementioned upfront license fee payment of the concessionaire consists of 30% equity and 70% loan, financial viability of the Project is evaluated.

In Option 3 (Full Monetization Option: License Fee of Whole Future Cash Flow and Full Risk Taking by Private Sector), initial investment for the construction of W-1, W-2 and the Direct Ramp is conducted by the government. On the other hand, the concessionaire pays an upfront license fee and at the same time, the concessionaire takes all major project risks such as cash

flow deficiency risk and traffic forecast risk (uncertainty of traffic forecast level becoming far lower than expected).

(3) Overall Evaluation

The summary of the above-described evaluation is shown in the following Table 7.3. A means excellent, B means good and C means fair.

As a result of the overall evaluation, Option 1 is rated very low Option 2 and Option 3 are comparable and it is difficult to differentiate between the two options. Thus, for financial viability of Options 2 and 3, a sensitivity analysis is conducted for the most influential project risk, which is the traffic forecast risk, assuming that the actual realized traffic continues to be considerably lower than the forecasted level.

Table 7.3 Overall Evaluation of Three Options

	Private Sector Financial Assumption	Private Sector	Public Sector				Evaluation
		Risk Transfer	Risk Transfer	Fitting for Framework	Public Fund Availability	VFM	
Option 1 Long Term O&M Contract	• D/E: 70%:30% (same for all cases) • License Fee is Zero • Project IRR: 16.9% • Equity IRR: 18.0% • Ave DSCR: 1.47 • LLCR: 1.90	• Smallest Risk Transfer **A**	• Smallest Risk Transfer **C**	• Possible as conducted for Sura-Madu Bridge **B**	• Need to prepare additional public funding **C**	• NPV of Govt CF: -1,820 B Rp (-18.3 B JPY) • PI of Above: 0.59 **C**	**C**
Option 2 Hybrid Option	• License Fee of 2,372 B Rp (23.9 B JPY) • CF Deficit Compensation and Profit Sharing • Project IRR: 15.6% • Equity IRR: 18.0% • Ave DSCR: 1.63 • LLCR: 2.04	• Medium Risk Transfer • Risk Hedging Mechanism and Private Sector Participation Possible **B**	• Medium Risk Transfer **B**	• PPP Framework is already Prepared • Special Account Mechanism Needed for Bina Marga **B**	• Large up front license fee is available **B**	• NPV of Govt CF: -1,562 B Rp (-15.8 B JPY) • PI of Above: 0.55 **A**	**A**
Option 3 Full Monetization Option	• License Fee of 2,881 B Rp (29.1 B JPY) • Project IRR: 15.8% • Equity IRR: 18.0% • Ave DSCR: 1.63 • LLCR: 2.12	• Largest Risk Transfer • Detailed Assessment of Project Risks is Necessary for Private Sector Participation **C**	• Largest Risk Transfer **A**	• PPP Framework is already Prepared • Special Account Mechanism Needed for Bina Marga **B**	• Large up front license fee is available **A**	• NPV of Govt CF: -1,929 B Rp (-19.5 B JPY) • PI of Above: 0.45 **C**	**B**

Legend; A: Excellent, B: Good, C: Fair

Source: SAPI Study Team

Financial viability of the two options is assessed assuming that only 70% of the forecast level traffic is realized during the whole concession period. The equity IRR goes down from 18% to

13% level, but there is no significant difference between the two options. On the other hand, the cumulative net cash flow deficiency of Option 2, with the risk hedging mechanism for cash flow deficiency, amounts to a maximum of Rp 345 billion (roughly equal to JPY 3.5 billion) while that of Option 3, without such mechanism, accumulates to a maximum of Rp 857 billion (roughly equal to JPY 8.6 billion). Moreover, 13 years is required for clearing the deficit under Option 3.

7.3.5 Recommendation

As illustrated by Option 3, there is a tendency for the Indonesian government to make unconditional transfer of project risks to the private sector in PPP toll road projects in the past. Therefore, there has been a very limited number of PPP toll road projects that materialized.

A mechanism to address such problem is proposed in Option 2. Preliminary assessment of financial viability implied effectiveness of this idea. As a result, it is recommended to consider adopting Option 2 for the O&M concession arrangement.

When implementing this option, thorough market sounding of major project risks must be conducted by the government to the related players including financial institutions. Also, it is recommended for the government to implement a PPP tender based on the result of such market sounding.

7.4 Applicability of PPP Scheme to Future Phases

Taking W-1, W-2 and the Direct Ramp as the subjects for investment, analysis is conducted to assess how much initial investment could the private sector concessionaire could shoulder. Assumptions are same as in the previous section, i.e., the private sector concessionaire would conduct O&M for the entire TgPA section consisting of E-1, E-2, NS Link, W-1, W-2 and Direct Ramp. Other conditions are similar as in Option 2 (Hybrid Option).

As shown in Table 7.4, financial viability of the private sector investment is assumed by changing the private sector investment contribution for W-1, W-2 and Direct Ramp from 100% to 0% (the initial investment for the toll stations and so on is still the obligation of the private sector).

As a result, a private sector contribution of 44% (i.e., 56% by the government) of the total investment is determined as the threshold value, which is the level that will make the equity IRR equal to 18.0% for the private sector investment. In other words, when the required rate of return for the private sector is 18%, the private sector, considering

Option 2, could shoulder as much as 44% of the initial investment for W-1, W-2 and the Direct Ramp.

Table 7.4 Possibility of Private Sector Investment for Construction

	Investment of W1, W2, DR		PIRR	Equity IRR	Ave DSCR	Max Deficit (B Rp)
	Private	Public				
1	100%	0%	10.5%	9.6%	0.97	-1,214
2	90%	10%	11.1%	10.5%	1.03	-922
3	80%	20%	11.8%	11.6%	1.11	-674
4	70%	30%	12.6%	12.9%	1.21	-459
5	60%	40%	13.6%	14.6%	1.33	-277
6	50%	50%	14.8%	16.6%	1.50	-130
7	44%	56%	15.6%	18.0%	1.63	-59
8	40%	60%	16.3%	19.3%	1.74	-24
9	30%	70%	18.5%	23.2%	2.14	0
10	20%	80%	22.0%	29.9%	2.91	0
11	10%	90%	29.5%	45.4%	5.03	0
12	0%	100%	169.7%	514.9%	35.23	0

Source: SAPI Study Team

7.5 Estimate of Project Cost

The construction and consulting services costs for the above-selected implementation plan for TgPA Project Phase 3 are as shown in Table 7.5 below.

Table 7.5 Estimated Construction and Engineering Service Costs for TgPA Phase 3

	Amount(JPY Million)	Remarks
Construction Cost		
Base Cost	7,438	JPY 7,438 Mil for Phase 3 of W-2
Price Escalation	1,772	F/C:1.8% p.a. of Base Cost
		L/C:7.9% p.a. of Base Cost
Physical Contingency	372	5% of Base Cost
Consulting Services		
Base Cost	743	Phase3(2.1km)
Physical Contingency	74	10% of Base Cost
Total	10,399	

The Project cost, inclusive of the whole Project components, to be applied for a Japanese ODA loan is summarized as shown in Table 7.6.

Table 7.6 Estimated Project Cost for TgPA Project Phase 3

		F/C L		/C		Total		
		Total (1000 JPY)	Loan Eligible Portion (1000 JPY)	Total (Mill Rp.)	Loan Eligible Portion (1000 JPY)	(1000 JPY)	(Mill Rp.)	Loan Eligible Portion (1000 JPY)
Items								
1	Construction 2,	231,349	2,231,349	515,493	5,206,482	7,437,831	736,419	7,437,831
2	Procurement							
3	Price Escalation for Construction	146,299	146,299	160,937	1,625,463	1,771,762	175,422	1,771,762
4	Physical Contingency for Construction	111,567	111,567	25,775	260,324	371,892	36,821	371,892
5	Consulting Services	511,600	511,600	22,952	231,815	743,415	73,605	743,415
6	Physical Contingency for Consultant	51,160	51,160	2,295	23,182	74,342	7,361	74,342
7	Interest During Construction	9,767	9,767	2,688	27,149	36,915	3,655	36,915
8	Commitment Charge	9,175	9,175	2,240	22,623	31,799	3,148	31,799
9	Land Acquisition		123	,645	1,2	48,816	123,645	
10	Administration Cost	152,599	36,	373	519	,962	51,481	
11	Tax (VAT)	305,198	72,	745	1,0	39,924	102,963	
Total 3,5		28,715	3,070,918	965,143	7,397,037	13, 276,657	1,314,521	10,467,955

7.6 Implementation Structure

For Phase 3 of the TgPA Project, Bina Marga, as the employer, will procure a consultant to implement the D/D revision, tender assistance, and construction supervision. The contractors to be procured through the ICB process will undertake the construction. The completed road will be opened to traffic under a PPP (or O&M) concession contract between BPJT and an operator to be in charge of either a single independent TgPA or an integrated TgPA and JORR.

7.7 Implementation Program

Phase 3 of the TgPA Project will be adopted as a Japanese ODA loan for Fiscal Year 2011. After the appraisal of JICA in November 2010, the loan agreement will be signed between JICA and GOI in March 2011. The proposed implementation schedule is as shown in Figure 7.1.

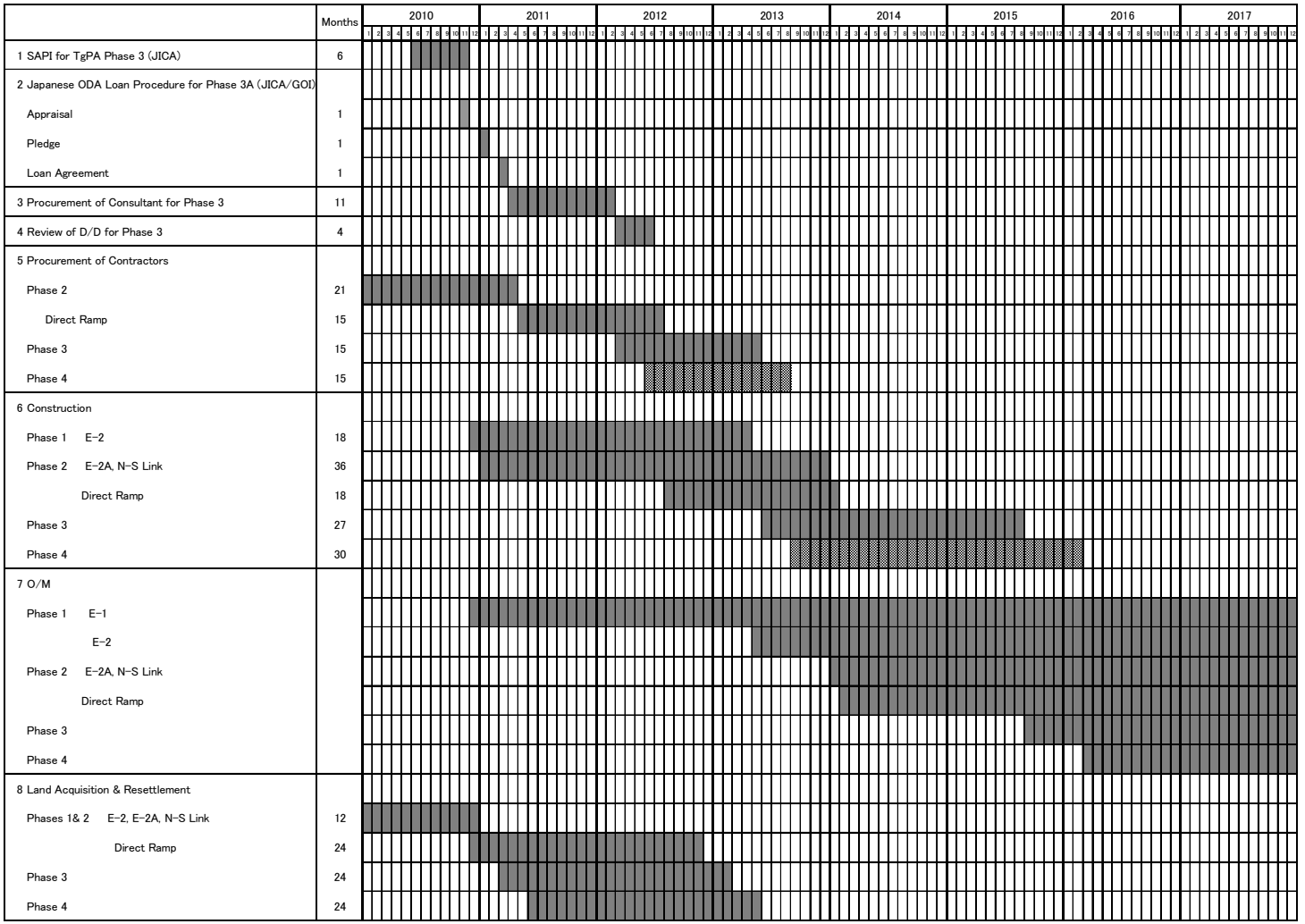


Figure 7.1 Proposed Implementation Schedule

CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS

Major conclusions and recommendations derived from the Survey are as follows:

- The program for the Direct Ramp, which was planned by Bina Marga in anticipation of the delay of the completion of W-1 and W-2, has been undecided so far. In this Survey, however, it was decided that the Direct Ramp should be considered as a component of Phase 2 of the Project.

- For traffic demand forecast, some revisions were made on past forecasts. Supplementary traffic surveys were actually carried out to clarify the actual traffic flows in the Tanjung Priok Port area, car users' stated preference for TgPA, and travel times from/to Tanjung Priok Port. Basically, the future traffic demand was forecasted for the following cases: (a) with W-1 and W-2 only, (b) with Direct Ramp only, and (c) with all of these sections to be constructed.

- Since the total traffic demand in the network is relatively stronger than the network capacity, some links have an imbalanced network flow, i.e., there are some very heavily traveled links while there are also some lightly traveled links. Consequently, construction of W-1 and W-2 sections as well as addition of the Direct Ramp is justified from the viewpoint of network traffic flow.

- Through the review of the road design, alternative designs were investigated for the adjustment of the pier locations with the completed improvement of the roads in the port area, and change of superstructure from the PC box girders to PCU girders. As a result of this review, the construction cost will be reduced by Rp 142 billion in total. However, the cable-stayed bridge seems to be selected during the D/D stage for aesthetic and landmark reasons. Thus, considering limited Indonesian national finance, the Survey Team suggests that the cable-stayed bridge type should be re-examined in Phase 3 taking into account the construction cost including approach bridges and safety during construction.

- The review provided the construction costs for W-1, W-2, and Direct Ramp sections as Rp 1,475 billion, Rp 1,087 billion, and Rp 200 billion, respectively.

- The area of land to be acquired for the new TgPA Project is 32,898 ㎡ in total, comprising of 4,334 ㎡, 24,606 ㎡, and 3,958 ㎡ for W-1, W-2, and Direct Ramp, respectively. The remaining area to be acquired for Phases 1 and 2 is 128,988 ㎡.

- The EIA for the TgPA Project was originally conducted based on the F/S by JETRO in 2004 and approved in December 2004. As a result of the comparison between F/S and D/D implemented in 2007 and 2008, respectively, it was confirmed that there are no major differences in the design, location and magnitude of the Project, except for the addition of the construction of the Direct Ramp. However, the area for the location of the Direct Ramp had already been covered and studied in the original EIA. Furthermore, since the 1.15 km long Direct Ramp does not exceed 5 km, as prescribed in a Ministry of Environment (MOE) decree, a new EIA may not be required.

- However, if the scope of a project is changed after the approval of the EIA, the EIA documents including ANDAL, RKL, and RPL should be revised through the review of the EIA and re-submitted for re-approval. After that, MOE will take the next action.

- In this Survey, as a result of the overall evaluation of costs, traffic volumes, economic impacts, viability as a toll road, etc., Case 3 is selected as the best alternative for Project implementation. However, the amount of the Japanese ODA loan requested by GOI is limited to JPY 10 billion (US$120 million), which can cover a part of the total cost for W-1, W-2, and Direct Ramp. Thus, the Project is divided into three phases, namely: (a) Phase 3 for the partial W-2 section with length of 2.1 km to be funded under the TgPA Phase 3 component of the Japanese ODA loan, (b) Phase 4 for the partial W-1 and W-2 sections with length of 3.5 km to be funded from unidentified sources, and (c) Direct Ramp to be funded under the TgPA Phase 2 component of the Japanese ODA loan.

- The total project cost for Phase 3 is estimated at JPY 13,277 million, in which the eligible portion for the Japanese ODA loan is JPY 10,468 million.

- Applicability of the PPP scheme for the operation and maintenance (O&M) was examined by setting up options such as long-term O&M contract, full monetization, or hybrid, and evaluating the financial viability, risk transfer and private sector participation, suitability to current regulatory framework, and value for money and revenue to the public sector. As a result of the overall evaluation, the hybrid PPP scheme is judged to be the most realistic and practical.

- According to the proposed implementation schedule, after the loan agreement is signed in March 2011, the construction, which is funded under Japanese assistance, will start in December 2012 and will be completed in May 2015. The Direct Ramp will be opened to traffic in June 2014, while Phase 3 will start in June 2015.


ジャイカ
JICA