

**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

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

NOVEMBER 2010

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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

COMPOSITION OF FINAL REPORT

Main Report

Appendix 1 to 5

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

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	<p>(1) To review and examine the traffic demand forecast for the future years, reflecting the results of the traffic survey conducted,</p> <p>(2) To review and examine the cost estimate for W-1, W-2 and Direct Ramp ,</p> <p>(3) To develop and compare alternative project scopes for the completion of the TgPA network,</p> <p>(4) To study the applicability of the Public Private Partnership (PPP) to the operation and maintenance (O&M) of TgPA,</p> <p>(5) To examine the necessity for additional procedures, if any, for social and environmental considerations and their extent, and</p> <p>(6) To recommend an optimal project implementation scheme, based on the traffic demand, project cost and project effects.</p>
5. Study Area	Jakarta Metropolitan Area
6. Scope of Study	<p>(1) Re-confirm the present traffic volumes and develop alternatives to the project scope,</p> <p>(2) Develop project implementation plans,</p> <p>(3) Review and prepare for the social and environmental considerations,</p> <p>(4) Calculate the project effects, and</p> <p>(5) Propose an optimal alternative.</p>
7. Major Findings	<p>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..</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>The area of land to be acquired for the new TgPA Project is 32,898 m² in total, comprising of 4,334 m², 24,606 m², and 3,958 m² for W-1, W-2, and Direct Ramp, respectively.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
8. Conclusions and Recommendations	<p>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.</p>

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

Final Report

Table of Contents

Location Map

Synopsis

Table of Contents

List of Abbreviations

CHAPTER 1	INTRODUCTION	1-1
1.1	Backgrounds of the Survey	1-1
1.2	Objectives of the Survey	1-1
CHAPTER 2	OVERVIEW OF THE TGPA PROJECT	2-1
2.1	Backgrounds of TgPA Project.....	2-1
2.2	Outlines of TgPA Project Area.....	2-1
2.3	Objectives of the TgPA Project	2-3
2.4	Current Footsteps of the TgPA Project Implementation	2-3
CHAPTER 3	REVIEW OF TRAFFIC DEMAND FORECAST	3-1
3.1	Review of Existing Traffic Demand Forecast.....	3-1
3.2	Supplementary Traffic Survey	3-3
3.3	Examination of Newly Emerged Development Plans Affecting Traffic Demand.....	3-19
3.4	Development of Alternative Traffic Demand Forecast Cases	3-25
3.5	Update of Traffic Demand Forecast	3-25
CHAPTER 4	REVIEW OF ROAD DESIGN AND COST ESTIMATE	4-1
4.1	Review of Existing Road Designs and Recommendations of Alternatives	4-1
4.2	Examination of Cost Reduction through Alternative Designs.....	4-7
4.3	Update of Construction Cost	4-8
4.4	Estimate of O&M Cost.....	4-11

CHAPTER 5	ESTIMATION OF PROJECT EFFECTS	5-1
5.1	Economic and Financial Valuation	5-1
5.2	Estimation of Performance Indicators.....	5-8
CHAPTER 6	STUDY ON SOCIAL AND ENVIRONMENTAL CONSIDERATIONS	6-1
6.1	Confirmation of Policy and Schedule for Land Acquisition and Resettlement for Precedent TgPA Sections	6-1
6.2	Confirmation of Social and Environmental Requirements.....	6-4
CHAPTER 7	ALTERNATIVE PROJECT IMPLEMENTATION PLANS	7-1
7.1	Development of Alternative Project Scopes	7-1
7.2	Recommended Optimal Implementation Plan.....	7-3
7.3	Examination of Applicability of PPP Scheme for O&M	7-4
7.4	Applicability of PPP Scheme to Future Phases	7-14
7.5	Estimate of Project Cost.....	7-15
7.6	Implementation Structure	7-18
7.7	Implementation Program.....	7-18
CHAPTER 8	CONCLUSIONS AND RECOMMENDATIONS	8-1

List of Table

Table 2.1	Summary of Japanese ODA Loan Agreements for TgPA	2-4
Table 2.2	Summary of Repackaging	2-6
Table 3.1	Survey location of traffic count survey	3-3
Table 3.2	24 hour sectional Traffic Volume by each direction, each mode	3-5
Table 3.3	List of location place of car user interview	3-9
Table 3.4	Utilization rate of TgPA for through traffic in Jakarta Urban Area	3-14
Table 3.5	List of Travel time survey route	3-15
Table 3.6	Average Travel Time of Surveyed Route	3-16
Table 3.7	GRDP and Per Capita GRDP on D KI Jakarta at 2000 Constant Market Prices	3-19
Table 3.8	Forecast of Port Related Traffic by Vehicle Type	3-22
Table 3.9	Traffic Generation and Attractive by Zones	3-23
Table 3.10	Cas es for Demand Forecast	3-25
Table 3.11	Com parison of total tariff income	3-29
Table 3.12	Assignment result by alternative case and by toll road section	3-31
Table 4.1	Summary of Original Structures	4-1
Table 4.2	Structures to be modified	4-2
Table 4.3	Estimated Cost Reduction for applying PC-U Girders	4-3
Table 4.4	Topographic Survey Results of Jl.Martadinata	4-6
Table 4.5	Sum mary of Cost Reduction	4-7
Table 4.6	U nit Prices of Labor	4-9
Table 4.7	U pdated Construction Cost	4-10
Table 4.8	Land Acquisition Cost Estimation	4-11
Table 4.9	O &M Estimation Method	4-11
Table 4.10	U nit Maintenance Cost Estimation	4-12
Table 4.11	Maintenance Cost of Each Section	4-12
Table 4.12	U nit Operation Cost Estimation	4-13
Table 4.13	Operation Cost for Each Section	4-13
Table 4.14	Summary of Construction Cost of Operation Facilities	4-13
Table 4.15	Summary of O&M Cost	4-14

Table 5.1	Principal indices of cost effect analysis and their characteristics.....	5-1
Table 5.2	Com parison of the economic benefit.....	5-2
Table 5.3	Vehicle Operating Cost (As of 2005)	5-3
Table 5.4	Calculation of estimated value of time.....	5-4
Table 5.5	V aluation results of the economic benefit.....	5-5
Table 5.6	Cons truction cost (The economic price)	5-5
Table 5.7	Repa iring cost (Economic price)	5-6
Table 5.8	M aintenance and operating cost (Economic price)	5-6
Table 5.9	Economic evaluation results of TgPA	5-6
Table 5.10	Sensibility analysis of the economic valuation (EIRR)	5-7
Table 5.11	The result of the financial valuation.....	5-8
Table 5.12	Estimation of Performance Indicators (Traffic Volume).....	5-9
Table 5.13	Estimation of Performance Indicators (Travel Time from Tanjung Priok Port)	5-9
Table 6.1	Status of Project Development and Land Acquisition.....	6-1
Table 6.2	Land to be Acquired for TgPA Project (Unit: m ²)	6-4
Table 6.3.1	Data of Land Acquisition in Direct Ramp Area.....	6-5
Table 6.3.2	Data of Land Acquisition in NS Link Area (Private Sector).....	6-6
Table 6.4	Sections Covered by 2004 EIA.....	6-7
Table 6.5	Comparison of F/S and D/D from Viewpoint of Environmental Consideration	6-8
Table 6.5.1	Administrative Border of TgPA Project (per F/S).....	6-8
Table 6.5.2	Administrative Border of TgPA Project (per D/D)	6-8
Table 6.5.3	Comparison of Project Scope between F/S and D/D.....	6-9
Table 6.5.4	Area of Land Acquisition Required as of F/S (m ²)	6-10
Table 6.5.5	Area of Land Acquisition Required as of D/D (m ²).....	6-10
Table 6.5.6	Number of Affected Household.....	6-11
Table 7.1	A ttributes of Alternative Project Scopes	7-2
Table 7.2	Se tting up PPP Options	7-7
Table 7.3	Overall Evaluation of Three Options	7-13
Table 7.4	Possibility of Private Sector Investment for Construction.....	7-15
Table 7.5	Estimated Construction and Engineering Service Costs for TgPA Phase 3...	7-15
Table 7.6	Estimated Project Cost for TgPA Project Phase 3.....	7-17

List of Figure

Figure 2.1	Toll Road Network Planned in Jakarta Metropolitan Area.....	2-2
Figure 2.2	Original Package Plan for TgPA.....	2-5
Figure 2.3	Repackaged Plan for TgPA.....	2-5
Figure 3.1	Traffic Volume Forecast (CASE-2 in 2020).....	3-1
Figure 3.2	Traffic Volume Forecast (CASE-2 in 2030).....	3-2
Figure 3.3	Traffic Volume Forecast (CASE-3 in 2030).....	3-2
Figure 3.4	Traffic Count Survey Location point.....	3-4
Figure 3.5	Time Fluctuation by Direction	3-6
Figure 3.6	Traffic Volume Comparison of 2007, 2009, and 2010 (All w/o motorcycle)	3-8
Figure 3.7	Traffic Volume Comparison of 2007, 2009, and 2010 (Freight)	3-8
Figure 3.8	Stated Preference Survey Location.....	3-9
Figure 3.9	Ratio of toll road route to the Tanjung Priok Port and surrounding area	3-10
Figure 3.10.1	Future toll road user preference to western facility of Tanjung Priok port and surrounding facility	3-12
Figure 3.10.2	Future toll road user preference to eastern facility of Tanjung Priok port and surrounding facility	3-13
Figure 3.11	Travel time survey route.....	3-15
Figure 3.12	Travel speed of Morning Peak (Inbound).....	3-17
Figure 3.13	Travel speed of Morning Peak (Outbound).....	3-17
Figure 3.14	Travel speed of Midday non Peak (inbound)	3-18
Figure 3.15	Travel speed of Midday non Peak (Outbound)	3-18
Figure 3.16	Transition of No. of Registered Vehicles.....	3-19
Figure 3.17	Daily Traffic Volume of Toll Road	3-20
Figure 3.18	Development Plan of Ancol Timur	3-21
Figure 3.19	Location of Ancol Development	3-22
Figure 3.20	Zoning of East Pantura Reclamation Area	3-23
Figure 3.21	KBN Marunda SEZ Development Plan.....	3-24
Figure 3.22	Road Network around Ancol Development Area	3-24
Figure 3.23	Assignment Traffic Volume (Base Case – Year 2016).....	3-26
Figure 3.24	Assignment Traffic Volume (Case 1 – Year 2016).....	3-26
Figure 3.25	Assignment Traffic Volume (Case 2 – Year 2016).....	3-27
Figure 3.26	Assignment Traffic Volume (Case 3 – Year 2016).....	3-28

Figure 3.27	Assignment Traffic Volume (Case 4 – Year 2016).....	3-29
Figure 3.28	Assignment Volume Result (Case 5 – Year 2016)	3-30
Figure 4.1	Location of Viaduct-5,7 and Cable Stayed Bridge	4-2
Figure 4.2	Cross Section of PC-box and PC-U	4-3
Figure 4.3	Original Ancol IC Alignment	4-4
Figure 4.4	Recommended Ancol IC Alignment	4-5
Figure 4.5	Plan of Pasoso Flyover and TgPA.....	4-5
Figure 4.6	Modification of Pier-10 of W-1 Section.	4-7
Figure 4.7	Cost Estimate Review Procedure.....	4-8
Figure 4.8	Price Hike of Construction Materials	4-8
Figure 5.1	Sensitivity analysis of the financial valuation (FIRR)	5-8
Figure 6.1	Procedure of Land Acquisition for the Implementation of Public Facility Development.....	6-3
Figure 6.2	Actions Required for Bina Marga for Environmental Approval.....	6-14
Figure 7.1	Implementation Structure	7-18
Figure 7.2	Proposed Implementation Schedule	7-20

List of Abbreviations

AMDAL	EIS, Environmental Impact Statement
ANDAL En	Environmental Impact Assessment Report
BOT B	Build Operate Transfer
BPJP	National Long-term Development Plan
BPJT Hi	Highway Controller Agency
BPKP	Finances Monetary Agency and Development
CMNP	Citra Marga Nusaphala Persada Company
D/D De	Detailed Design
DGH	Directorate General of Highways
DKI	Special Capital City District
DSCR	Debt Service Cover Ratio
EIA E	Environmental Impact Assessment
EIRR	Economic Internal Ratio of Return
ETC El	Electronic Toll Collection
F/C For	Foreign Currency
FIRR F	Financial Internal Ratio of Return
F/S Fe	Feasibility Study
GDP	Gross Domestic Product (of the nation)
GOI G	Government of Indonesia
GRDP	Gross Regional Domestic Product (of the region)
IC I	Interchange
ICB I	International Competitive Bidding
IDR I	Indonesian Rupiah
IMF In	International Monetary Fund
IRR	Internal Rate of Return
ITS I	Intelligent Transportation System
JCT J	Junction
JETRO	Japan External Trade Organization
JIUT J	Jakarta 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	Indonesia 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 through 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.

In consideration of the intentions of both Bina Marga as the implementing agency and JICA as the donor, the objectives of the Survey are summarized more specifically as follows;

- 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 of 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.

CHAPTER 2 OVERVIEW OF THE TGPA PROJECT

2.1 Backgrounds of TgPA Project

Since the economic structure reforms agreed with IMF in 1997, Indonesia has been maintaining a sound economic growth, achieving around 6% per annum (p.a.) since 2005. In 2009, GDP per capita reached US\$2,950, which has doubled from the US\$1,283 in 2005. This was propelled by such policies as financial business stabilization, economic stimulation, etc. and the steady domestic consumption.

GOI has been facing the challenges to address the insufficiency of infrastructure, which potentially hinders national economic growth. It 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. The current plan is 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 (Daerah Khusus Ibukota Jakarta), with a population of 7.8 million, and its neighboring satellite cities. The metropolis is one of the most rapidly urbanizing areas in the world, with a population growth that maintained an annual rate of 3.0% from 2001 to 2005. Currently, the population in the region is 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, which has serious negative impacts to the social and economic

activities in the area and of the country.

One of the major traffic origins/destinations in the area is the Tanjung Priok Port located in the north of Jakarta, 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. The amount of loaded/unloaded container cargoes has increased remarkably by 1.8 times from 2.30 million TEU in 2001 to 4.00 million TEU in 2008.

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 and 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.

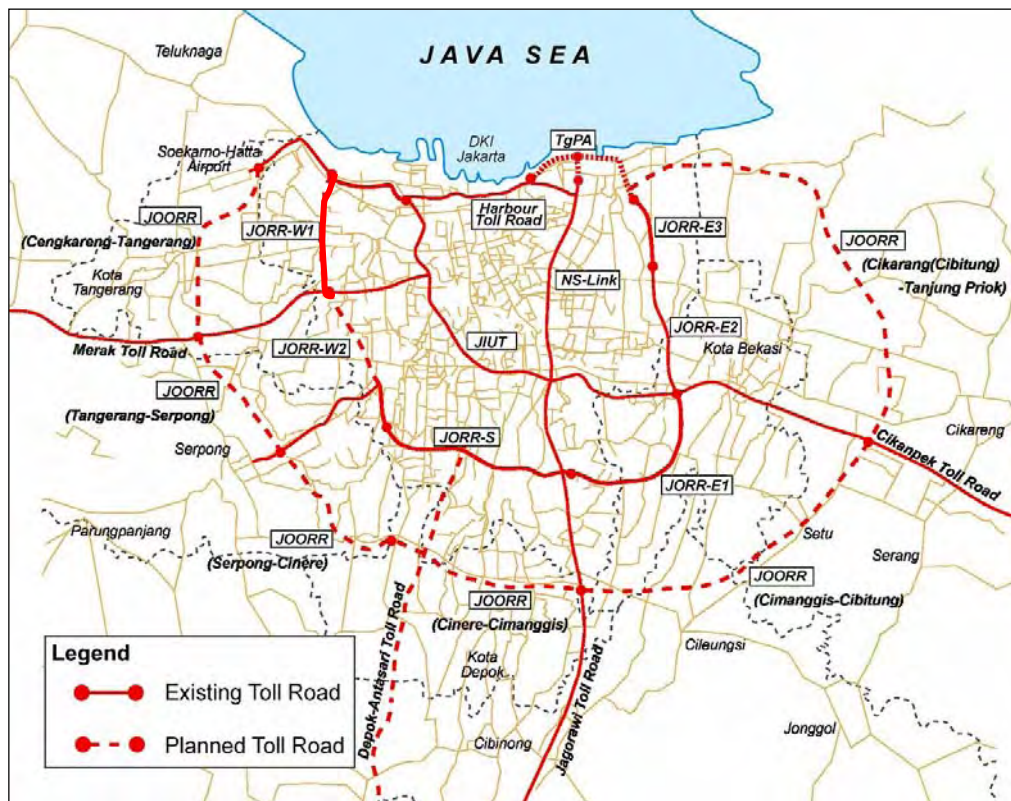


Figure 2.1 Toll Road Network Planned in Jakarta Metropolitan Area

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 consideration of the importance of TgPA, highly prioritized in SITRAMP, GOI requested JETRO for the implementation of a feasibility study (F/S). In January 2004, JETRO completed the F/S 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

In response to the request of GOI for fund assistance for the construction of TgPA 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

In January 2007, the executing agency, Bina Marga, procured a consultant for Phase 1 to undertake the D/D for all sections namely, E-1, E-2, N S-Link, W-1, and W-2, and the construction supervision for two sections namely, E-1 and E-2. The D/D was completed in December 2007.

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 in Figures 2.2 and 2.3, and 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.



Figure 2.2 Original Package Plan for TgPA



Figure 2.3 Repackaged Plan for TgPA

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; however, the decision to include the Direct Ramp has not yet been made by JICA and is still under consideration.

(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

(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.

Figure 3.1 shows the demand forecast results in 2020. The characteristics are as follows:

- ✓ Chronic congestion will occur similar to the present situation, although toll roads are fairly serviced.
- ✓ In TgPA, the east side (Rorotan Interchange to Koja East Interchange) will have more than 100,000 pcu/day traffic in 2020, while the west section and N-S Section traffic volume will have 66,000 pcu/day and 34,200 pcu/day.
- ✓ The TgPA project is expected to have positive impact in dispersing traffic on the toll roads in the Jakarta urban area, e.g. Jakarta Intra Urban Tollway (JIUT).

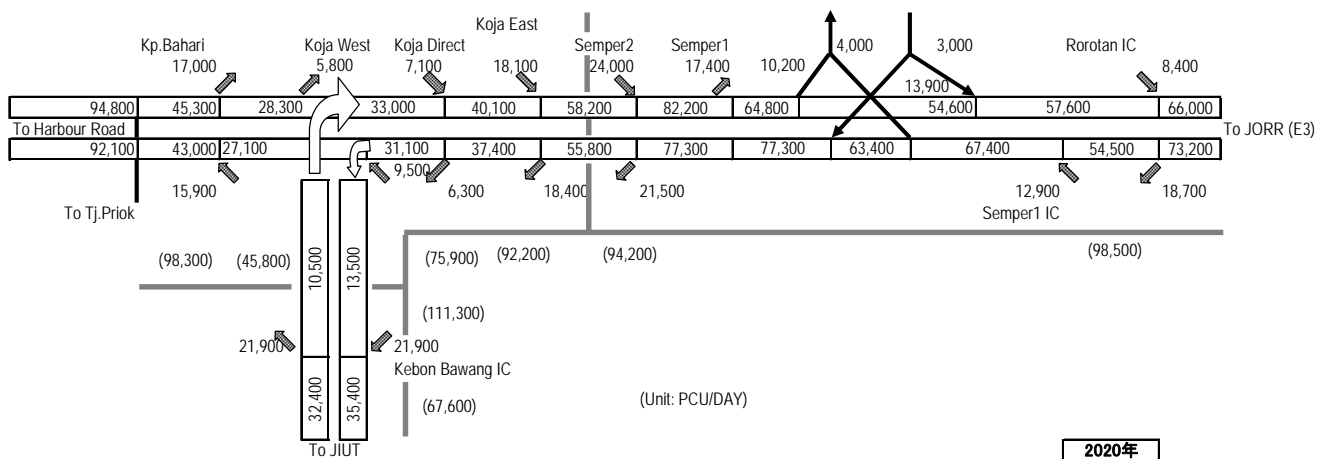


Figure 3.1 Traffic Volume Forecast (CASE-2 in 2020)

(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 N-S-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.

As a result, the capacity of the direct ramp without the construction of the west section of TgPA will be saturated as 6 2,500 pcu/2 lanes/day before 2022. Then, the construction of section the west section will be required before 2022.

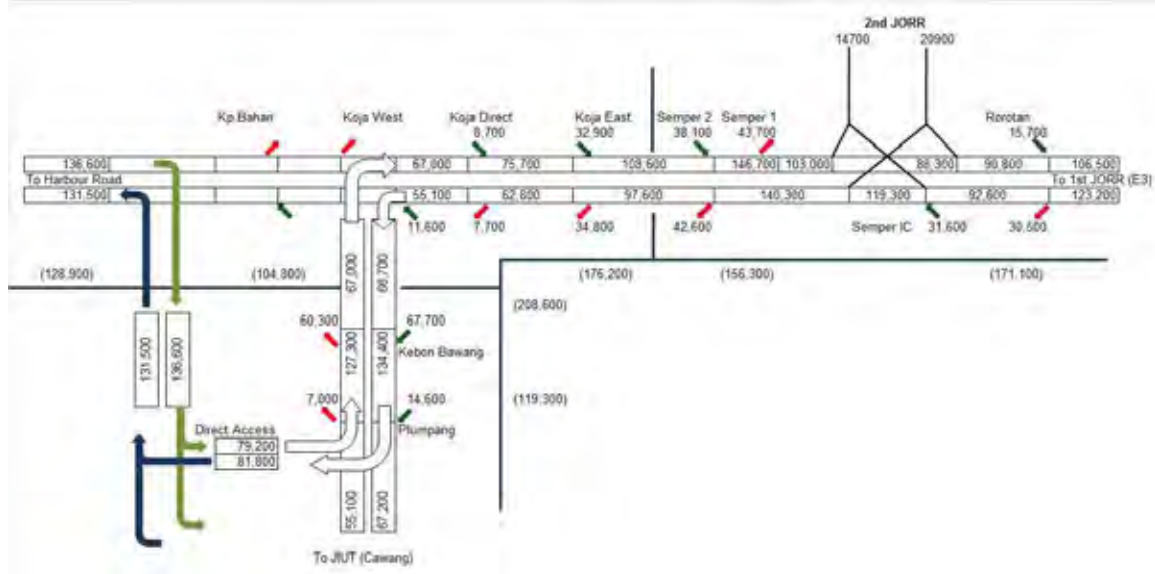


Figure 3.2 Traffic Volume Forecast (CASE-2 in 2030)

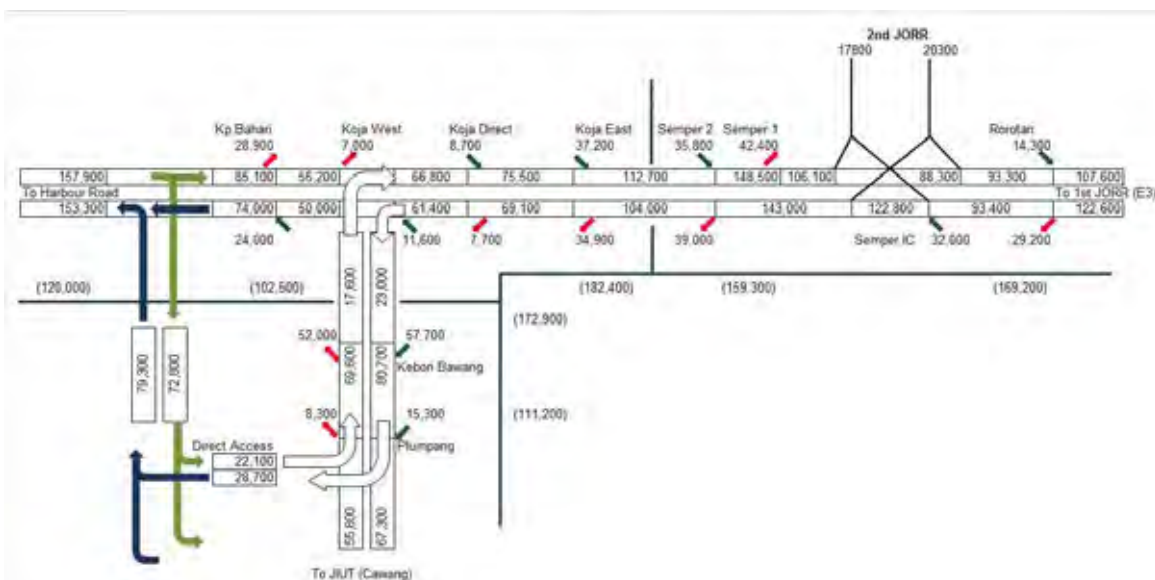


Figure 3.3 Traffic Volume Forecast (CASE-3 in 2030)

(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 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 as shown in Table 3.1 and Figure 3.4.

Table 3.1 Survey location of traffic count survey

Location No	(section of TgPA)	Street	Section	Remarks
CO-1	W-2	Laks. R. E. Martadinata	Ancol-Pos 1 gate	Arterial
CO-2 W	-1	Enggano	To Pos 8 gate	Arterial
CO-3	E-2A	Jampea	JICT gate – KOJA Gate	Arterial
CO-4	E-2	Jampea	KOJA Gate – Kramat Jaya	Arterial
CO-5	E-1	Cakung Cilincing	Toll barrier of Outer Ring Road	Highway + Arterial
CO-6	NS	Laks. Yos Sudarso	Toll barrier of N-S Link road	Highway + Arterial
CO-7	Direct ramp	Harbor road	Tanjung Priok Ramp (on/off)	Highway ramp

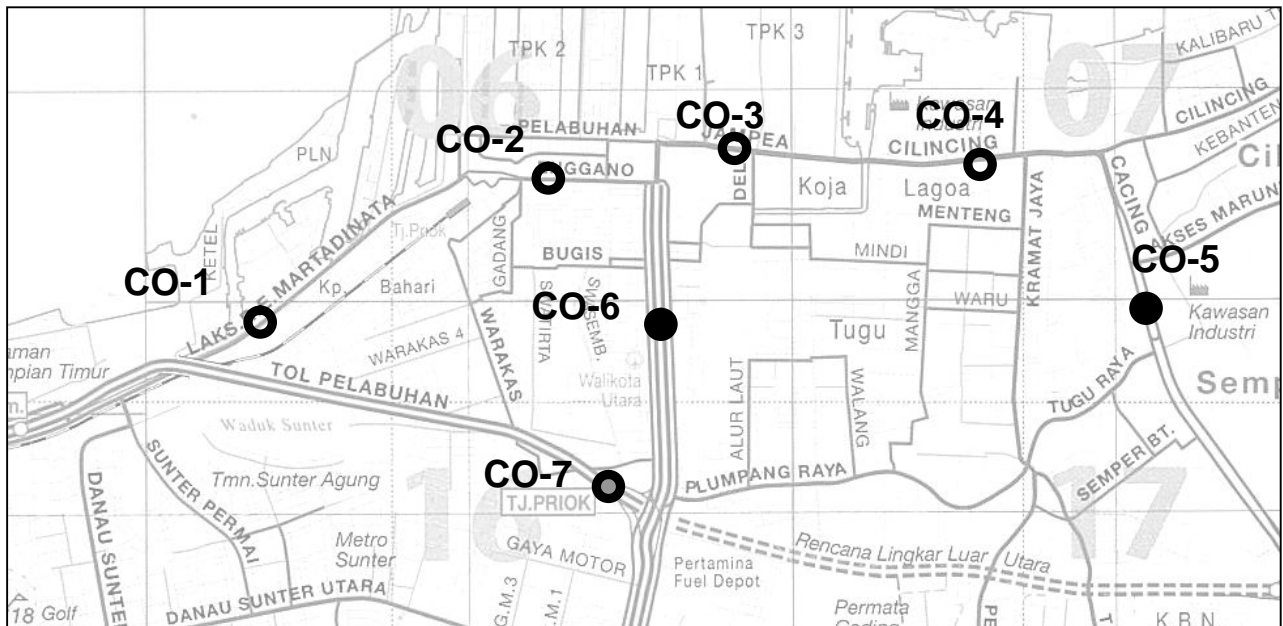


Figure 3.4 Traffic Count Survey Location point

(1) 24 hour traffic volume

Table 3.2 shows the traffic count 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 of f-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.

(2) Modal Composition

Modal composition of each point is also shown in Table 3.2. Modal composition of passenger car ratio is approximately 43% at CO-1, CO-2 and CO-5, and 33% at CO-3 and CO-4. Meanwhile, the ratios of CO-6 and CO-7 (Tanjung Priok Ramp) are 59.8 % and 58.6 % respectively, which are relatively higher than other location points. From the viewpoint of buses, the bus composition of Jl. Enganno (CO-2) is the highest at 40.4%. The bus composition of other points is from 5.1% to 20.3%. This is the lowest ratio among the three vehicle types.

From the viewpoint of trucks, the section of Sulawesi, Jember, Cilincing has the large

occupation by 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, ranging from 36.6% to 37.2%, while those of CO-1 and CO-2 are lower, ranging from 19.4% to 24.1 %.

(3) Time Fluctuation

Figure 3.5 shows the 24-hour time fluctuation of each survey point. The characteristics of each point are as follows:

CO-1, CO -2, C O-5: Two peak time (morning and evening), with same fluctuation at each direction

CO-3, CO-4: Two peak time (morning and evening). In the morning, west bound is the main traffic flow while in the evening, east bound for JORR is the main traffic flow.

CO-6: From 06:00 to 19:00 hrs, continuously high traffic volume is counted as more than 5,000 passenger car units (pcu).

CO-7: This ramp is mostly used from 11:00 to 16:00 hrs by approximately 2,500 pcu.

Table 3.2 24 hour sectional Traffic Volume by each direction, each mode

			TOTAL			Modal Composition			
			Without Motorcycl e(a)	With Motorcycl e(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%

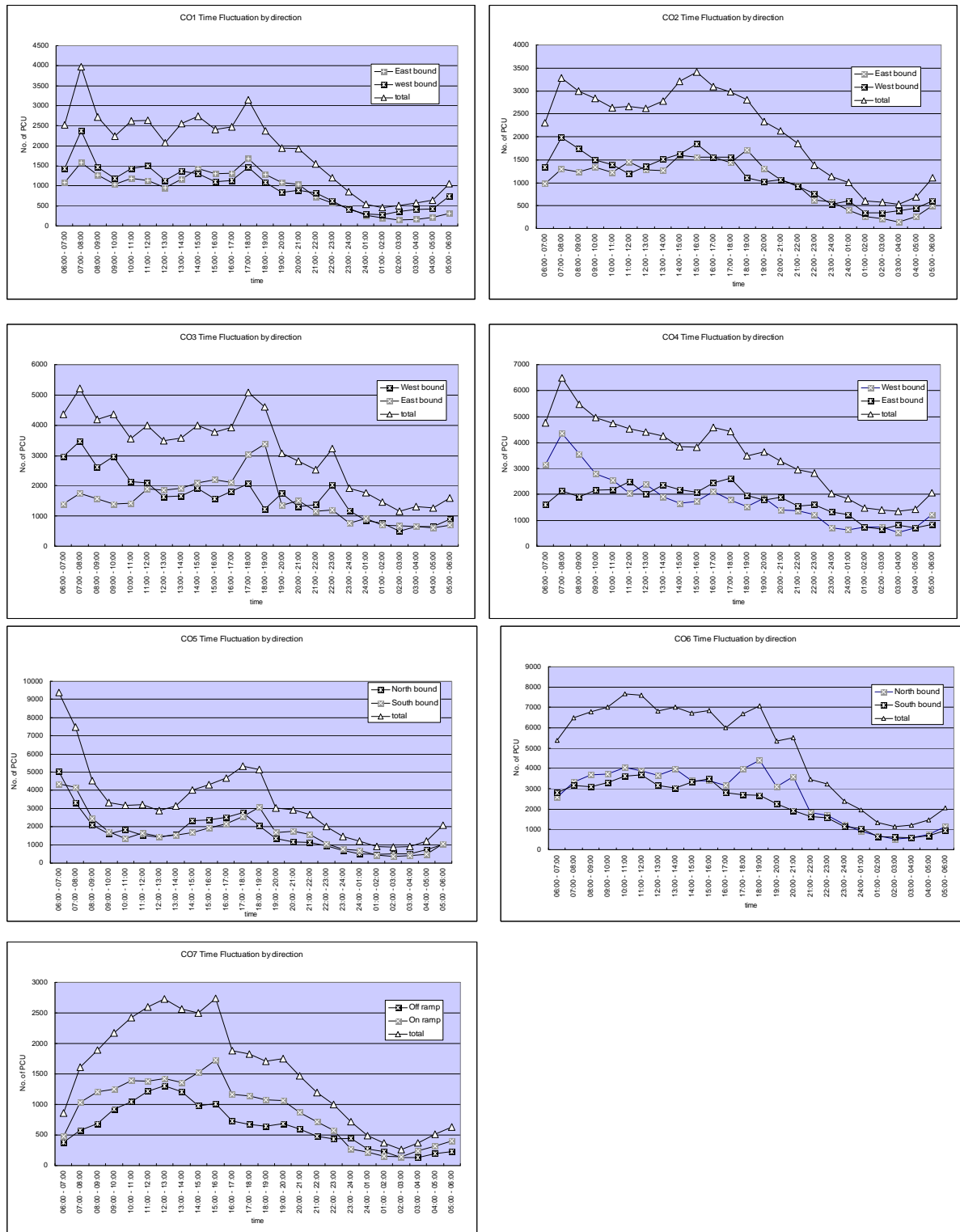


Figure 3.5 Time Fluctuation by Direction

(4) 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 shown in Figure 3.6 and Figure 3.7.

- ✓ Traffic volumes of Jl. Jamper(CO-3), Jl. Cilincing (CO-4) and Jl. Sulawesi(CO-6) section and Tanjung Priok Ramp (CO-7) are increasing, while the traffic volume of Jl. Martadinata (CO-1, CO-2) and Cakung Cilincing (CO-5) 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 decreasing.
 - Stated preference survey result reveals that more than 50% of the toll road users from the western area to Tanjung Priok Port western area select the TgPA 1 Ramp via JIUT route. Therefore comparatively, Jl. Sulawesi has more severe congestion while Jl. Martadinata (CO-1, CO-2) does not have a large traffic volume.
- ✓ The following background is supposed to influence the decrease of traffic flow trend of CO-5.
 - At Cakung Cilincing (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.

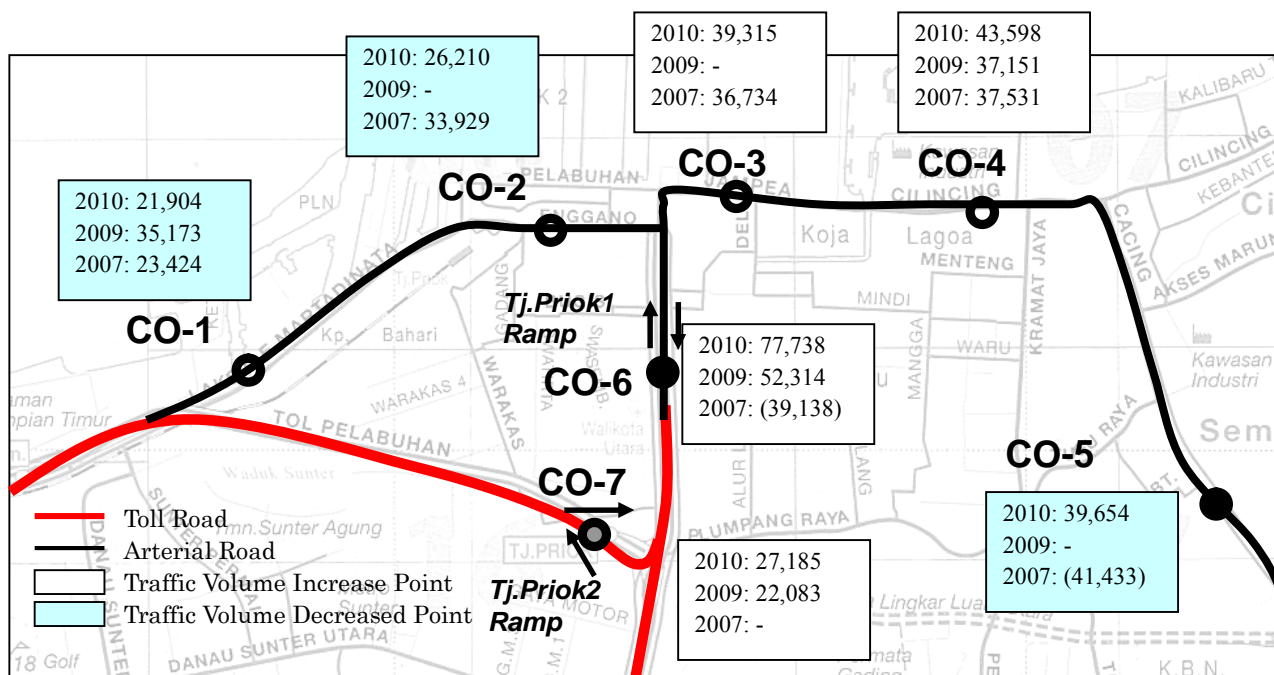


Figure 3.6 Traffic Volume Comparison of 2007, 2009, and 2010 (All w/o motorcycle)

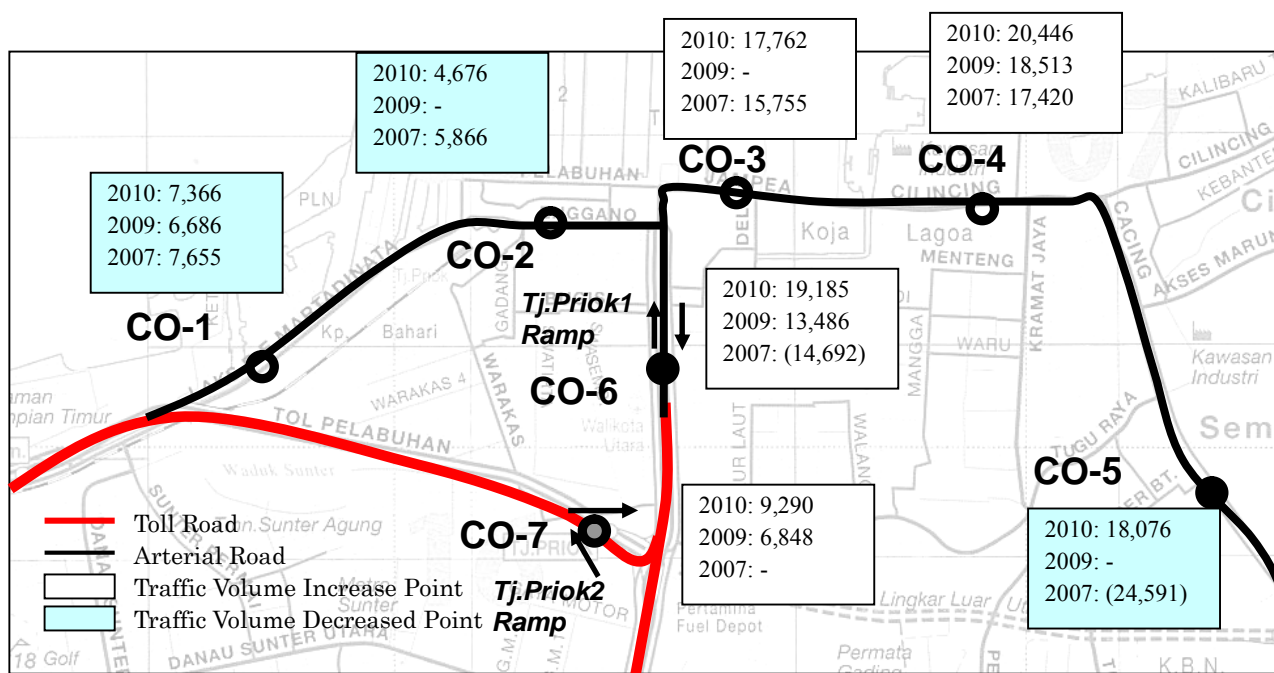


Figure 3.7 Traffic Volume Comparison of 2007, 2009, and 2010 (Freight)

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. This consists of 159 large trucks, 468 medium trucks, and 272 passenger cars.

Table 3.3 List of location place of car user interview

No	Location type	Location place
1	Port Parking	Pelindo POS-III Parking
2	Port Parking	Pelindo POS-9 Parking
3	Port Parking	JICT Parking
4	Port Parking	KOJA Terminal Parking
5	Warehouse 1	Pergudangan Induk Koperasi TNI
6	Gas station 1	SPBU 34-14308
7	Gas station 2	SPBU 34-14105
8	Warehouse 2	PT. Masaji Tatanan Container Depo

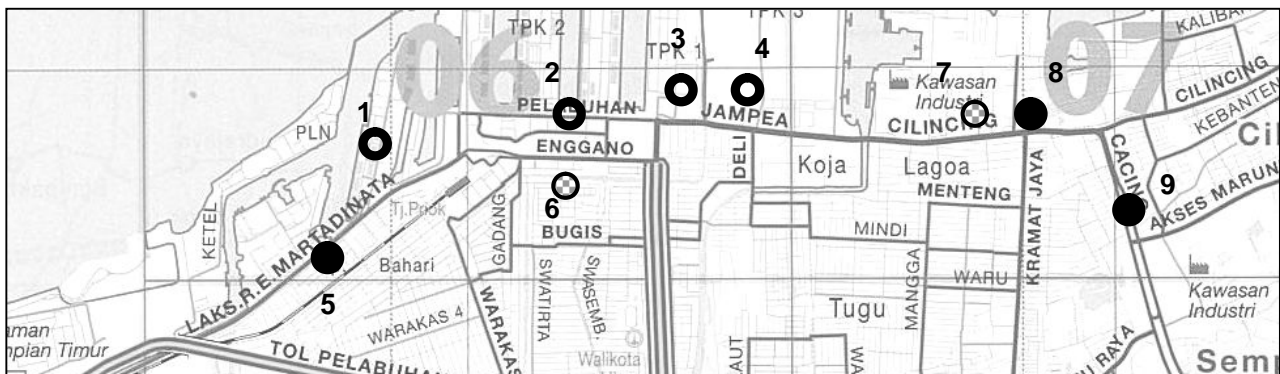


Figure 3.8 Stated Preference Survey Location

(1) Present Toll Road Using Condition

Figure 3.9 shows the present toll road using 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%. One of the reasons is thought the JORR section wholly start operation and it is directly accessible from the southern area via JORR without passing Cawang IC, one of the

most congested areas in the toll road network.

- ✓ 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.

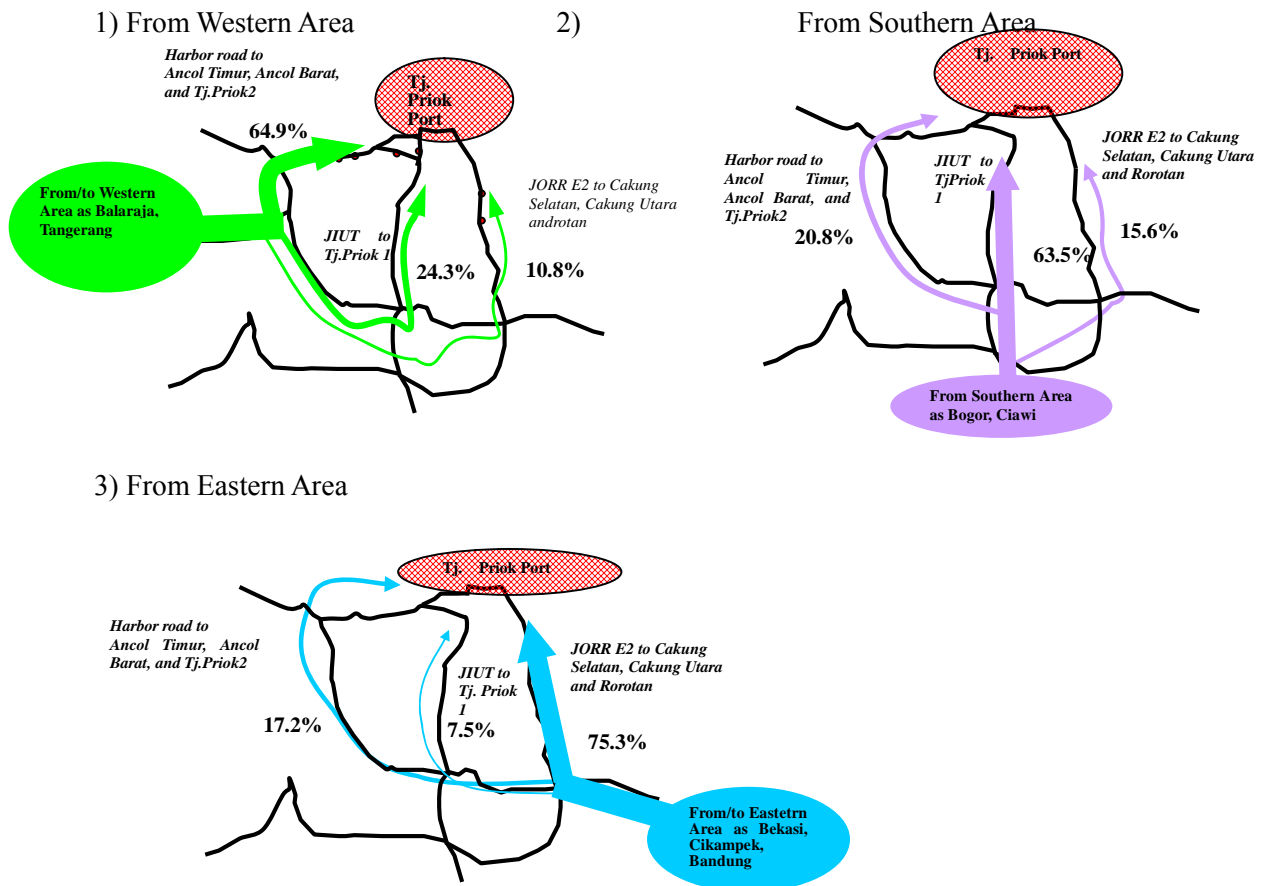


Figure 3.9 Ratio of toll road route to the Tanjung Priok Port and surrounding area

(2) Future Toll Road Usage Preference

1) Trend in the Tj. Priok Traffic

Figure 3.10 shows the future toll road user preference from and to the Tanjung Priok area and vice versa, after the TgPA operation starts.

The main characteristics of the user preference are as follows:

- ✓ From Tangerang, Baralaja (western area): to arrive at the western facility, drivers which are willing to use Kampung Bahari Ramp occupy the largest portion with 48.9% in case 1. In

case 2, drivers using Koja Barat Ramp occupy 45.9%. To arrive at eastern facilities, even in case 1, vehicle users which selected Koja Barat ramp has the largest portion with 47.5% and in case 2, those who select said route share the majority by 64.3%.

- ✓ From Bogor, Ciawi (southern area); to arrive at the western facility, drivers who use Kebon Bawang Ramp via JIUT share the largest portion with 69.8%. In case 2, Kebon Bawang user increased to 82.5%. To arrive at the eastern facilities, the ratio of those who select Kebon Bawang Ramp does not change significantly. On the other hand, vehicle users which select Koja Timur Ramp via the TgPA W section increased.
- ✓ From Bekasi, Bandung (Eastern area); to arrive at the western facilities, 45.8% of the drivers selected Koja Timur Ramp. In case 2, due to increase in user fees, Koja Timur users decreased to 13.5%, and Rorotan user increased to 62.5%. To arrive at the eastern facilities, in case 1 Koja Timur Ramp users have the majority by 50.5% and in case 2, Koja Timur user decreased to 31.4%.

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.

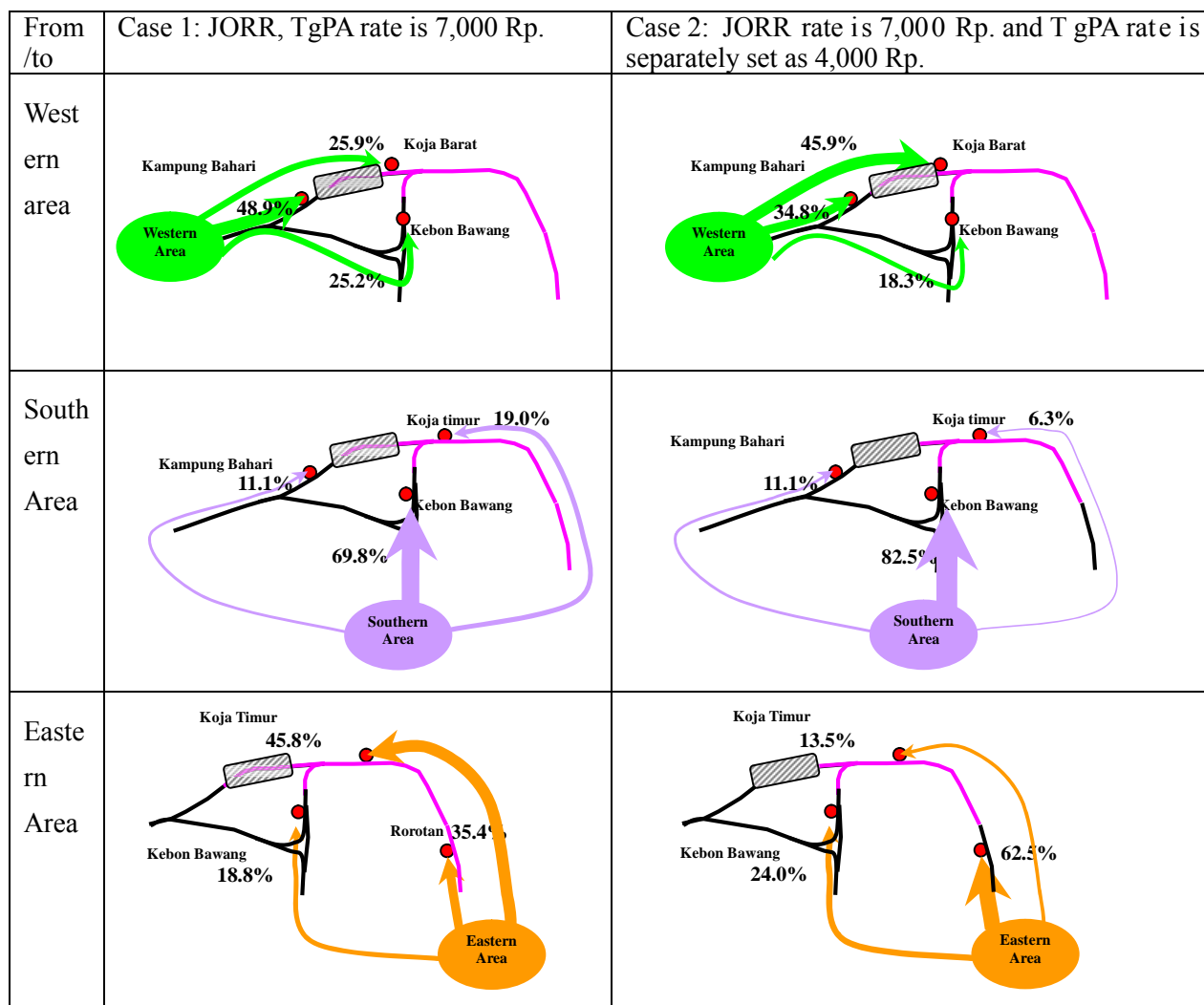


Figure 3.10.1 Future toll road user preference to western facility of Tanjung Priok Port and surrounding facility

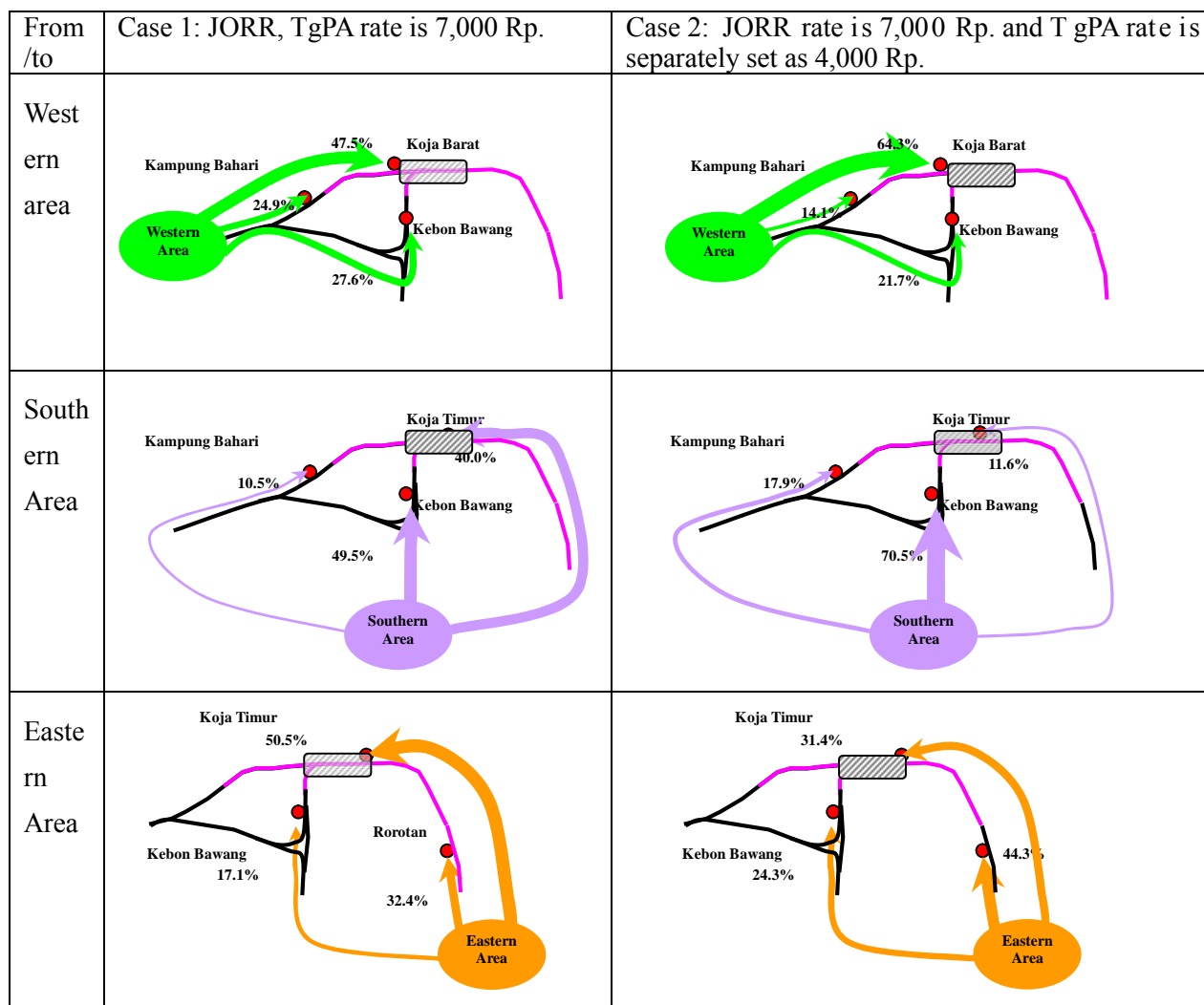


Figure 3.10.2 Future toll road user preference to eastern facility of Tanjung Priok Port and surrounding facility

2) Tendency of 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 3.4 shows the rate of utilization of TgPA and JIUT by case and by vehicle category.

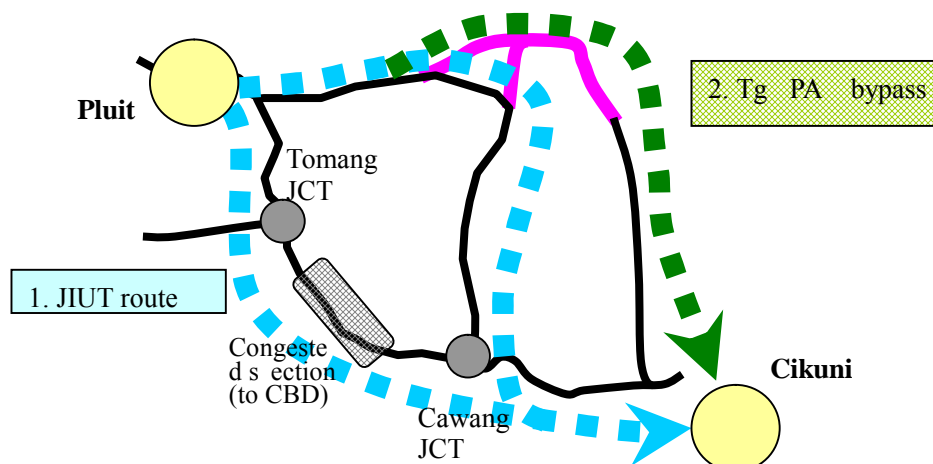


Table 3.4 Utilization rate of TgPA for through traffic in Jakarta Urban Area

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 as shown in Table 3.5 and Figure 3.11, by the morning peak and midday non-peak time, per direction.

A pair of surveyors (a driver and a recorder) took a car to check the following items using a GPS measuring device.

Table 3.5 List of Travel time survey route

Route	Start Point/Finish Point (distance)	Main Route To/from Tanjung Priok Port
1	Cakung city (13km)	Cakung Industrial Area – Jl. Rorotan – Jl. Cakung Cilincing – Jl. Cilincing – Jl. Jampea
2	Cikarang city (43km)	Raya Cibarusah – Cikarang IC- Jakarta Cikampek toll road – Cikunir JCT – JORR – Rorotan toll barrier - Jl. Cakung Cilincing – Jl. Cilincing – Jl. Jampea
3	Citeureup city (43km)	Cibinong IC – Jagorawi toll road – JIUT – Tanjung Priok Toll barrier – Jl. Sulawesi
4	Balaraja city (72km)	Balaraja Barat IC- Jakarta Merak Toll road – Tomang JCT – JIUT – Tanjung Priok 2 Ramp – Laks. Yos. Sudarso – Jl. Sulawesi

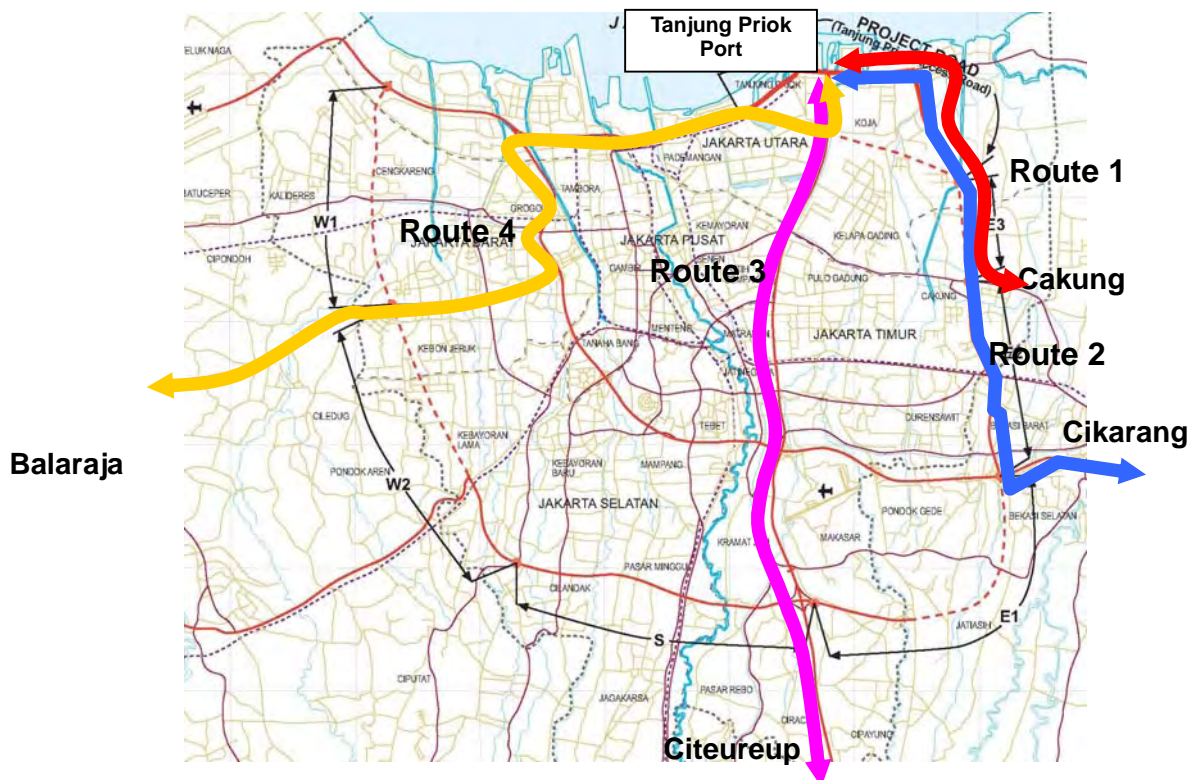


Figure 3.11 Travel time survey route

1) Average travel time by route

Table 3.6 shows the average travel time along four routes. The average travel time of morning peak inbound is the longest among both directions and time modes. In the following section of considering morning inbound direction, travel speed is comparatively slow as shown in Figure 3.12:

- ✓ The sections between JORR to JIUT (route 3, 4)
- ✓ 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. In route 1, from Jl. Cacing to Jl. Cilincing, travel speed is lower than 20 km/hr.

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. The characteristics noticed in Figure 3.12 and 3.14 are:

- ✓ The travel speed of arterial road near Tanjung Priok Port is almost less than 20 km/hr on morning peak and non-peak hours.
- ✓ Travel speed of a section of Tanjung Priok Port leading to its ramp (route 4, outbound) is very slow with less than 20 km/hr.

Table 3.6 Average Travel Time of Surveyed Route

Route	Inbound				Outbound			
	Morning Peak		Midday Non peak		Morning Peak		Midday Non peak	
T	ime(min)	Speed (km/h)	Time(min)	Speed (km/h)	Time(min)	Speed (km/h)	Time(min)	Speed (km/h)
1 62		13.7	36	23.6	33	23.6	36	23.7
2 92		28.1	72	36.1	76	34.1	80	32.3
3 90		29.1	74	35.4	53	51.9	55	49.4
4 127		27.1	107	32.1	106	33.7	111	31.9

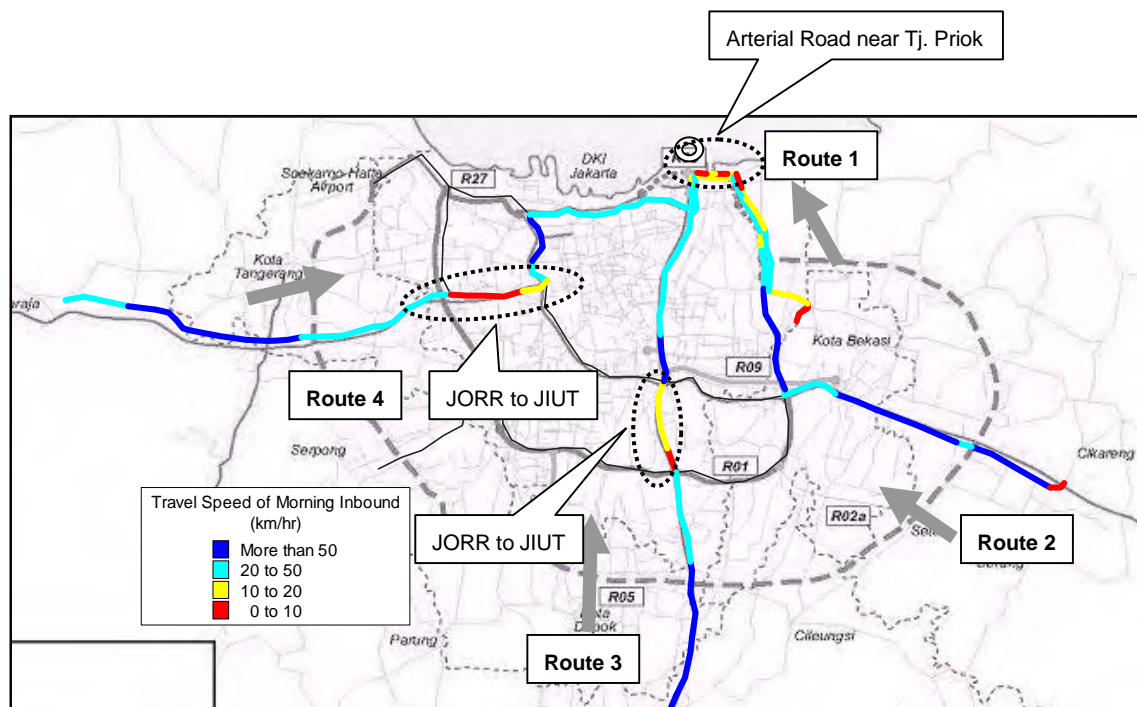


Figure 3.12 Travel speed of Morning Peak (Inbound)

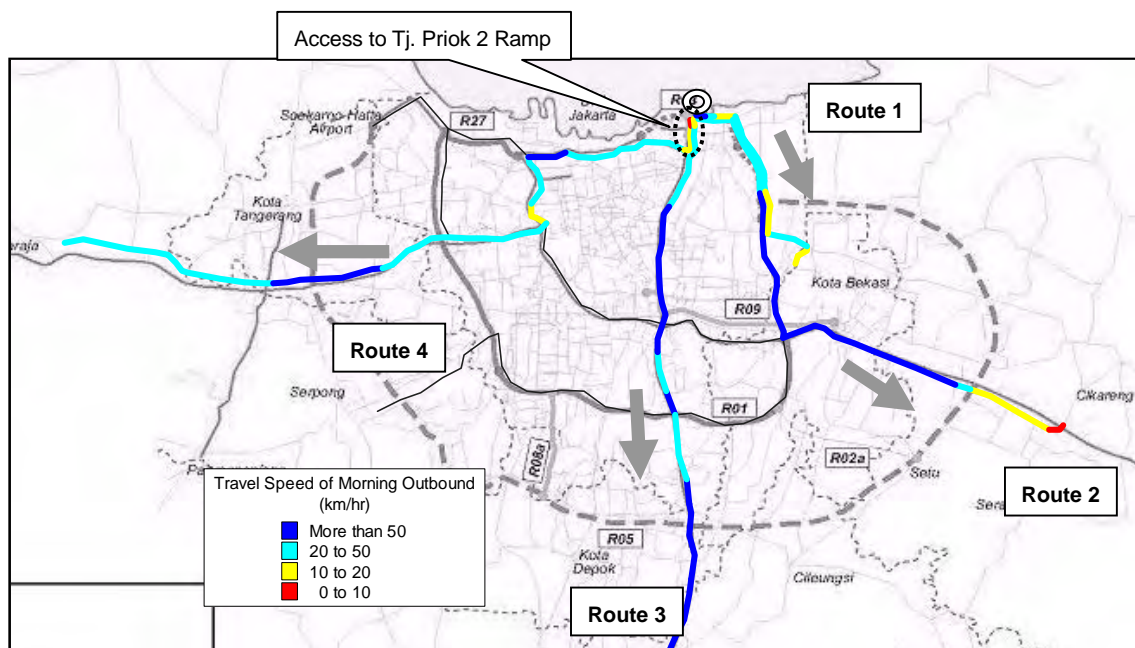


Figure 3.13 Travel speed of Morning Peak (Outbound)

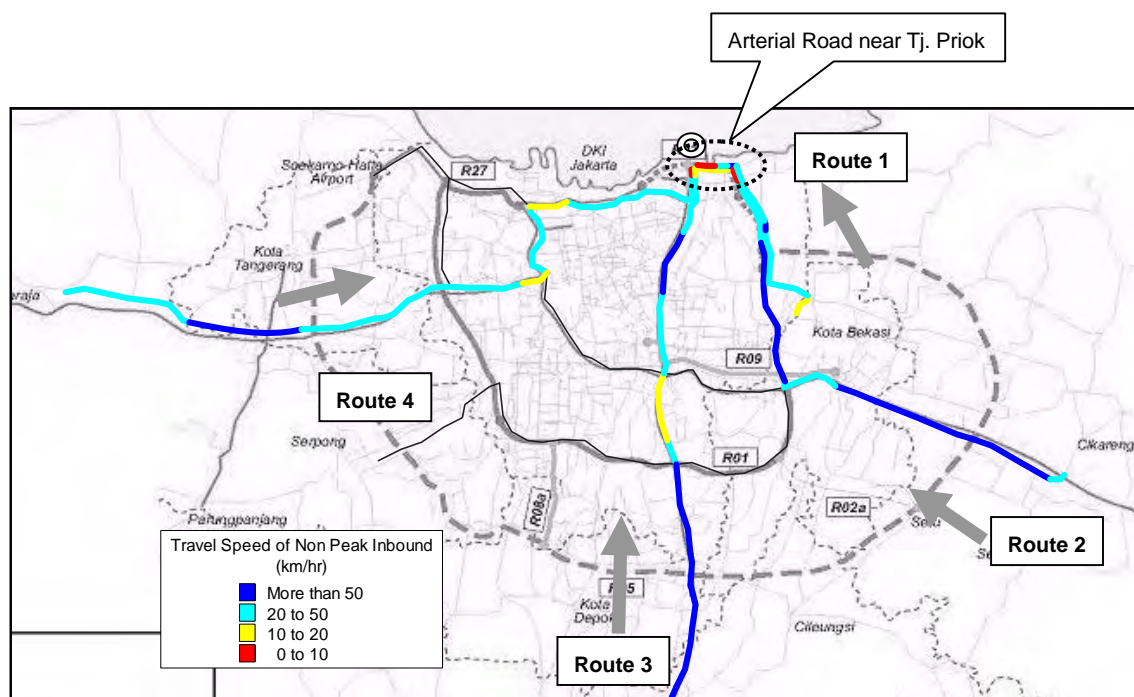


Figure 3.14 Travel speed of Midday non Peak (inbound)

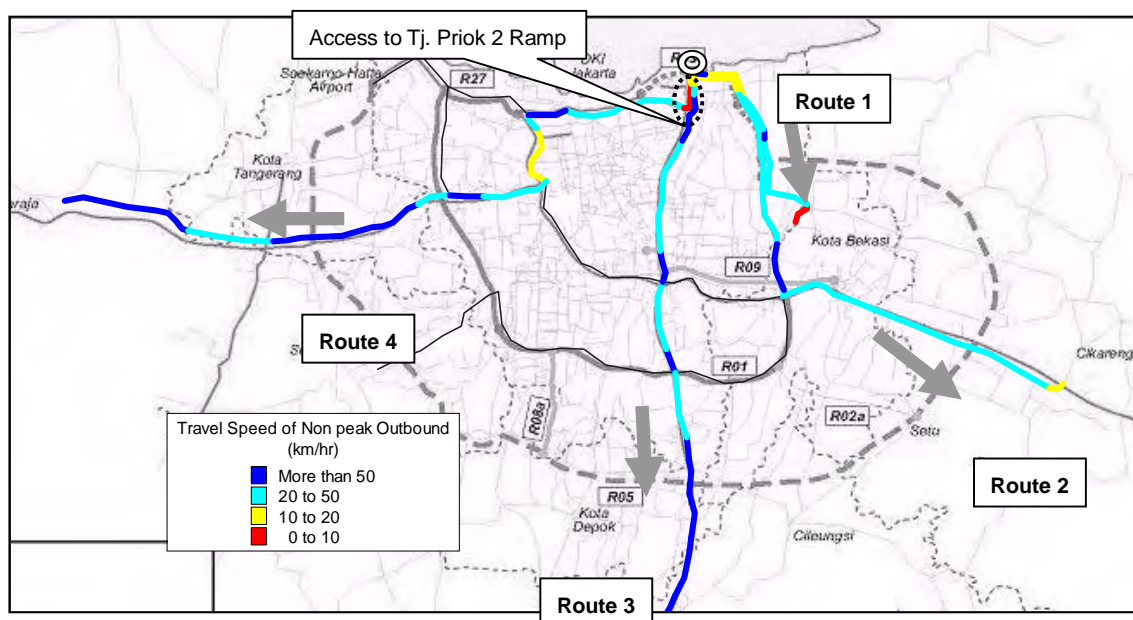


Figure 3.15 Travel speed of Midday non Peak (Outbound)

3.3 Examination of Newly Emerged Development Plans Affecting Traffic Demand

3.3.1 Developing the Future's Vehicle OD (Origin-Destination) Table

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

Since vehicle traffic tends to reflect a phenomenon of local economic activities, its traffic generation depends on local GRDP, number of registered vehicles, and so on.

- The recent GRDP of Jakarta City steadily increases with an annual rate of around 6%. Moreover, the growth rate in the same period of per capita GRDP is around 5%.

Table 3.7 GRDP and Per Capita GRDP on DKI Jakarta at 2000 Constant Market Prices

		2004	2005	2006	2007	2008
GRDP	(Billion Rupiahs)	278,525	295,271	312,827	332,971	353,539
	Growth Rate of GRDP(%)	5.65	6.01	5.95	6.44	6.18
Per Capita GRDP	(Thousand Rupiahs)	31,832	33,205	34,837	36,733	38,654
	Growth Rate of GRDP(%)	4.33	4.31	4.92	5.44	5.23

Source: Gross Regional Domestic Product of Provinces in Indonesia by Industrial Origin 2004–2008

- The total number of vehicles registered in Jakarta City has been increasing dramatically for the recent 8 years. In the figure below, the annual growth rate is 15.4% of all the vehicle types. It also shows four-wheel vehicles increase at an annual rate of 7.5%, while the motorcycle's annual rate is 20.7%.

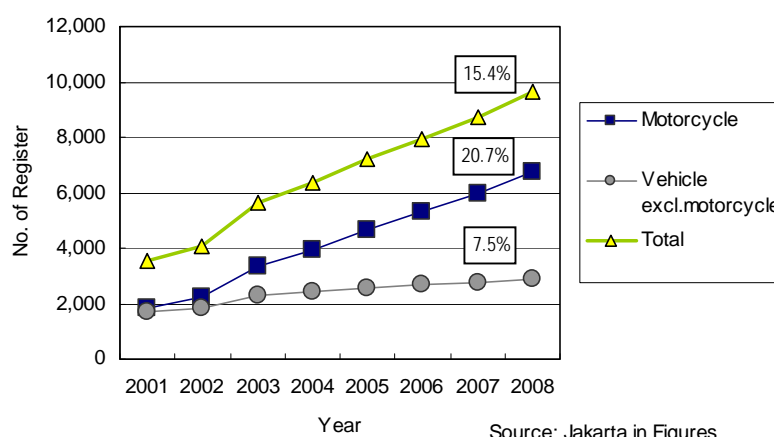


Figure 3.16 Transition of No. of Registered Vehicles

Figure 3.17 shows the change in traffic volume of toll roads, which Jasa Marga manages, and the revenue from the fare. Although the revenue increases due to periodic fare hikes, traffic

volume along toll roads continues to slightly increase (annual rate of 2.6%) after 2005.

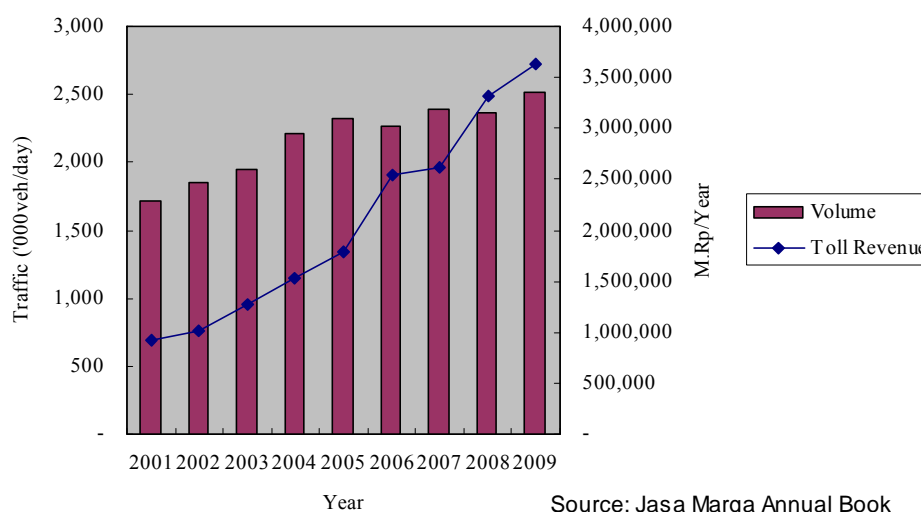


Figure 3.17 Daily Traffic Volume of Toll Road

- This means that, although 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 3.18). 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. Said estimate is also employed as a growth rate in this examination (See Table 3.8). In addition, the following growth rate after 2025 is

Increase ratio per annum after the year 2020

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 (See Figure 3.19).



Table 3.8 Forecast of Port Related Traffic by Vehicle Type

Vehicle Type	Daily Traffic Volume (veh/day)			Increase Ratio	
	2002	2012	2025	2012/2002	2025/2012
Passenger Car	17,854	29,780	40,456	1.67	1.36
Sedan	13,715	22,538	30,665	1.64	1.36
Van	4,139	7,242	9,791	1.75	1.35
Small Bus	78	148	198	1.90	1.34
Medium/Large Bus	194	469	615	2.42	1.31
Trucks for Cargo	22,689	32,379	41,829	1.43	1.29
Pick up	2,363	2,490	3,634	1.05	1.46
Truck 2 Axles (Medium Truck)	3,040	3,374	4,615	1.11	1.37
Large Truck	17,286	26,515	33,580	1.53	1.27
Truck 3 Axles	3,036	3,055	4,216	1.01	1.38
Truck with Trailer	111	1,115	2,006	10.05	1.80
Trailer Truck	14,139	22,345	27,358	1.58	1.22
Total	40,815	62,776	83,098	1.54	1.32

Source: The Study for Development of Greater Jakarta Metropolitan Ports(Summary Report), pp88

2) Ancol Area Development Plan

A seaboard in the northern part of Jakarta City is reclaimed, and planned to be converted to residential houses, office buildings, hotels, commercial entertainment facilities, public facilities, and parks (See Figure 3.19). In the plan, Stage I will be completed by 2015, and Stage II by 2025. By the estimates, Stage I is expected to generate and attract 22,378 cars at peak hour, while Stage II will also bring 27,513 cars at peak hour (See Figure 3.20 and Table 3.9.).



Figure 3.19 Location of Ancol Development

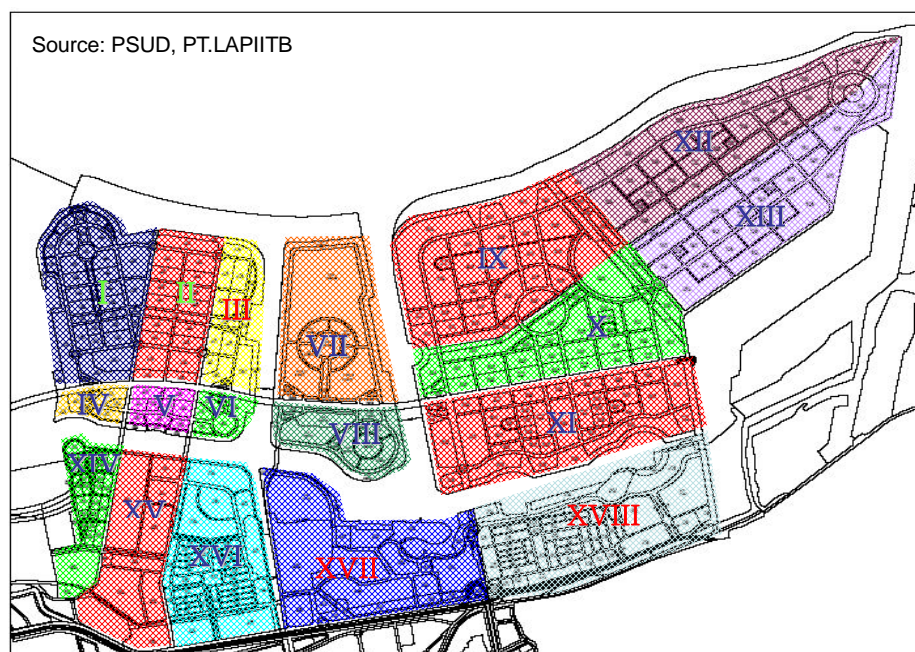


Figure 3.20 Zoning of East Pantura Reclamation Area

Table 3.9 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 the central government and DKI 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 3.21 KBN Marunda SEZ Development Plan

3.3.2 Creating a Future Road Network

The future road network in the year 2020 was created during the detailed design phase. The Ancol development-related roads were considered as part of the network, which should be added to the future's 2020 road network (See Figure 3.22).

Especially, the interchange plan which aims to connect a toll road directly from the Ancol development area, is planned around the junction of Harbor Road and Tanjung Priok Access Road. Therefore, this Interchange plan is considered as one of the project cases in this study.

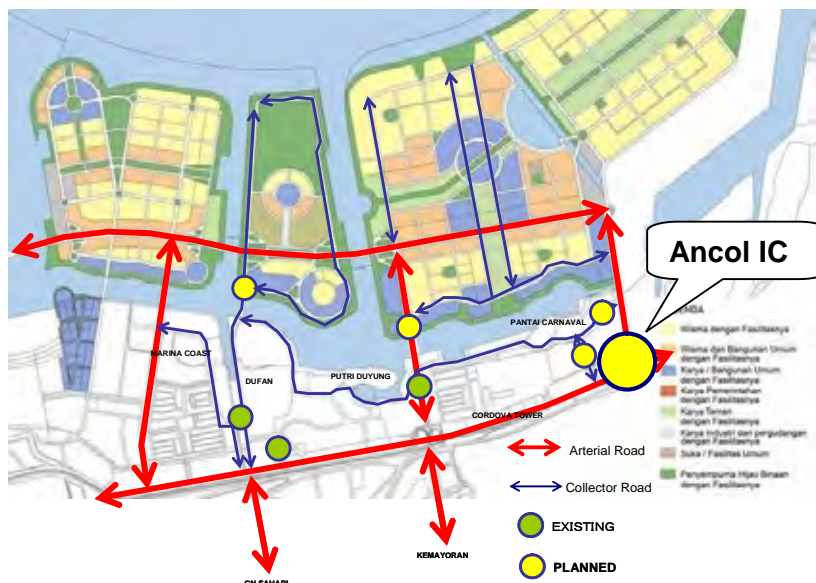


Figure 3.22 Road Network around Ancol Development Area

3.4 Development of Alternative Traffic Demand Forecast Cases

Table 3.10 shows the cases of the demand forecast carried out in this study.

Table 3.10 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.

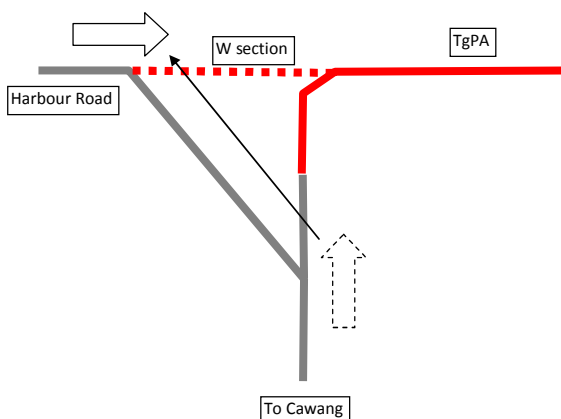
Independent case means 4,000 Rupiahs is applied to TgPA independently apart from JORR.

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 3.23. Meanwhile, the result of the case where the W Section is constructed as well is shown in Figure 3.24.

When the W-1 and W-2 sections are constructed, the traffic of NS Link is smaller compared with the Base Case, but on the contrary, the traffic in the 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 Harbour Road to the W section of TgPA (See adjacent Figure).



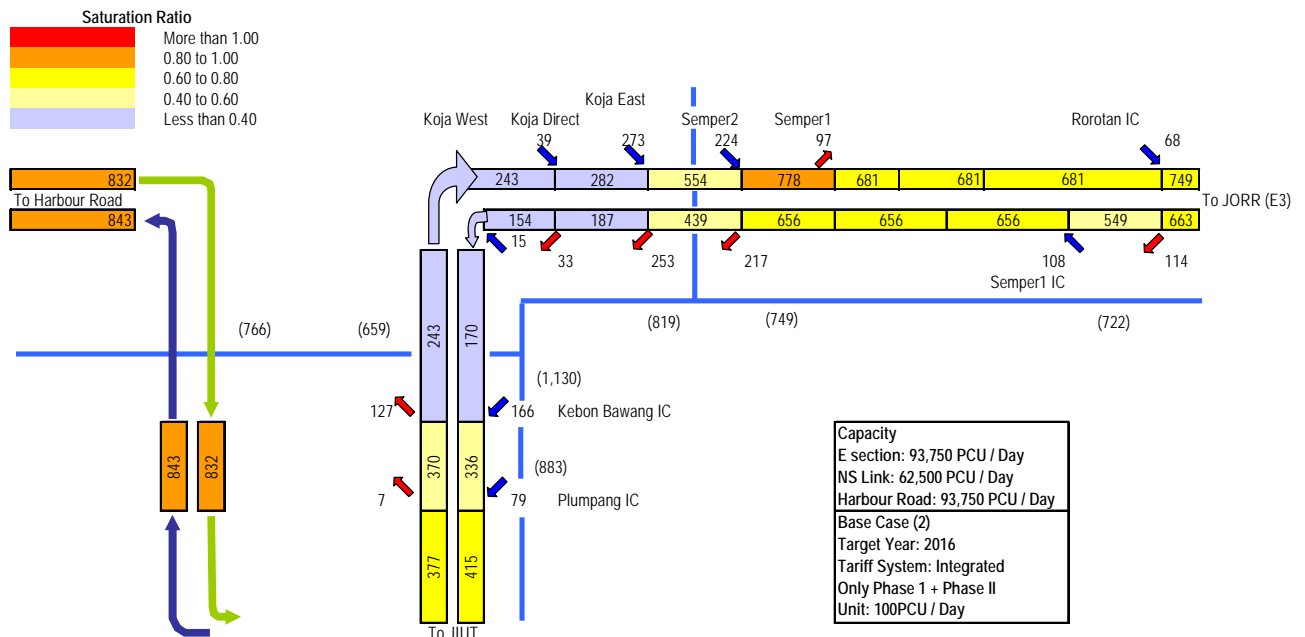


Figure 3.23 Assignment Traffic Volume (Base Case – Year 2016)

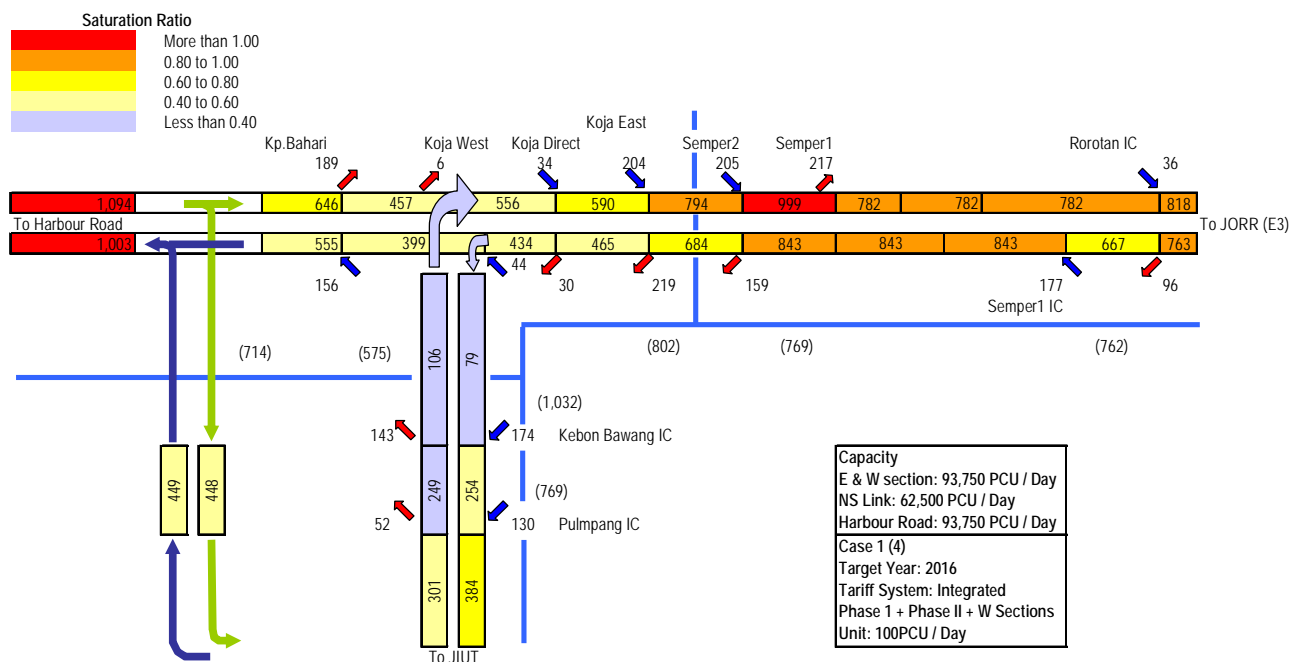


Figure 3.24 Assignment Traffic Volume (Case 1 – Year 2016)

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 3.25.

It is found that the traffic of the TgPA increases even if only the 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).

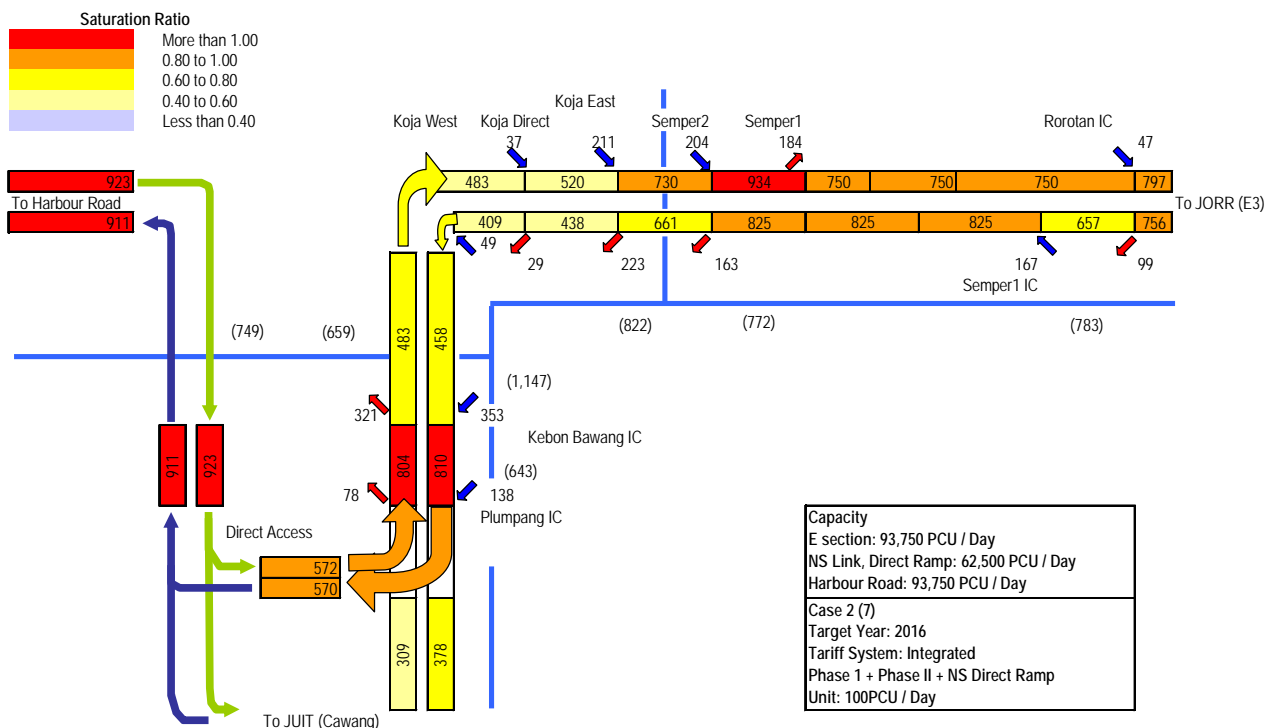
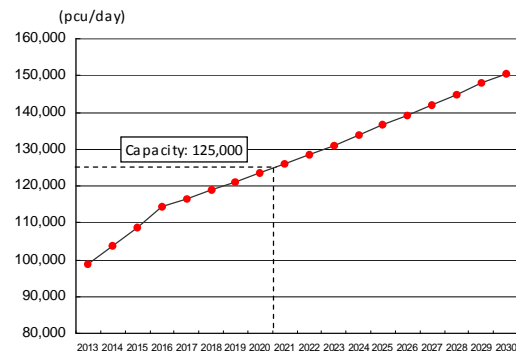
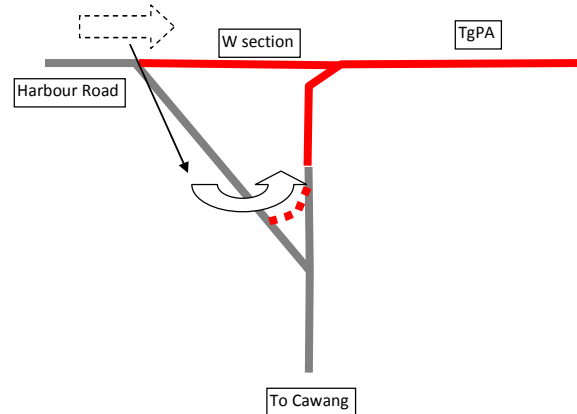


Figure 3.25 Assignment Traffic Volume (Case 2 – Year 2016)

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 Phase 1 and Phase 2 is shown in Figure 3.26.

When the Direct Ramp is constructed as well as the W Section, the traffic in the eastern sections, from Semper t o 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.

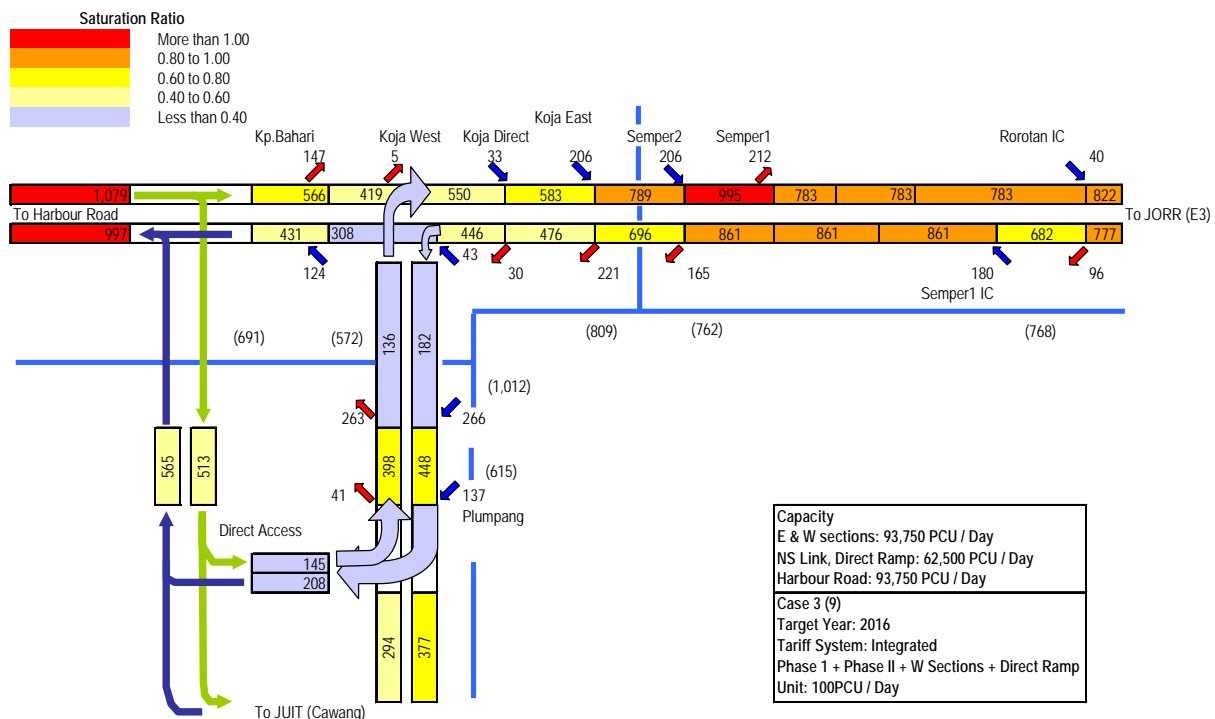


Figure 3.26 Assignment Traffic Volume (Case 3 – Year 2016)

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 3.27 shows the assignment volume result of the case when TgPA fare is Rp. 4,000, independent from JORR.

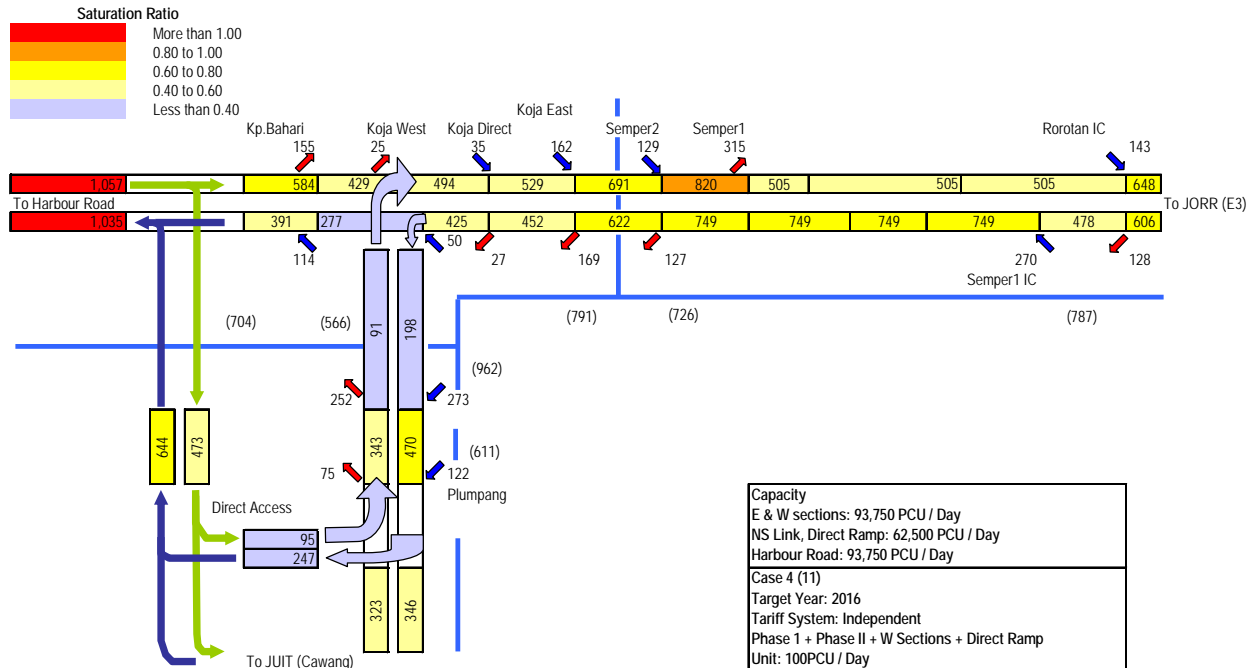


Figure 3.27 Assignment Traffic Volume (Case 4 – Year 2016)

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 3.11 indicates the comparison of the total fare income between an option 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 to 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 3.11 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 Ancol Interchange Construction (Case 5 of Demand Forecast)

Assignment traffic volume is shown in Figure 3.28 in case the Ancol Interchange (Ancol IC) development is implemented in addition to TgPA development. The TgPA main line traffic volume is almost unchanged in spite of the interchange construction (comparing Figure 3.25).

Inflow and outflow traffic of TgPA and the Harbor Road to Ancol will be larger. Therefore, when the Ancol IC is projected, construction of ramps from these areas should be considered.

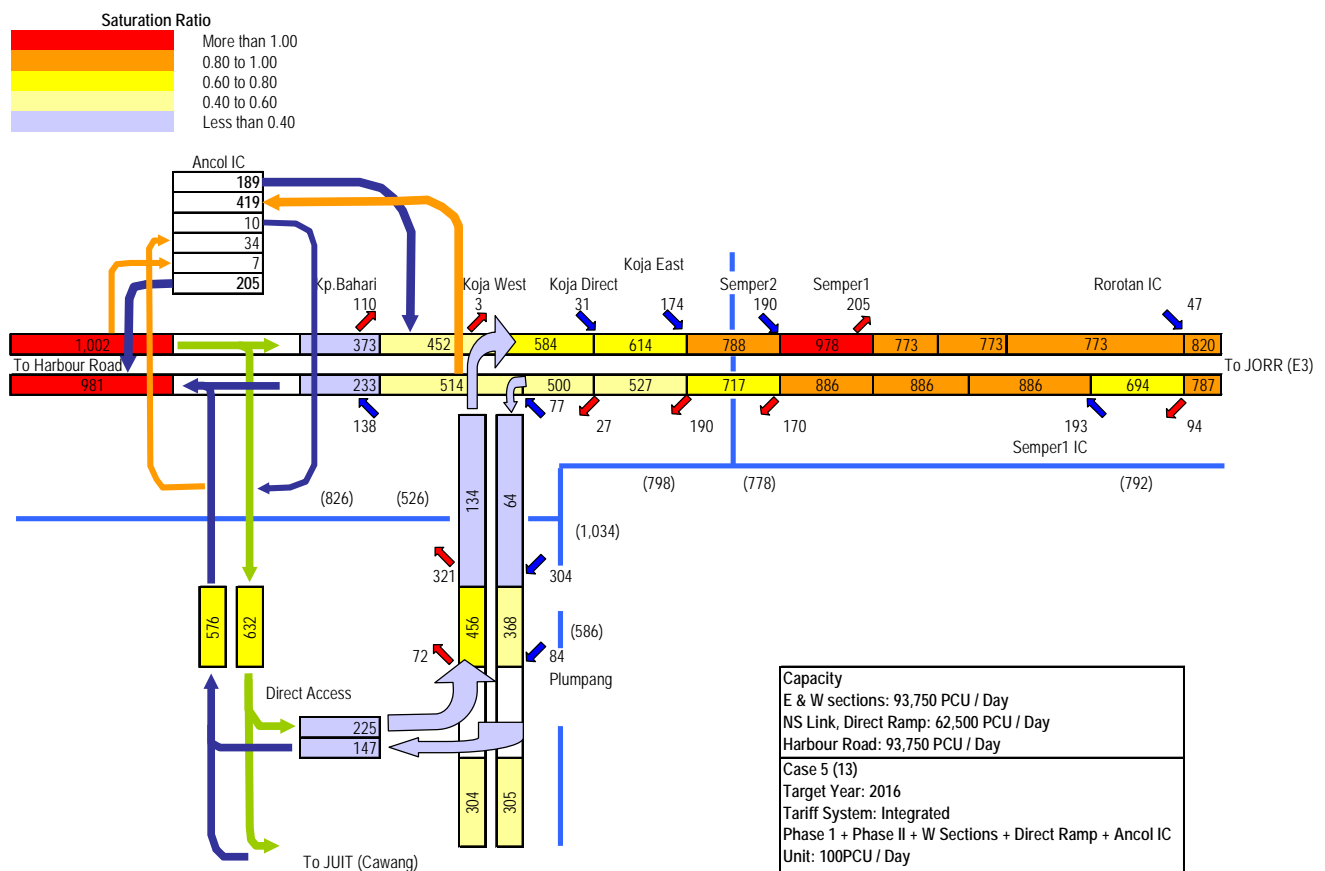


Figure 3.28 Assignment Volume Result (Case 5 – Year 2016)

3.5.6 Analysis of Impact to the Road Network

Table 3.12 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 Direct Ramp are constructed, traffic volume of JIUT (Cawang-Tj. Priok, JI-5) is expected to decrease 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

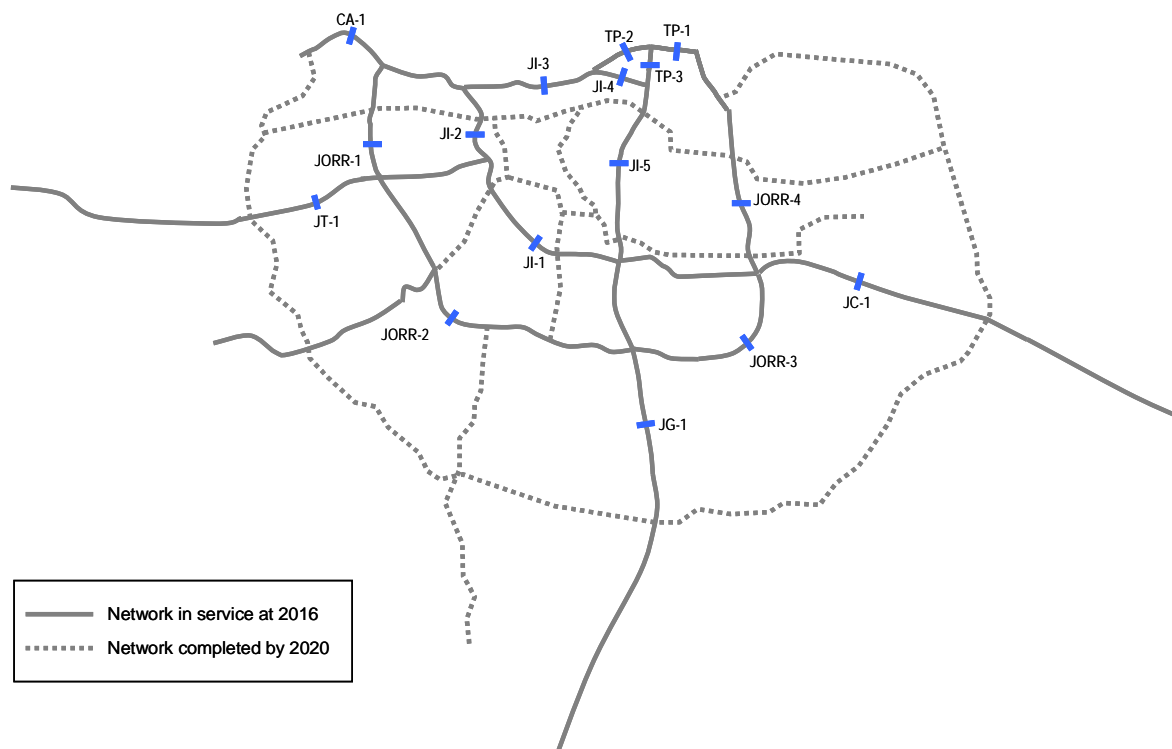
volume of a Harbor Road section (JI-4) is evidently decreased. This indicates that the traffic flow from Harbor Road to Tanjung Priok diverts to the TgPA W section.

Table 3.12 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 m	Width m	Area m ²
		from	to	Superstructure	Substructure			
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(continuous)	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. 20	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. 15	0+653.00	0+795.00	Steel Box Girder	T-pier	142	11	1,598
	Ramp - B, from PB. 15 to PB. 22	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. However, an alternative to the cable-stayed bridge of W-2 section is not studied in order to maintain the original plan. The details of cable stayed bridge are described in Section 4.1.3.

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

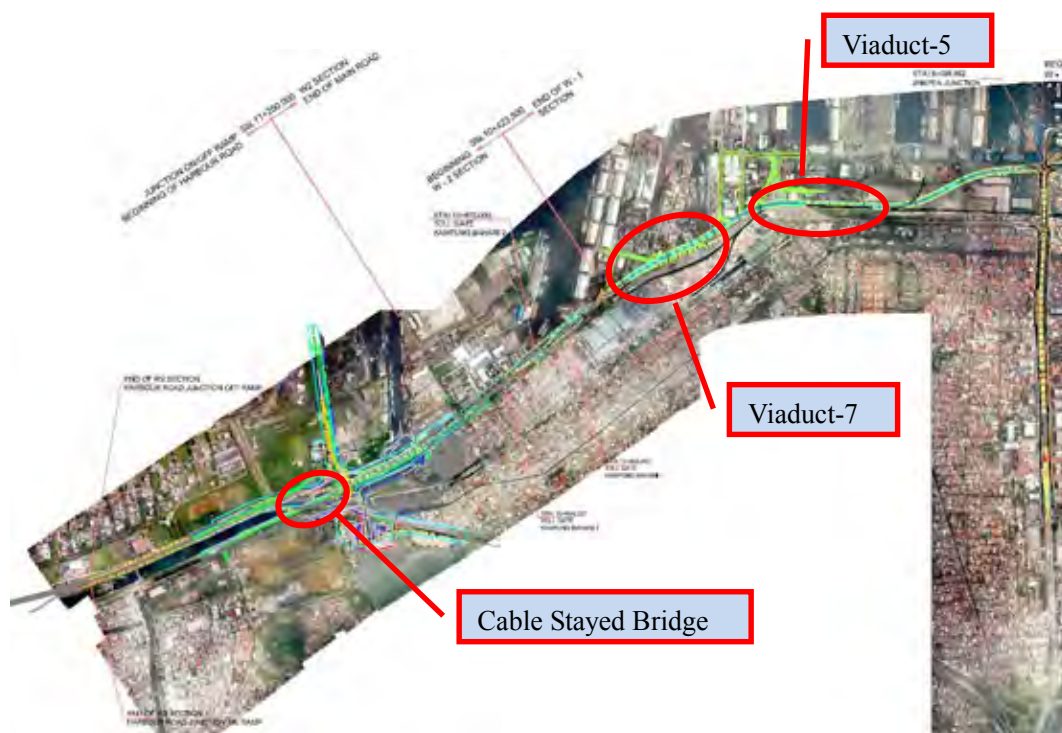


Figure 4.1 Location of Viaduct-5,7 and Cable Stayed Bridge

Except for structures which stipulated above Table 4.2, the JICA Survey Team recommends the modification of the structure type of Viaduct-4 on W-1 from steel girder to PC girder. However, their pier locations of Viaduct-4 have been agreed between Bina Marga and PT.Pelindo II. Thus, it is difficult to change the pier locations without revision of the agreement between Bina Marga

and PT.Pelindo II. Hence, JICA Survey Team recommends that the structure type of Viaduct-4 will be examined in the Phase 4 considering Bina Marga's and PT.Pelindo II's opinions.

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.

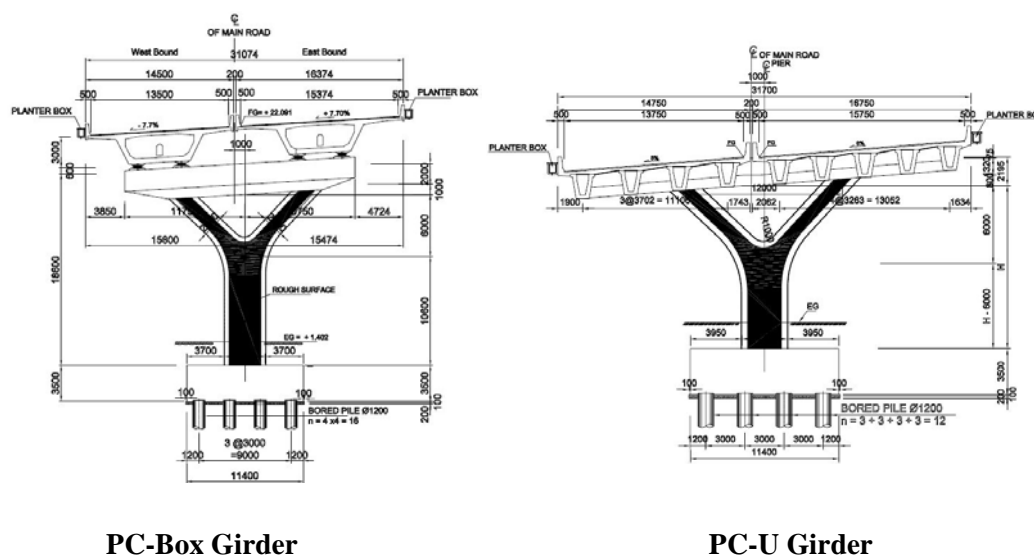


Figure 4.2 Cross Section of PC-box and PC-U

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 the 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 Modification of Cable-Stayed Bridge (W-2) and Ancol IC.

A cable stayed bridge is planned on the W-2 section at the overhead crossing of the Harbor Toll Road. Moreover, the Ancol IC is planned by DKI to connect the W-2 section of TgPA and Harbor Toll Road around this cable-stayed bridge. However, the alignment of the Ancol IC was not designed economically, because the alignment of Ancol IC should avoid connecting to the pylon and stayed cables of the Bridge. Thus, design of this alignment appears to be complex. (Figure 4.3)

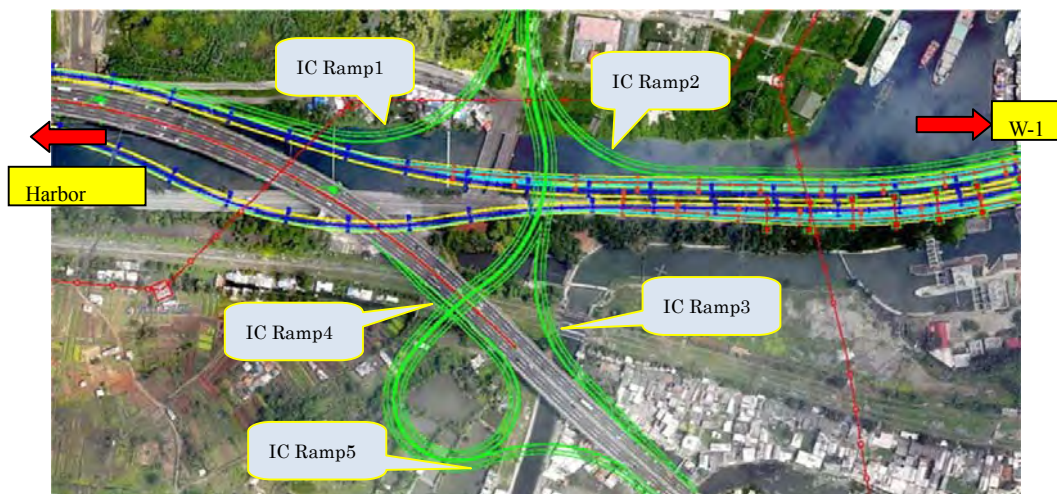


Figure 4.3 Original Ancol IC Alignment

At the beginning of this survey, the study for an alternative to the cable-stayed bridge was planned in order to simplify the Ancol IC alignment. However, as stipulated in Section 3.5.5 concerning its traffic volume, only three ramps are required as follows;

- IC Ramp 2 and 4 in Figure 4.3
- The ramp connecting Ancol to the W-1 section.

Hence, the alignment of Ancol IC can be simplified without changing the cable-stayed bridge since the number of ramps can be reduced from five to three. Therefore, an alternative to the cable stayed bridge is not considered in this survey.

However, this cable-stayed bridge seems to be selected as part of the D/D stage for reasons of aesthetics and landmark establishment. Thus, considering the limited national finance of Indonesia, the Survey Team suggests that the structure type of cable stayed bridge is examined in the Phase 3 in consideration of construction cost including approach bridges and safety

during construction.

For reference, the alignment of Ancol IC is shown in Figure 4.4, considering that cable-stayed bridge is changed to another bridge type.

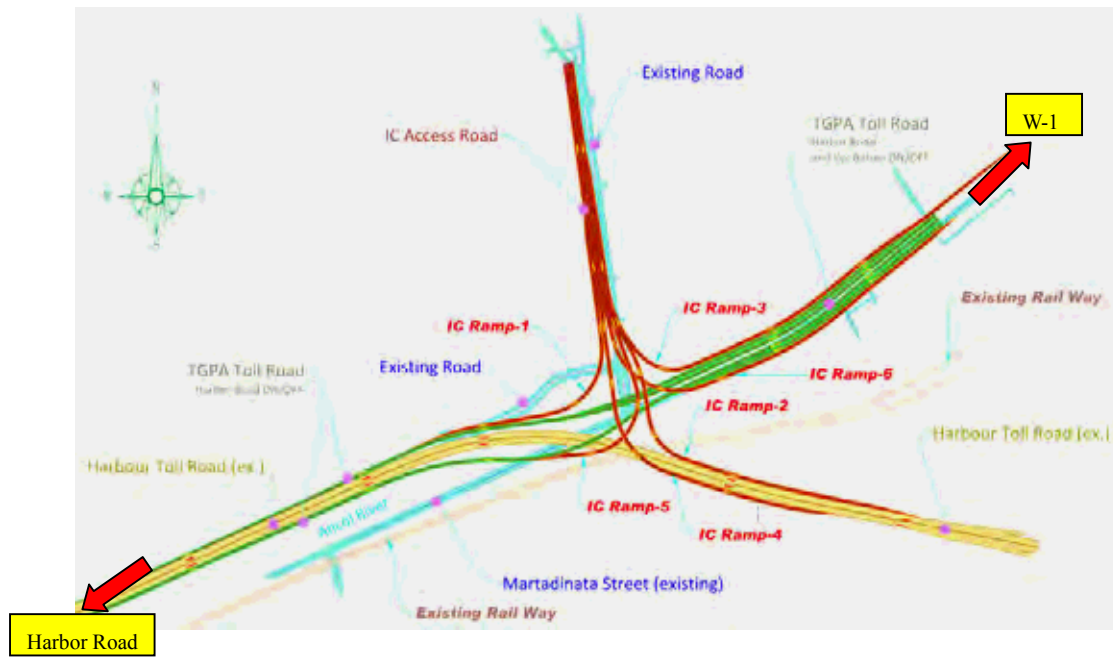


Figure 4.4 Recommended Ancol IC Alignment

4.1.4 Adjustment with Jl.Martadinata

The Jl.Martadinata, Pasoso Flyover and TgPA W-1 sections overlap as three levels at Sta.9+761 as shown in Figure 4.5.

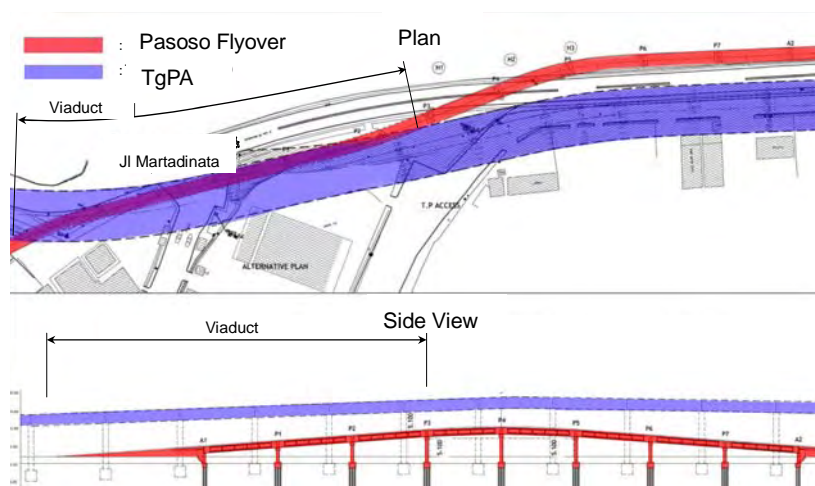


Figure 4.5 Plan of Pasoso Flyover and TgPA

Moreover, the vertical clearance between Jl.Martadinata and Pasoso Flyover was planned to be 5.4 m (requirement is 5.1 m), while the vertical clearance between Pasoso Flyover and TgPA was planned to be 11.7 m. However, the elevation of Jl.Martadinata was raised after the D/D of the TgPA and Pasoso Flyover was completed. Therefore, a topographic survey for Jl.Martadinata was carried out to confirm the road elevation. The survey results are shown in Table 4.4.

Table 4.4 Topographic Survey Results of Jl.Martadinata

Station No.	Original Elevation (m) (m)	Survey Result (m)	Raising (m)
9+600 0.991		2.017	+1.026
9+625	1.252 2.042		+0.790
9+650	1.308 2.069		+0.761
9+675	1.339 2.036		+0.697
9+700	1.373 1.997		+0.624
9+725	1.385 2.002		+0.617
9+750	1.385 2.013		+0.628
9+775	1.372 1.880		+0.508
9+800	1.470 1.725		+0.255

Survey results reveal that the maximum rise is 1.026 m. Therefore, the Pasoso Flyover is accordingly required to be raised by around 1 m to maintain the required vertical clearance (5.1m).

Nevertheless, since the vertical clearance between TgPA and Pasoso Flyover is planned to be approximately 11.7 m, the TgPA alignment does not need to be modified as the vertical clearance is sufficient.

4.1.5 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 4.6. This modification only involves installation of additional one column and foundation. According to rough estimation, increased cost is Rp 2,500 million only.

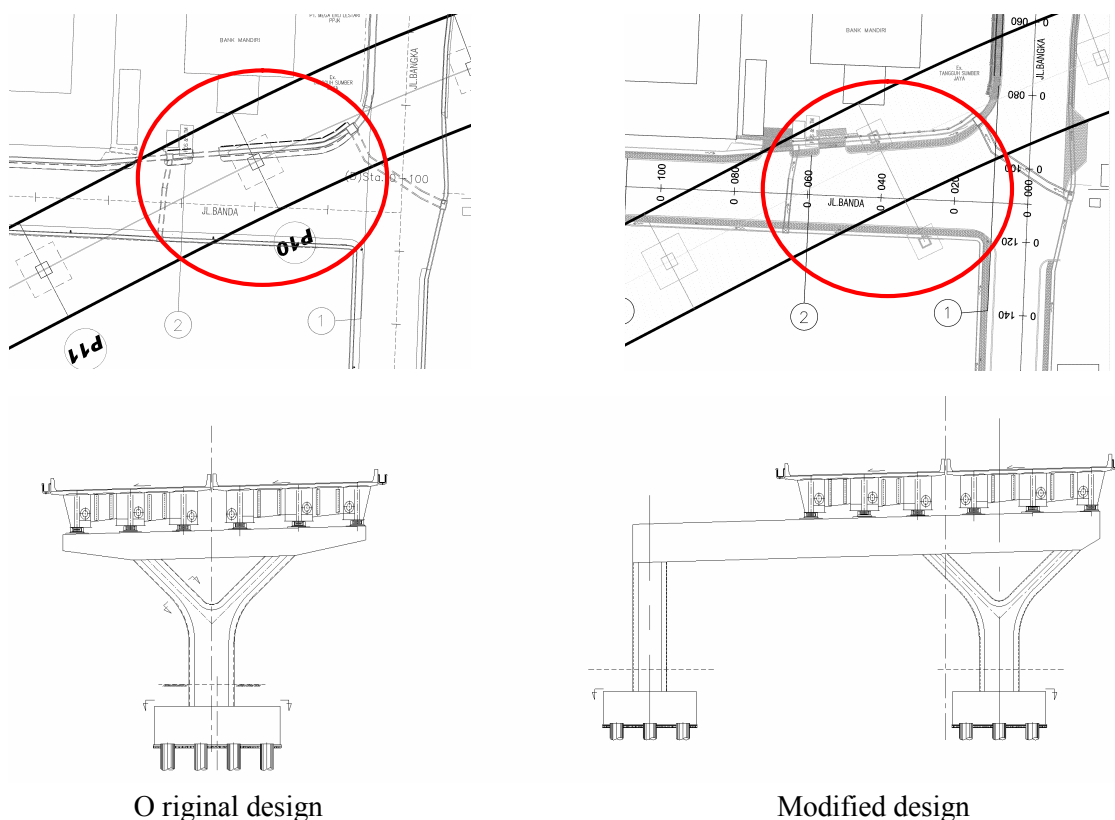


Figure 4.6 Modification of Pier-10 of W-1 Section.

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 4.5.

Table 4.5 Summary of Cost Reduction

Section	Viaduct	Station		Length m	Width m	Original Structure		Alternative Structure		Cost Reduction (Mill. Rp.)
		from	to			Type	Cost (Mill. Rp.)	Type	Cost (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 Procedure of Cost Estimate

The construction cost is updated based on the procedures shown in Figure 4.7.

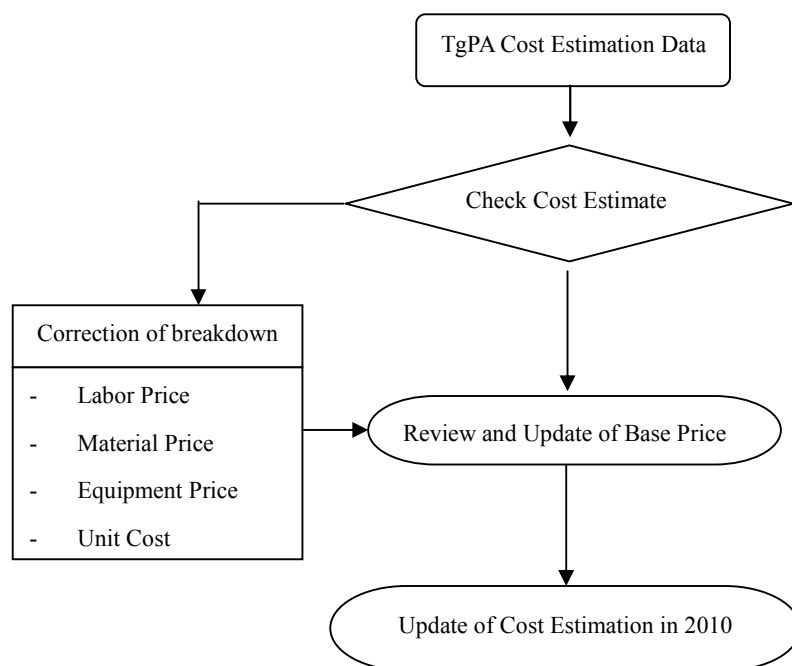
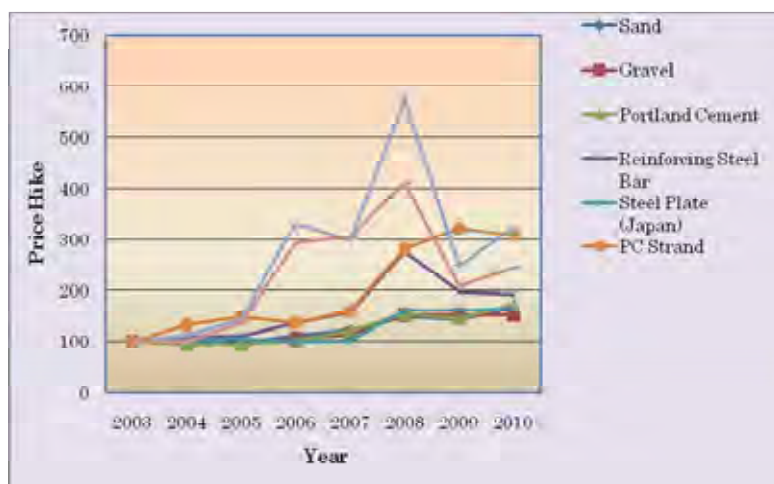


Figure 4.7 Cost Estimate Review Procedure

4.3.2 Update of Unit Price

Significant increase in unit prices of labor and materials has been noted in comparing the prices in the F/S (2003 prices) and 2010 estimates. Figure 4.8 and Table 4.6 show the price hike of major construction materials and labor, respectively, as of 2010.



Source:

1. Patokan Harga Satuan Bahan Dan Upah Pekerjaan Bidang Pemborongan Propinsi DKI Jakarta
2. Pertamina Fuel Price
3. Japan's Official Material Price (Kensetsu Bukka)
4. Quotation of Material Supplier

Figure 4.8 Price Hike of Construction Materials

Table 4.6 Unit Prices of Labor

Items	Unit	Year	
		2003 (F/S)	2010 (SAPI)
Labor	Rp./Day	24760 (100%)	70,587 (285%)
Skilled Labor	Rp./Day	30950 (100%)	83,145 (269%)
Foreman	Rp./Day	43330 (100%)	108,296 (250%)
Operator	Rp./Day	43330 (100%)	108,296 (250%)

Source: Patokan Harga Satuan Bahan Dan Upah Pekerjaan Bidang Pemborongan
 Propinsi DKI Jakarta

As shown in figure and table above, most construction materials and labor prices have been hiked especially from 2006 to present.

Under such situation, the construction cost of TgPA has increased drastically.

4.3.3 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 as stipulated in the above tables.

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 4.7.

Table 4.7 Updated Construction Cost

Phase	Section		Station		Structure		Length m	Width m	Area m ²	Unit cost (mil. Rp/m ²)		Const' cost Mil. Rp	F/C 1000 JPY	L/C Mil. Rp	
			from	to	Superstructure	Substructure				main road	ramp				
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 (continuous)	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+941.26 1	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		

4.3.4 Land Acquisition Cost

Estimated cost of land acquisition is shown in the Table 4.8.

Table 4.8 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)
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 4.9.

Table 4.9 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 Maintenance Cost

The indicative costs for maintenance of TgPA is estimated, based on the unit costs at current price per kilometer per annum for principal maintenance activities, which include routine maintenance and periodic maintenance such as repair and rehabilitation works. The unit costs to be applied for principal maintenance items are estimated based on the maintenance data of PT.Jasa Marga.

The estimated unit maintenance cost is presented in Table 4.10.

Table 4.10 Unit Maintenance Cost Estimation

Items	2008 (Mill Rp. / year)	2007 (Mill. Rp. / year)
Routine Maintenance	413,820	344,909
Periodical Maintenance	21,726	18,772
Total	435,546	363,680

Total Length Toll Road (km)	496
Maintenance Cost (Average)	
Routine (Mill.Rp.)	765
Periodical (Mill.Rp.)	41

Souse : Annual report 2007 and 2008, PT. Jasa Marga

The maintenance cost for each section is estimated in Table 4.11.

Table 4.11 Maintenance Cost of Each Section

Section	Items	Unit	Qty (km)	Unit Cost	Amount (Mill.Rp./year)
E-1	Routine	km	3.4	765	2,600
	Periodical	km	3.4	41	139
E-2	Routine	km	2.74	765	2,096
	Periodical	km	2.74	41	112
E-2A	Routine	km	1.92	765	1,469
	Periodical	km	1.92	41	78
NS-Link	Routine	km	2.24	765	1,713
	Periodical	km	2.24	41	91
W-1	Routine	km	2.36	765	1,805
	Periodical	km	2.36	41	96
W-2	Routine	km	2.91	765	2,226
	Periodical	km	2.91	41	119
Direct Ramp	Routine	km	1.1	765	841
	Periodical	km	1.1	41	45

4.4.3 Operation Cost

The indicative costs for operation of TgPA is estimated, based on the unit costs at current price per traffic volume per annum for operation including the toll collection expenses, toll road services and administration expenses. The unit costs to be applied for principal operation items is estimated based on the operation data of PT.Jasa Marga.

The annual expenditure for operation cost of PT.Jasa Marga is shown in Table 4.12.

Table 4.12 Unit Operation Cost Estimation

Items	2008 (1000 Rp. / year)	2007 1000 Rp. / year
Toll Collection Expenses	517,017,722	417,862,845
Toll Road Service Expenses	190,211,911	165,394,844
General and Administrative Expenses	581,242,618	481,387,365
Total	1,288,472,251	1,064,645,054

Total Traffic Volume (1000 vehicles)	880,057	859,321
Average Operating Cost (1000 Rp/1000 vehicles)	1,352	

Souse : Annual report 2007 and 2008, PT. Jasa Marga

Total operation cost for structures including E-1, E-2, E-2A, NS-Link, W-1, W-2 and Direct Ramp are estimated based on forecasted traffic volume in 2016, using the above unit operation cost. Furthermore, the operation cost of each section is divided proportionally based on each operating length as shown in Table 4.13.

Table 4.13 Operation Cost for Each Section

Section	Operating Length (km)	Operation Cost (Mill.Rp./km)
E-1	3.40	18,110
E-2	2.74	14,595
E-2A	1.92	10,227
NS-Link	2.24	11,932
W-1	2.36	12,571
W-2	2.91	15,500
Direct Ramp	1.10	5,859
TOTAL	16.67	88,794

4.4.4 Initial Construction Cost of Operating Facilities

The initial construction costs for operation facilities such as toll gate, communication line and operation center are estimated, based on the costs data of TgPA Phase 1. The summary of construction cost for these facilities is shown in Table 4.14.

Table 4.14 Summary of Construction Cost of Operation Facilities

Section	Cost of Facilities (Mill. Rp.)
E-1	13,198
E-2	14,218
E-2A	8,759
NS-Link	9,719
W-1	13,079
W-2	11,728
Direct Ramp	3,299
Total	74,000

Souse : E-1 section of TgPA Phase I

4.4.5 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 4.15.

Table 4.15 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

5.1.1 Outline

In addition to the economic valuation, the financial valuation should be conducted in estimating the Project effects, considering the roads are tollways. The basic method of estimation is as follows:

- Target period of estimation: Normally, it is determined according to the length of the construction period and physical life of roads. Generally, it would be 25-30 years. A project life of 30 years was adopted as it was settled in the prior estimation of the loan.
- Social discount rate: In principle, the discount rate of a project is based on the concept of the opportunity cost of capital. However, the discount rate set by recipient countries in the feasibility studies or provided in the guidelines of the aid agencies is commonly applied in practice. We adopted 15% -- the rate that is generally accepted in Indonesia.
- Economic valuation indices: Net present value (NPV), benefit cost ratio (B/C), and economic internal rate of return (EIRR) were estimated. Calculation methods and characteristics of each index are indicated in the following table.

Table 5.1 Principal indices of cost effect analysis and their characteristics

Index of Evaluation	Definition	Characteristics
Net Present Value (NPV)	$\sum_{t=0}^n \frac{B_t - C_t}{(1+r)^t}$	Adapted for comparing the size of net benefit of implementing the project.
Cost Benefit Ratio (CBR)	$\frac{\sum_{t=0}^n B_t / (1+r)^t}{\sum_{t=0}^n C_t / (1+r)^t}$	Adapted for comparing the investment efficiency of the project by the size of benefit per unit of investment.
Internal Rate of Return (IRR)	$(r_0) \text{ for which } \sum_{t=0}^n \frac{B_t - C_t}{(1+r_0)^t} = 0$	Adapted for judging the investment efficiency of the project through the comparison with the social discount rate.

Note that n: evaluation period, B_t : benefit of year t, C_t : cost of year t, r: social discount rate

- In the economic and financial valuation, the respective cost and benefit are as follows:

	Economic Evaluation	Financial Evaluation
Cost	Project cost (excluding taxes), the maintenance and operation cost	Project cost, the maintenance and operation cost
Benefit	Cut down of the transport cost and saving in the traveling time	Toll and other operating income (advertising revenue, etc.)

Market price is applied in the financial valuation while economic price is applied in the economic valuation. Since the cost estimation is ordinarily implemented with the market price, it is necessary to convert the market price into the economic price. Major conversion procedures are carried out in the following two stages:

- 1) Exclude the transfer items: deduction of the transfer items such as taxes, interests, and subsidies, and
- 2) Convert labor and land prices into economic prices: estimation based on the opportunity cost of labor and land if the project is not implemented.

In Indonesia, 85% of the market price is regarded as the economic price on an empirical basis. Thus, we applied this transformation coefficient in the research as well to convert the market price into the economic price.

5.1.2 Economic 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 5.2 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 course of bidding.
With Project	Alternative 1	Alternative in which only the section W1 and W2, 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 W1, W2 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.

(2) Estimation of the Vehicle Operating Cost

Operating cost differs according to the running speed of the car. The difference between the case when the project is implemented (“with” case) and the case when project is not implemented (“without” case) is deemed as the benefit. VOCs shown in Table 5.3 are 2005 estimates, which are used in the preliminary survey for the construction of the intra urban toll road in Bandung City. We converted these estimates into July 2010 costs. The rate of increase in consumer price index (which is assumed at 1.469 times (=1.08⁵) using the average annual rate of 8% between 2006 and 2008), which is indicated in the documents published by the Indonesian Statistical Bureau, was applied in the conversion.

Table 5.3 Vehicle Operating Cost (As of 2005)

Unit: Rupiah per vehicle-km

Speed (km/h)	Motor Cycle	Passenger Car			Bus			Truck	
		Sedan	Van	Pick-up	Small	Medium	Large	S/M	Large
10	404.14	4,862.28	2,081.80	1,600.99	1,950.62	2,027.19	2,946.79	2,558.22	3,937.40
15	320.99	3,622.22	1,581.52	1,216.52	1,526.32	1,559.27	2,280.63	1,947.25	3,032.15
20	274.15	2,968.02	1,312.71	1,009.50	1,299.68	1,324.42	1,947.99	1,638.77	2,575.94
25	243.08	2,554.56	1,140.24	876.26	1,156.49	1,185.77	1,753.55	1,454.88	2,305.81
30	220.87	2,265.84	1,018.43	782.42	1,058.25	1,097.49	1,632.03	1,335.84	2,133.05
35	204.55	2,056.18	927.80	712.58	988.41	1,039.51	1,555.17	1,255.76	2,019.58
40	192.56	1,886.49	858.11	659.43	938.63	1,001.88	1,508.76	1,201.59	1,945.64
45	184.04	1,755.75	803.64	618.29	904.08	979.04	1,484.74	1,166.01	1,900.55
50	178.49	1,650.63	761.04	586.81	882.12	967.48	1,478.16	1,144.34	1,877.27
55	175.55	1,565.27	727.95	563.09	870.85	965.28	1,486.06	1,133.95	1,871.85
60	174.97	1,496.02	702.91	545.96	868.94	970.55	1,506.27	1,132.63	1,880.93
65	176.63	1,439.80	684.61	534.69	875.53	982.77	1,537.31	1,139.07	1,902.89
70	180.38	1,394.85	696.77	528.54	890.03	1,000.71	1,578.15	1,152.39	1,935.83
75	186.12	1,430.28	715.94	527.08	911.99	1,023.99	1,627.79	1,171.72	1,978.73
80	193.79	1,458.54	737.61	530.15	941.12	1,052.25	1,685.76	1,196.46	2,030.85
85	203.35	1,479.91	763.09	537.18	976.99	1,085.19	1,751.80	1,226.33	2,091.47
90	214.74	1,495.58	797.93	548.31	1,019.45	1,122.53	1,825.15	1,260.88	2,159.66
95	227.93	1,501.43	847.71	562.95	1,068.35	1,163.96	1,905.82	1,299.68	2,236.12
100	242.89	1,502.17	919.45	581.25	1,123.55	1,209.49	1,993.52	1,342.87	2,319.43

Source: Final Report for Preparatory Survey for Bandung Intra Urban Toll Road Project

(3) Valuation of the Travel Time Cost (TTC)

TTC is the monetary value of saved time that could be spent for additional work or leisure. The income approach is commonly used to estimate the value of time. In this method, free time is assumed to be spent for productive activities. The value per hour is evaluated via wage, household income, GDP per capita, etc.

Not all saved time has value. In principle, the value of time which is used for productive activities is assessed as the benefit. In transportation projects, time of trips to work is counted as benefit. Usually, however, time of trips for other purposes are also considered as benefit, but partially less than the value of trips for work purpose. The World Bank considers that approximately 30% of the value of trips for work purposes can be reasonably set as the value of trips for other purposes according to prior experiences in research.

The following table shows the evaluated value of time, which is estimated through income approach, as of 2010, in Jakarta City. In this research, purposes of trips are classified into "work" and "others". Work purpose trips account for 25% of all trips and the estimated value of time of these trips is estimated to be four times of the average value. In addition, the financial price of the trips is multiplied by 85 %, to convert it into economic price. Moreover, for passenger vehicles, the value is tripled because an average of three passengers is assumed per vehicle.

Table 5.4 Calculation of estimated value of time

2009:	Rp. 82,079,960/year (Per Capita GRDP at Current Market Price by Provinces)	
2010:	Rp. 88,646,357/year	(Rp. 82,079,960x1.08)
(Business)		
Rp. 88,646,357/ (12 x 200 hr/month) x 0.85 x 4.0		= Rp. 125,582/hour/person
25% x Rp. 125,582		= Rp. 31,396/hour/person
Non-buisness:		
Rp. 88,646,357/ (12 x 200 hr/month) x 0.85		= Rp. 31,396/hour/person
75% x Rp. 31,396		= Rp. 23,547/hour/person
Vehicle Time Value (Economic)		
	(Rp. 31,396 + Rp. 23,547)	= Rp. 54,942/hour/person
	Occupance per-veh: 3.0	x 3
		= Rp. 164,827/veh-hour

(4) Economic Valuation

1) Economic Benefit

Table 5.5 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 NS 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 5.5 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. Direct 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 5.6 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 2052.5		0.0	0.0
2009 5935.3		0.0	0.0
2010 7105.3		0.0	0.0
2011 15,974.4	4	528.0	127.2
2012 11,270.2		1,432.6	968.5
2013 2963.4		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 5.7 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 5.8 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 NS Direct Ramp plus the added W section, is the most desirable overall plan.

Table 5.9 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

4) Sensibility Analysis

In Alternative 3, which is assessed as the most desirable plan, the variation of EIRR in terms of changing benefits and costs is shown in Table 5.9. Even if benefits only are decreased by up to 10% and costs alone are raised up to 20%, the plan remains feasible.

Table 5.10 Sensibility analysis of the economic valuation (EIRR)

		Benefit			
		Base	- 10%	- 20%	- 30%
Cost	Base	18.5%	16.7%	14.8%	12.9%
	+ 10%	16.9%	15.2%	13.4%	11.6%
	+ 20%	15.5%	13.9%	12.1%	10.4%
	+ 30%	14.3%	12.7%	11.1%	9.4%

Note that the parts filled by hatching indicate the range of feasibility.

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 5.11 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 a round 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 5.11 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

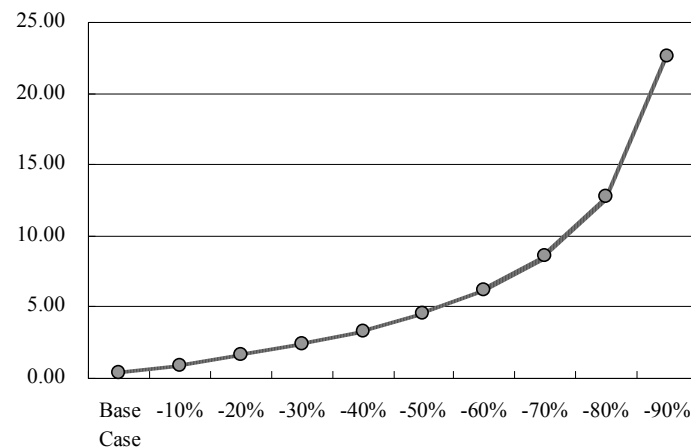


Figure 5.1 Sensibility analysis of the financial valuation (FIRR)

5.2 Estimation of Performance Indicators

Tables 5.12 and 5.13 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, traffic 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.

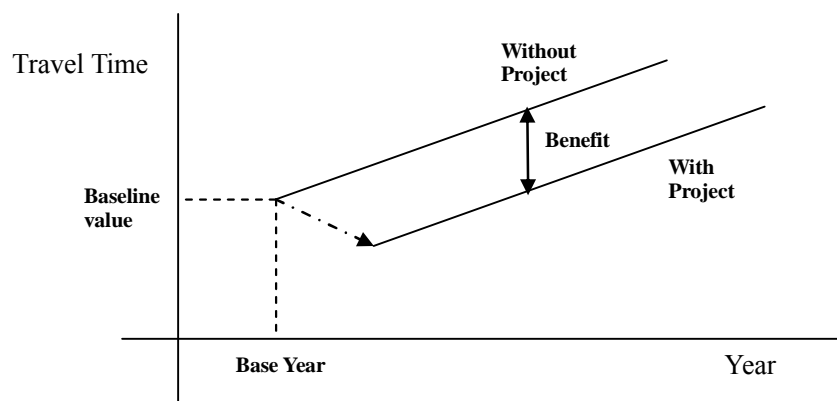


Table 5.12 Estimation of Performance Indicators (Traffic Volume)

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

Table 5.13 Estimation of Performance Indicators (Travel Time from Tanjung Priok Port)

201	Base year (minutes)	Target value (minutes)		
	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

The Tanjung Priok Access Road (TgPA) Project is one part of the Jakarta Outer Ring Road (JORR) development. The TgPA toll road consists of the following sections; E-1, E-2, E-2A (East), NS Link, Direct Ramp, W-1 and W-2 (West). 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 reference of compensation is a barter which must be completed before 30 September 2010, and the construction will start in November 1 st , 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 from 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. Outline of the procedures of land acquisition in the public facility development project is shown in the figure in the next page.

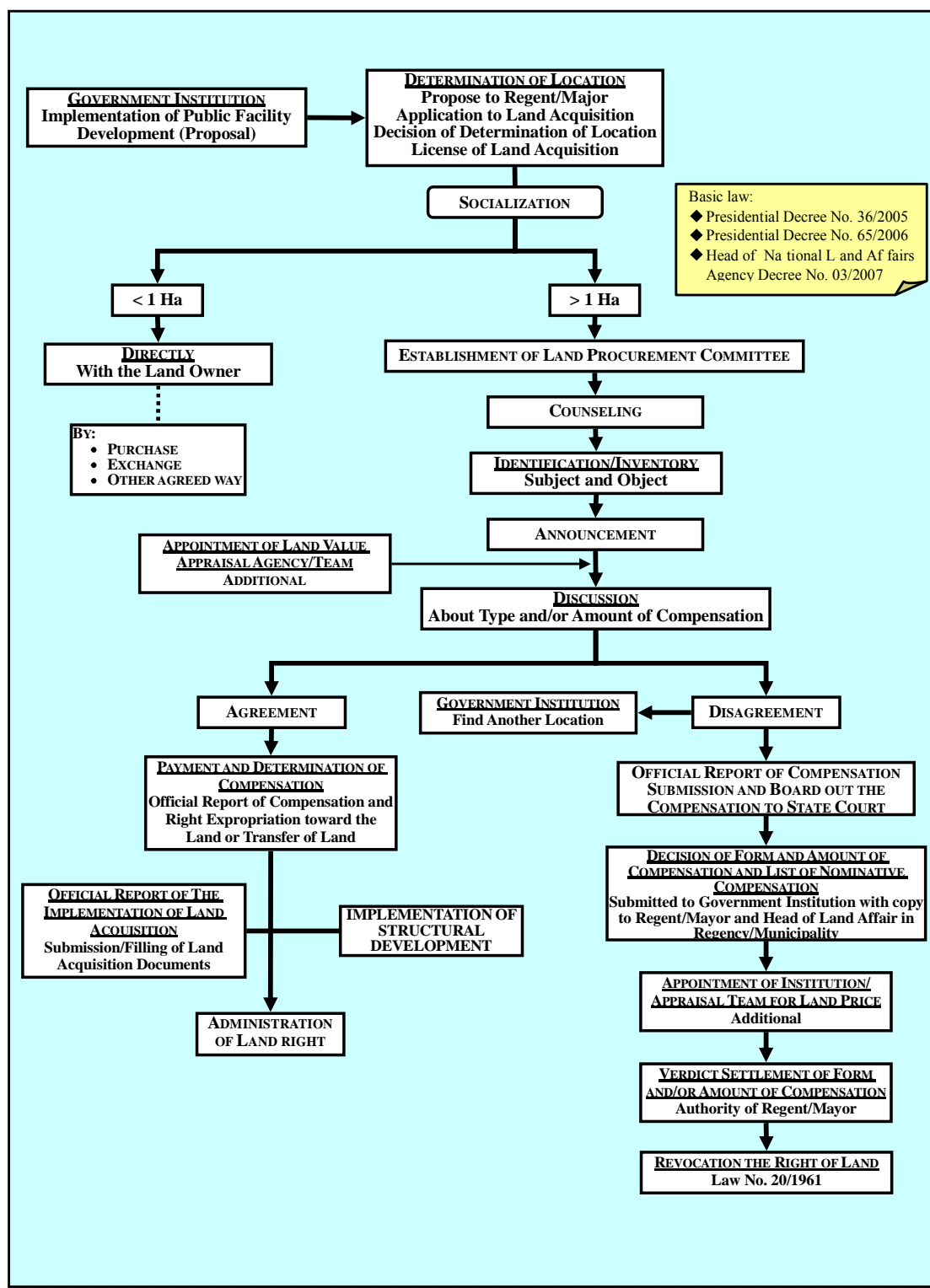


Figure 6.1 Procedure of Land Acquisition for the Implementation of Public Facility Development

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: m²)

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	1,223	652	352	3,574	3,674	14,705	161,886

6.2.1 Resettlement and Relocation for the Direct Ramp

With the implementation of the TgPA Project, some of the landowners in the Project area are to be relocated or resettled. As shown in Table 6.2 above, almost all of the land to be acquired for the planned Direct Ramp area is occupied by the private sector including private households. According to the environmental impact assessment (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 6.3.1 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.

The EIA review report also identified the land owned by the private sector and acquired by Bina

Marga. Table 6.3.2 below gives the details of the land acquired in the NS Link construction area.

Table 6.3.2 Data of Land Acquisition in NS Link Area (Private Sector)

No.	Sta.	Land Use Location	Land (m2)	No.	Sta.	Land Use Location	Land (m2)
Left				Right			
1	0+792 – 0+847	Parking Kebun Bawang village	193	1	0+075 – 0+180	Parking Rawa Badak village	331
2	0+856 – 0+912	Parking Kebun Bawang village	317	2	1+025 – 1+072	Shop Koja Selatan	475
3	0+918 – 0+970	Parking Kebun Bawang village	461	3	1+075 – 1+120	Shop Koja Selatan	602
4	0+975 – 1+025	Parking Kebun Bawang village	327	4	1+124 – 1+168	Shop Koja Selatan	631
5	1+028 – 1+073	Parking Kebun Bawang village	204	5	1+172 – 1+220	Shop Koja Selatan	706
6	1+075 – 1+120	Office Kebun Bawang village	220	6	1+224 – 1+262	Shop Koja Selatan	724
7	1+124 – 1+170	Office Kebun Bawang village	179	7	1+280 – 1+317	Shop Koja Selatan	557
8	1+174 – 1+221	Office Kebun Bawang village	147	8	1+320 – 1+364	Shop Koja Selatan	957
9	1+280 – 1+317	Office Kebun Bawang village	177	9	1+367 – 1+410	Shop Koja Selatan	637
10	1+320 – 1+364	Office Kebun Bawang village	278	10	1+414 – 1+453	Shop Koja Selatan	298
11	1+367 – 1+364	Parking Kebun Bawang village	350	1	1+476 – 1+670	Shop Koja Selatan	2,042
			12		1+675 – 1+735	Shop Koja Selatan	1,048
			13		1+737 – 1+775	Shop Koja Selatan	478
			14		1+777 – 1+900	Shop Koja Selatan	233
			15		1+902 – 1+960	Shop Koja Selatan	110

As for the number of households and institutions which require resettlement/relocation in the E-2 section, 134 households and 15 institutions were identified in total during D/D stage.

6.2.2 Background of the Environmental Requirements of the Project

In Indonesia, implementation of the EIA is required for large-scale public facility development such as construction of toll roads according to Government Regulation No. 27/2009. The kind and scale of public facility developments or projects are prescribed under Ministerial Decree of Environment No. 11/2006.

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	W1 (Penjaringan - Kebon Jeruk)
2	E2 (Cikunir – Cakung)
3	E3 (Cakung – Cilincing)
4	TgPA Access (E-1, E-2, E-2A, NS, W-1, W-2)

Loan Agreement (JBIC Loan IP-529) for TgPA Construction Project (I) was signed on 31 March, 2005 and became effective on 28 July, 2005. After the Loan Agreement, the Directorate General of Highway (DGH), which is the implementing agency of the Project, procured a consultant for the Consultancy Services for the Project Phase I. Accordingly, the D/D of the Project was carried out from January 2007 to March 2008. After the completion of the D/D until now, construction of E-1 section, among 6 packages of the Project, has been completed. Even though the EIA approval for the TgPA Construction Project was issued based on the F/S, the scope and design of the Project have been slightly changed in the D/D.

6.2.3 Necessity of Implementation of New EIA

Together with the change of the scope and magnitude of the Project as well as the change of the environmental conditions in the project area, Government Regulation No. 27/1999 prescribes the expiration date and invalidation of the EIA document if the project is not implemented after three years from the issuance of the approval letter. Government Regulation No. 27/1999 also requests the implementation of new/additional EIA if the initiating party changes any of the following: location, design, process, capacity, materials, auxiliary materials of the project/activity as well as if there is a basic environmental change as a result of a natural event or other causes prior to and at the time of the implementation of the concerned project. In this regard, it is being discussed whether new/additional EIA shall be conducted or not in accordance with relevant government regulations since environmental approval based on the scope and magnitude of the Project under the F/S had been issued in December 2004. Table 6.5 below summarizes the comparison and major differences between the F/S and D/D from the viewpoint of environmental considerations.

Table 6.5 Comparison of F/S and D/D from Viewpoint of Environmental Consideration

Category		F/S	D/D	Major Differences																																																						
Project area																																																										
	Project border	Project border of TgPA Access was along 12.08 km (15.07 km) lengths which was started from Cilincing Junction and ended in Jl. RE. Martadinata. The project consisted of three sections i.e East Section 8.05 km, West Section 3.65 km and NS extension 0.38 km. It is noted that Road Length as per F/S was only considered the length of ‘main road’ and didn’t consider the ramp length. Noted that main road without ramp is only counted in F/S for road length. Hence, figure in () above is counted as same as in D/D	The latest project border of TgPA Access was a alongside length 16.67 km which was started from Cilincing Junction and ended in Jl. RE. Martadinata, beginning and end points are the same as the original design. The project length consists of three sections i.e one is East Section (E-1 and E-2) (6.14 km), two consist of part of East Section (E-2A) plus NS Link and NS direct Ramp (5.26 km) and three is West Section (5.27 km).	Different compared with the original is 1.6 km consisting of 0.5 km of additional NS Link and 1.10 km of NS Direct Ramp.																																																						
	Ecological border			No change																																																						
	Social border	Social border is area along the project activity which may cause adverse effect to local social activities (induce significant impact). The area being considered as a severe social impact especially is settlement area that will be acquired i.e. Cilincing Sub District (Kelurahan Kalibaru,); Koja Sub District (Kelurahan Koja) and Kelurahan Lagoa).	The social border is the same with social border in the F/S NS direct ramp location, i.e. around Kelurahan Raw a Badak Selatan, Rawa Badak Utara and Kelurahan Kebun Bawang. But the alignment of TgPA in D/D is planned just to pass only the edge of these additional five (5) Villages.	Additional 5 villages																																																						
	Administrative border	Administrative border of TgPA Project at Municipal level is North Jakarta and those at Village level is defined in the Table 6.5.1 Administrative Border of TgPA Project (per F/S) below: Table 6.5.1 Administrative Border of TgPA Project (per F/S) <table><tr><th>No</th><th>Village (Kelurahan)</th><th>Sub District</th></tr><tr><td>1 Su</td><td>kapura</td><td rowspan="4">Cilincing</td></tr><tr><td>2 Ro</td><td>rotan</td></tr><tr><td>3 Se</td><td>mper Timur</td></tr><tr><td>4 Se</td><td>mper barat</td></tr><tr><td>5 K</td><td>ali Baru</td><td rowspan="2">Koja</td></tr><tr><td>6 K</td><td>oja</td></tr><tr><td>7 L</td><td>agoa</td><td rowspan="2">Tanjung Priok</td></tr><tr><td>8</td><td>Tanjung Priok</td></tr></table>	No	Village (Kelurahan)	Sub District	1 Su	kapura	Cilincing	2 Ro	rotan	3 Se	mper Timur	4 Se	mper barat	5 K	ali Baru	Koja	6 K	oja	7 L	agoa	Tanjung Priok	8	Tanjung Priok	The latest administrative border of TgPA is the same as the F/S border except addition of administration border where NS-direct ramp is located. Detailed descriptions of administrative border are shown in Table 6.5.2 below: Table 6.5.2 Administrative Border of TgPA Project (per D/D) <table><tr><th>No</th><th>Village (Kelurahan)</th><th>Sub District</th></tr><tr><td>1 Su</td><td>kapura</td><td rowspan="4">Cilincing</td></tr><tr><td>2 Ro</td><td>rotan</td></tr><tr><td>3 Se</td><td>mper Timur</td></tr><tr><td>4 S</td><td>emper barat</td></tr><tr><td>5 K</td><td>ali Baru</td><td rowspan="3">Koja</td></tr><tr><td>6 K</td><td>oja</td></tr><tr><td>7 L</td><td>agoa</td></tr><tr><td>8</td><td>Rawa Badak Utara</td><td rowspan="6">Tanjung Priok</td></tr><tr><td>9</td><td>Rawa Badak Selatan</td></tr><tr><td>10</td><td>Tanjung Priok</td></tr><tr><td>11</td><td>Kebon Bawang</td></tr><tr><td>12</td><td>Papanggo</td></tr><tr><td>13</td><td>Sungai Bambu</td></tr></table>	No	Village (Kelurahan)	Sub District	1 Su	kapura	Cilincing	2 Ro	rotan	3 Se	mper Timur	4 S	emper barat	5 K	ali Baru	Koja	6 K	oja	7 L	agoa	8	Rawa Badak Utara	Tanjung Priok	9	Rawa Badak Selatan	10	Tanjung Priok	11	Kebon Bawang	12	Papanggo	13	Sungai Bambu	Additional 5 villages (see Table left)
No	Village (Kelurahan)	Sub District																																																								
1 Su	kapura	Cilincing																																																								
2 Ro	rotan																																																									
3 Se	mper Timur																																																									
4 Se	mper barat																																																									
5 K	ali Baru	Koja																																																								
6 K	oja																																																									
7 L	agoa	Tanjung Priok																																																								
8	Tanjung Priok																																																									
No	Village (Kelurahan)	Sub District																																																								
1 Su	kapura	Cilincing																																																								
2 Ro	rotan																																																									
3 Se	mper Timur																																																									
4 S	emper barat																																																									
5 K	ali Baru	Koja																																																								
6 K	oja																																																									
7 L	agoa																																																									
8	Rawa Badak Utara	Tanjung Priok																																																								
9	Rawa Badak Selatan																																																									
10	Tanjung Priok																																																									
11	Kebon Bawang																																																									
12	Papanggo																																																									
13	Sungai Bambu																																																									

Category	F/S	D/D	Major Differences																																									
Project design	<p>The project consists of three sections i.e. East Section along 8.05 km West Section (3.65 km) and NS extension (0.38 km), so the total length is 12.08 km.</p> <p>In the Original Design in F/S, the ‘main road’ only is considered in the length and ramp length wasn’t considered in the NS extension. It is noted that the main road only is counted as road length in F/S.</p>	<p>In the D/D stage, the TgPA Project was divided in the three phase i.e. Phase 1 is East Section (E-1 (3.4 km) and E-2 (2.74 km)) with 6.14 km in total; Phase 2 consists of East Section (E-2A) plus NS Link with a total length of 4.16 km; and Phase 3 is West Section with 3.19 km. Total of length is become 11.75 km. The length different compared with the original is 0.33 km decreased in total and approx. 0.12 km increase to southward in NS link (location of toll gate) and increase of two numbers of junctions (JCT) at section E-1 and NS Link.</p>	<p>No significant change is made in the design per F/S (Original Design) and per D/D.</p> <p>The additional length which is not included in F/S but considered in the D/D phase is additional length of NS Direct Ramp 1.1 km and increase of two numbers of junctions (JCT) at section E-1 and NS Link.</p>																																									
<p>Table 6.5.3 Comparison of Project Scope between F/S and D/D</p> <table><tr><th rowspan="2">Section</th><th colspan="3">F/S</th><th colspan="3">D/D</th></tr><tr><th>Main road length (km)</th><th>I/C (Number)</th><th>Junction (Number)</th><th>Main road length (km)</th><th>I/C (Number)</th><th>Junction (Number)</th></tr><tr><td>Section - E</td><td>8.05</td><td>ON Ramp – 3 OFF Ramp – 3</td><td>8.</td><td>06</td><td>ON Ramp – 4 OFF Ramp – 3</td><td>ON Ramp – 1 OFF Ramp – 1</td></tr><tr><td>Section – W</td><td>3.65</td><td>ON Ramp – 2 OFF Ramp – 2</td><td>ON Ramp – 1 OFF Ramp – 1</td><td>3.19</td><td>ON Ramp – 1 OFF Ramp – 2</td><td>ON Ramp – 1 OFF Ramp – 1</td></tr><tr><td>Section – NS Link</td><td>0.38</td><td>ON Ramp – 1 OFF Ramp – 1</td><td>ON Ramp – 1 OFF Ramp – 1</td><td>0.50</td><td>ON Ramp – 1 OFF Ramp – 1</td><td>ON Ramp – 2 OFF Ramp – 2</td></tr><tr><td>Total</td><td>12.05 km</td><td>ON Ramp – 6 OFF Ramp - 6</td><td>ON Ramp – 2 OFF Ramp - 2</td><td>11.75 km</td><td>ON Ramp – 6 OFF Ramp - 6</td><td>ON Ramp – 4 OFF Ramp - 4</td></tr></table>				Section	F/S			D/D			Main road length (km)	I/C (Number)	Junction (Number)	Main road length (km)	I/C (Number)	Junction (Number)	Section - E	8.05	ON Ramp – 3 OFF Ramp – 3	8.	06	ON Ramp – 4 OFF Ramp – 3	ON Ramp – 1 OFF Ramp – 1	Section – W	3.65	ON Ramp – 2 OFF Ramp – 2	ON Ramp – 1 OFF Ramp – 1	3.19	ON Ramp – 1 OFF Ramp – 2	ON Ramp – 1 OFF Ramp – 1	Section – NS Link	0.38	ON Ramp – 1 OFF Ramp – 1	ON Ramp – 1 OFF Ramp – 1	0.50	ON Ramp – 1 OFF Ramp – 1	ON Ramp – 2 OFF Ramp – 2	Total	12.05 km	ON Ramp – 6 OFF Ramp - 6	ON Ramp – 2 OFF Ramp - 2	11.75 km	ON Ramp – 6 OFF Ramp - 6	ON Ramp – 4 OFF Ramp - 4
Section	F/S				D/D																																							
	Main road length (km)	I/C (Number)	Junction (Number)	Main road length (km)	I/C (Number)	Junction (Number)																																						
Section - E	8.05	ON Ramp – 3 OFF Ramp – 3	8.	06	ON Ramp – 4 OFF Ramp – 3	ON Ramp – 1 OFF Ramp – 1																																						
Section – W	3.65	ON Ramp – 2 OFF Ramp – 2	ON Ramp – 1 OFF Ramp – 1	3.19	ON Ramp – 1 OFF Ramp – 2	ON Ramp – 1 OFF Ramp – 1																																						
Section – NS Link	0.38	ON Ramp – 1 OFF Ramp – 1	ON Ramp – 1 OFF Ramp – 1	0.50	ON Ramp – 1 OFF Ramp – 1	ON Ramp – 2 OFF Ramp – 2																																						
Total	12.05 km	ON Ramp – 6 OFF Ramp - 6	ON Ramp – 2 OFF Ramp - 2	11.75 km	ON Ramp – 6 OFF Ramp - 6	ON Ramp – 4 OFF Ramp - 4																																						
Project location	<p>TgPA Project is located in the North Jakarta, and covered by three Sub Districts and eight Villages. The detailed names of the area where the TgPA Project located are situated are shown in the table 6.5.1.</p>	<p>The TgPA Project Location as per D/D is the same as that as per the F/S except addition of NS-direct ramp, i.e. located in the North Jakarta, covers three sub district and 13 Villages. The additional villages are where the NS direct ramp is located. The detailed name of the area where the TgPA Project is located is described in the table 6.5.2 above.</p>	<p>According to both descriptions about the project location in F/S and in D/D, it can be concluded that location per F/S is almost the same with location per D/D i.e. in the North Jakarta Municipality, three Sub Districts (Cilincing, Kojaya and Tanjung Priok). In the additional five Villages (Rawa Badak Selatan, Rawa Badak Utara, Kebon Bawang,</p>																																									

*Final Report
Special Assistance for Project Implementation for
The Tanjung Priok Access Road Project*

November 2010

Category	F/S	D/D	Major Differences																								
			Papanggo, a nd Sungai Bambu), R awa B adak Selatan, P apanggo and Sungai Ba mbu v illages are 'new' locations where NS d irect ram p are located. These areas h ave al ready covered i n t he areas studied in the EIA (2004).																								
Natural environmental conditions			There are no si gnificant changes i n the ph ysical environmental co nditions in the project area																								
Land use	The a rea to be passed the project roa d is m ostly s ettlement, t rading/commercial of fices, indu stries, w arehouse, a nd container depot/terminals.		There are no si gnificant changes i n l and u se around the TgPA location from the F/S stage in 2004 to D/D stage in 2008.																								
Land acquisition	A summary of area for the acquired land estimated during F/S and D/D is given below: <table><tr><th colspan="2">Table 6.5.4 Area of Land Acquisition Required as of F/S (m²)</th></tr><tr><th>Section</th><th></th></tr><tr><td>Section E</td><td></td></tr><tr><td>Section W</td><td></td></tr><tr><td>Section NS-Link</td><td></td></tr><tr><td>Total</td><td>185,300</td></tr></table> <table><tr><th colspan="2">Table 6.5.5 Area of Land Acquisition Required as of D/D (m²)</th></tr><tr><th>Section</th><th></th></tr><tr><td>Section E</td><td>120,240</td></tr><tr><td>Section W</td><td>33,358</td></tr><tr><td>Section NS-Link, Direct ramp</td><td>15,283</td></tr><tr><td>Total</td><td>168,881</td></tr></table> The l and a cquisition needed f or T gPA h ad been identified during F/S and t he t otal area of acquired land is decreased during D /D a s s hown i n Table 6.5.4 a nd T able 6.5.5 since final alignment was de cided t o minimize/avoid l and acquisition a nd other similar i mpacts d uring D/D. NS-direct ramp (0.23 Ha) which is a dditional to the original p roject le ngth i n the F /S req uires t he l and acquisition w ith area of only 0.4 Ha. Furthermore, this area is mainly owned by company and none by private.			Table 6.5.4 Area of Land Acquisition Required as of F/S (m ²)		Section		Section E		Section W		Section NS-Link		Total	185,300	Table 6.5.5 Area of Land Acquisition Required as of D/D (m ²)		Section		Section E	120,240	Section W	33,358	Section NS-Link, Direct ramp	15,283	Total	168,881
Table 6.5.4 Area of Land Acquisition Required as of F/S (m ²)																											
Section																											
Section E																											
Section W																											
Section NS-Link																											
Total	185,300																										
Table 6.5.5 Area of Land Acquisition Required as of D/D (m ²)																											
Section																											
Section E	120,240																										
Section W	33,358																										
Section NS-Link, Direct ramp	15,283																										
Total	168,881																										

*Final Report
Special Assistance for Project Implementation for
The Tanjung Priok Access Road Project*

November 2010

Category	F/S	D/D	Major Differences																															
Affected households	As stated above, the existing road and median along the project road namely Jalan Cilincing Raya dan Cakung-Cilincing Triangle is mainly used in the construction of TgPA. According to the F/S data the land acquired belong to private with small area, Pertamina, PT. KAI, PT. Pelindo, Navy, and also Government of DKI. After checked during D/D phase the owner of the acquired land is still same, just added one parcel land that owned by PT. PLN.																																	
	<p style="text-align: center;">Table 6.5.6 Number of Affected Household</p> <table> <tr> <th>No.</th><th>Number of affected households</th><th>Original (F/S)</th><th>D/D</th></tr> <tr> <td>1</td><td>E – 1 (Construction works)</td><td>118 HHs and 6 institutions Owners</td><td>156 HHs and 7 Institutions</td></tr> <tr> <td>2</td><td>E – 2</td><td>(PT. Pelindo (Harbor company), TNI</td><td>Owners (PT. Pelindo, TNI AL,</td></tr> <tr> <td>3 N</td><td>S link</td><td>AL (Navy), PT. KAI (Railway</td><td>PT. KAI, Pertamina, Pemda</td></tr> <tr> <td>4 W</td><td>– 2</td><td>company), Pertamina (Oil company),</td><td>DKI). PLN</td></tr> <tr> <td>5 W</td><td>– 1</td><td>Pemda DKI (Electricity company).</td><td></td></tr> <tr> <td>6</td><td>E – 2A</td><td>N/A</td><td></td></tr> <tr> <td>7</td><td>NS Direct Ramp (Harbor Road Junction)</td><td>N/A</td><td></td></tr> </table>		No.	Number of affected households	Original (F/S)	D/D	1	E – 1 (Construction works)	118 HHs and 6 institutions Owners	156 HHs and 7 Institutions	2	E – 2	(PT. Pelindo (Harbor company), TNI	Owners (PT. Pelindo, TNI AL,	3 N	S link	AL (Navy), PT. KAI (Railway	PT. KAI, Pertamina, Pemda	4 W	– 2	company), Pertamina (Oil company),	DKI). PLN	5 W	– 1	Pemda DKI (Electricity company).		6	E – 2A	N/A		7	NS Direct Ramp (Harbor Road Junction)	N/A	
No.	Number of affected households	Original (F/S)	D/D																															
1	E – 1 (Construction works)	118 HHs and 6 institutions Owners	156 HHs and 7 Institutions																															
2	E – 2	(PT. Pelindo (Harbor company), TNI	Owners (PT. Pelindo, TNI AL,																															
3 N	S link	AL (Navy), PT. KAI (Railway	PT. KAI, Pertamina, Pemda																															
4 W	– 2	company), Pertamina (Oil company),	DKI). PLN																															
5 W	– 1	Pemda DKI (Electricity company).																																
6	E – 2A	N/A																																
7	NS Direct Ramp (Harbor Road Junction)	N/A																																

(Source: BINA MARGA, EIA Review Report)

The comparison table above shows that 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 Raw a Badak Selatan, Raw a Bad ak 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 ANDAL 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 Kesanggupan Pengelolaan dan Pemantauan 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.

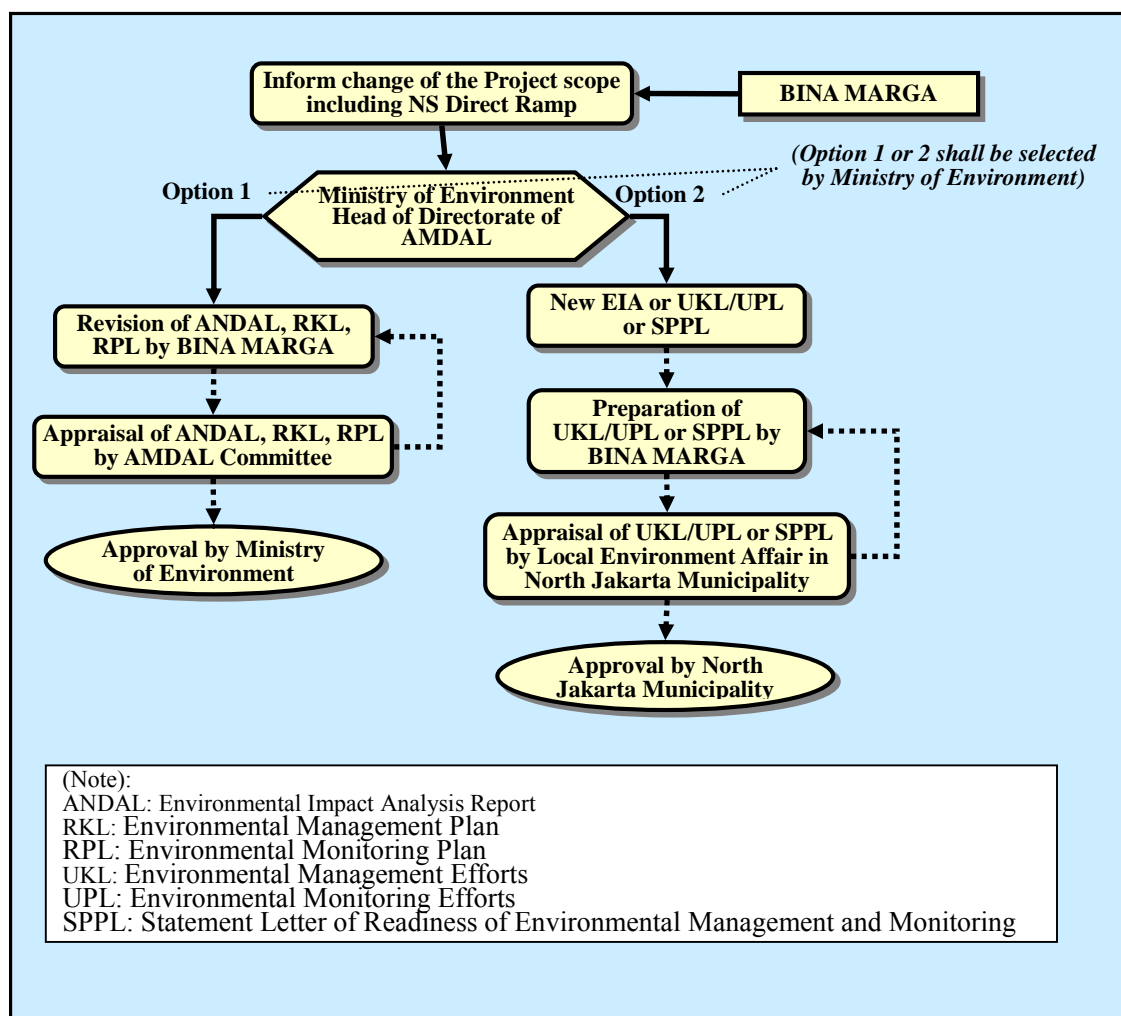


Figure 6.2 Actions Required for Bina Marga for Environmental Approval

- ◆ 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.

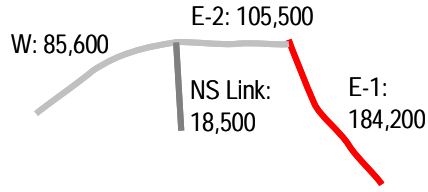
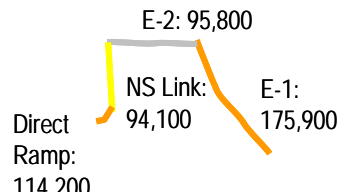
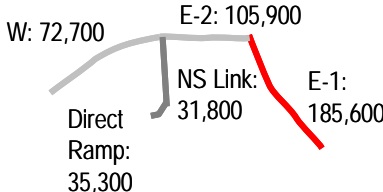
Consequently, the sections included in the alternative project scopes are as follows:

- 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	 <p>W: 85,600 E-2: 105,500 NS Link: 18,500 E-1: 184,200</p> <p>Almost balanced flows over network, except for NS Link with too much capacity allowance</p>	 <p>E-2: 95,800 NS Link: 94,100 E-1: 175,900 Direct Ramp: 114,200</p> <p>Much load to Direct Ramp and NS Link. Traffic over capacity after 2021 on Direct Ramp.</p>	 <p>W: 72,700 E-2: 105,900 NS Link: 31,800 E-1: 185,600 Direct Ramp: 35,300</p> <p>Reasonably balanced flows on most links</p>
Saturation Ratio	<p>More than 1.00 (Red line) 0.80 to 1.00 (Orange line) 0.60 to 0.80 (Yellow line) 0.40 to 0.60 (Grey line) Less than 0.40 (Dark grey line)</p>		
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

(1) General

There are two kinds of issues to be discussed in this section as follows:

- (i) Issues which are considered beyond the scope of examining the applicability of PPP for the TgPA Project alone, so that they are treated separately from the context of setting up PPP options; and
- (ii) Issues which are considered relevant for setting up PPP options for examining the applicability of PPP to the TgPA Project.

(2) Issues Beyond the Scope of Examining PPP Applicability

1) Intelligent Transportation System (ITS)

GOI has not yet formulated a national policy for the development of ITS for its road network. Therefore, appropriate requirement and standards for ITS could not be prepared for PPP tendering. Thus, the ITS element should be excluded from the examination of applicability of PPP.

2) Electronic Toll Collection (ETC)

As for ETC, the same rule above will be adopted ETC will be excluded from the examination since ETC application policy for JORR, as a whole or even combined with JIUT, has not been determined by GOI. In case it is required during the actual PPP tender, necessary conditions and specifications for ETC system could be easily prepared based on the current ETC system adopted for some toll gates in Indonesia.

3) Integrated Toll System for JORR

The double flat tariff system is now being contemplated for the integrated management of JIUT and JORR. There would be several operators involved for implementing this system which include Jasa Marga and CMNP for JIUT and Jasa Marga, JLJ (Jasa Marga), JLB and the new TgPA operator for JORR. There will be some uncertainty in the development of this system at the moment such as how to reach consensus among the operators, who would shoulder the required investment, how to set up a clearing house, how to determine the method of revenue apportionment, etc. However, the traffic forecast has been conducted on the basis of a double flat tariff system. Thus, the integrated toll system for JORR is considered as a prerequisite for examining the PPP scheme.

4) PPP for TgPA as Part of JORR or as Independent System

In the same manner as described above, the application of PPP to TgPA as part of JORR operation and management would require a number of issues to be solved before implementing the PPP tender. This includes the issue of integrated toll system, which is considered difficult to include in the scope of the PPP scheme. Thus, a possible choice at the moment is to examine TgPA as an independent section of JORR.

(3) Relevant Issues for Setting up PPP Options: Major Risks to be Transferred to the 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 up-front license fee payment. This monetization risk could vary from a simple O&M concession based on performance without any payment of the up-front license fee (no monetization) to a scheme in which the private sector concessionaire is obliged to pay the up-front license fee only and take all the other risks.

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 telecommunications 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
	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 viewpoints);
- (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

1) Assumption of Evaluation

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

2) Result of Evaluation

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.

(i) Option 1 (Long-term O&M Contract)

In this option, 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. Although the concessionaire makes initial investment with small risk assumption, it enjoys only a fixed level of profit and as far as profitability of the Project is concerned, this scheme is not attractive to the private sector. Project IRR is 16.9%; equity IRR is 18.0%; average DSCR is 1.47; and LLCR is 1.90.

(ii) Option 2 (Hybrid Option: Partial Monetization of Future Cash Flow and Risk Sharing between Public and Private)

In this option, 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 of Rp 2,401 billion, which is roughly JPY 24.3 billion (accounting for 41% of the abovementioned initial investment), 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. As a result, project IRR is calculated at 15.6% and equity IRR is 18.0%, which are sufficient for private sector investment. Evaluation criteria for financiers such as DSCR, which averages at 1.62, and LLCR, calculated at 2.13, are also evaluated to be satisfactory.

(iii) 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 of Rp 2,928 billion, which roughly equals JPY 29.6 billion (this amount accounts for 50% of the initial investment), by monetizing the future cash flow of the Project. 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). Evaluation results to a project IRR of 15.8% and equity IRR of 18.0%, which both satisfy the financial viability level for private sector investment. Evaluation criteria for financiers such as DSCR, which averages at 1.64, and LLCR, calculated at 2.13, are also evaluated to be satisfactory.

(3) Risk Transfer and Private Sector Participation (Private Sector Viewpoint)

(i) Option 1 (Long-term O&M Contract)

If performance standards are satisfied as stipulated in the O & M contract, there exists small assumption of risk by the private sector such as obligation of small initial investment for toll booths and others. Therefore, this option has the lowest risk transfer to the private sector among the three options. As risk transfer is smallest, participation of private sector is easy. However, due to small incentive for making profit, corresponding incentive to provide good service by the private sector becomes also small.

(ii) Option 2 (Hybrid Option: Partial Monetization of Future Cash Flow and Risk Sharing

between Public and Private)

Large monetization payment in terms of upfront license fee, obligation of investment for renewal, and profit sharing with the public sector during the concession period are the major elements of risk transfer. These are considered to be medium degree in extent. On the other hand, there exists a built-in risk hedging mechanism in this option such as the compensation guarantee on cash flow deficiency, which facilitates the participation of the private sector.

(iii) Option 3 (Full Monetization Option: License Fee of Whole Future Cash Flow and Full Risk Taking by Private Sector)

Majority of the project risks are transferred to the private sector and the degree of risk transfer in this option is the largest among the three options. There is no risk hedging mechanism such as compensation mechanism for cash flow deficiency. Therefore, the private sector needs careful and detailed analysis of the Project risks before its participation.

(4) Risk Transfer and Private Sector Participation (Government Viewpoint)

(i) Option 1 (Long-term O&M Contract)

If performance standards are satisfied as stipulated in the O&M contract, there exists small risk assumption by the private sector such as obligation of small initial investment for toll booths and others. All other project risks will be shouldered by the government. Therefore, risk transfer to the private sector is smallest from the government's viewpoint.

(ii) Option 2 (Hybrid Option: Partial Monetization of Future Cash Flow and Risk Sharing between Public and Private)

Large monetization payment in terms of upfront license fee, obligation of investment for renewal, and profit sharing with the public sector during the concession period are the major elements of risk transfer, which are considered to be medium degree in extent. On the other hand, compensation guarantee on cash flow deficiency is a risk to be assumed by the government.

(iii) Option 3 (Full Monetization Option: License Fee of Whole Future Cash Flow and Full Risk Taking by Private Sector)

Majority of the project risks are transferred to the private sector and the degree of risk transfer in this option is the largest among the three options. There is no risk hedging mechanism such as compensation mechanism for cash flow deficiency. Therefore, this is the largest risk transfer option for the government.

(5) Suitability to Current Regulatory Framework

(i) Option 1 (Long-term O&M Contract)

There already exists a similar long-term O&M contract for the O&M of the Surabaya-Madura Bridge Project. Therefore, this option is possible under the current legal and regulatory framework in Indonesia.

(ii) Option 2 (Hybrid Option: Partial Monetization of Future Cash Flow and Risk Sharing between Public and Private)

Since the regulatory framework for PPP concession contract is already prepared, it is possible to implement this option. However, there is no special account and system in Bina Marga for receiving the upfront license fee. Moreover, the shared profit and proceeds go directly to the national treasury. Thus, Bina Marga has no incentive to implement this option. Therefore, it is necessary to develop a mechanism for Bina Marga or the implementing agency who implements this option to receive the proceeds.

(iii) Option 3 (Full Monetization Option: License Fee of Whole Future Cash Flow and Full Risk Taking by Private Sector)

It is possible to implement this option as in Option 2 but has also the same problem for receiving the proceeds.

(6) Public Fund Availability

(i) Option 1 (Long-term O&M Contract)

This option has no upfront license fee payment from the private sector and the government needs to procure additional public funding for financing the construction of the entire section. Compared to other options, the government has additional financial burden under this option.

(ii) Option 2 (Hybrid Option: Partial Monetization of Future Cash Flow and Risk Sharing between Public and Private)

A large upfront license fee payment from the private sector mitigates the financial burden of the government.

(iii) Option 3 (Full Monetization Option: License Fee of Whole Future Cash Flow and Full Risk Taking by Private Sector)

A large upfront license fee payment from the private sector mitigates the financial burden of the government.

(7) Value for Money (VFM) and Benefit to Public Sector

VFM indicator, NPV of the government net cash flow and profitability index (PI) are calculated for each option.

(i) Option 1 (Long-term O&M Contract)

There is small risk transfer to the private sector and majority of the Project risks are shouldered by the government. NPV of the government net cash flow is Rp 1.820 billion, which is roughly equal to JPY 18.36 billion. This option has the second largest NPV among the three options. PI is calculated to be 0.59.

(ii) Option 2 (Hybrid Option: Partial Monetization of Future Cash Flow and Risk Sharing between Public and Private)

Considering state budget expenditure for the initial investment, repayment obligation for the ODA loan, revenue from the upfront license fee, tax revenue, guarantee on the compensation of cash flow deficiency, and profit sharing, the NPV is calculated as the value for money in implementing the TGPA Project. As a result, the NPV of this option is Rp 1,562 billion (roughly equivalent to JPY 15.8 billion), which is the largest (largest in VFM) among the three options. PI is calculated at 0.55. However, since the government's compensation guarantee is built-in, there will be a risk of contingent liability under this option.

(iii) Option 3 (Full Monetization Option: License Fee of Whole Future Cash Flow and Full Risk Taking by Private Sector)

In the same manner, NPV of Option 3 is calculated. As a result, the NPV is calculated at Rp 1,929 billion (roughly equals JPY 19.5 billion), which is the smallest (smallest in VFM) among the three options. PI is calculated at 0.45. However, since the private sector assumes major Project risks in this option, sensitivity analysis must be conducted to assess potential default and bankruptcy risk.

(8) 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				Eval uati on
		Risk Transfer	Risk Transfer	Fitting for Framework	Public Fund Availability	VFM	
Option 1 Long Term O&M Contract	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Smallest Risk Transfer <p>A</p>	<ul style="list-style-type: none"> Smallest Risk Transfer <p>C</p>	<ul style="list-style-type: none"> Possible as conducted for Sura-Madu Bridge <p>B</p>	<ul style="list-style-type: none"> Need to prepare additional public funding <p>C</p>	<ul style="list-style-type: none"> NPV of Govt CF: -1,820 B Rp (-18.3 B JPY) PI of Above: 0.59 <p>C</p>	C
Option 2 Hybrid Option	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Medium Risk Transfer Risk Hedging Mechanism and Private Sector Participation Possible <p>B</p>	<ul style="list-style-type: none"> Medium Risk Transfer <p>B</p>	<ul style="list-style-type: none"> PPP Framework is already Prepared Special Account Mechanism Needed for Bina Marga <p>B</p>	<ul style="list-style-type: none"> Large up front license fee is available <p>B</p>	<ul style="list-style-type: none"> NPV of Govt CF: -1,562 B Rp (-15.8 B JPY) PI of Above: 0.55 <p>A</p>	A
Option 3 Full Monetizat ion Option	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Largest Risk Transfer Detailed Assessment of Project Risks is Necessary for Private Sector Participation <p>C</p>	<ul style="list-style-type: none"> Largest Risk Transfer <p>A</p>	<ul style="list-style-type: none"> PPP Framework is already Prepared Special Account Mechanism Needed for Bina Marga <p>B</p>	<ul style="list-style-type: none"> Large up front license fee is available <p>A</p>	<ul style="list-style-type: none"> NPV of Govt CF: -1,929 B Rp (-19.5 B JPY) PI of Above: 0.45 <p>C</p>	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

In order to qualify for a Japanese ODA loan, the project cost must be broken down into the specified cost components. Utilizing the estimated costs in the previous chapters and the appropriate rates, 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.

The major assumptions used for the Project cost estimate are as follows:

- Physical contingency of the construction cost is assumed at 5% of the construction cost with reference to an example of TgPA project.
- Price escalation for F/C portion of the construction cost is assumed at 1.8 % p.a. considering recent price fluctuation in Japan.
- Price escalation for L/C portion of the construction cost is assumed at 7.9% p.a. considering recent price fluctuation in Indonesia.
- Physical contingency of the consulting services is assumed at 10% of the consulting services cost referring to examples of consulting services.
- Interest rate for the interest during construction is assumed at 0.2% p.a. with reference to recent interest rate of Japanese ODA STEP loan.
- Interest rate for the interest during consulting services is assumed at 0.01% p.a. with reference to recent interest rate of Japanese ODA loan.
- Rate for the commitment charge is assumed at 0.1%.
- Cost of land acquisition is derived from Table 4.8.
- Rate for the administration cost is assumed at 5.0%.
- Rate for the tax is assumed at 10.0%.

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	3, 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. The implementation structure is as shown in Figure 7.1.

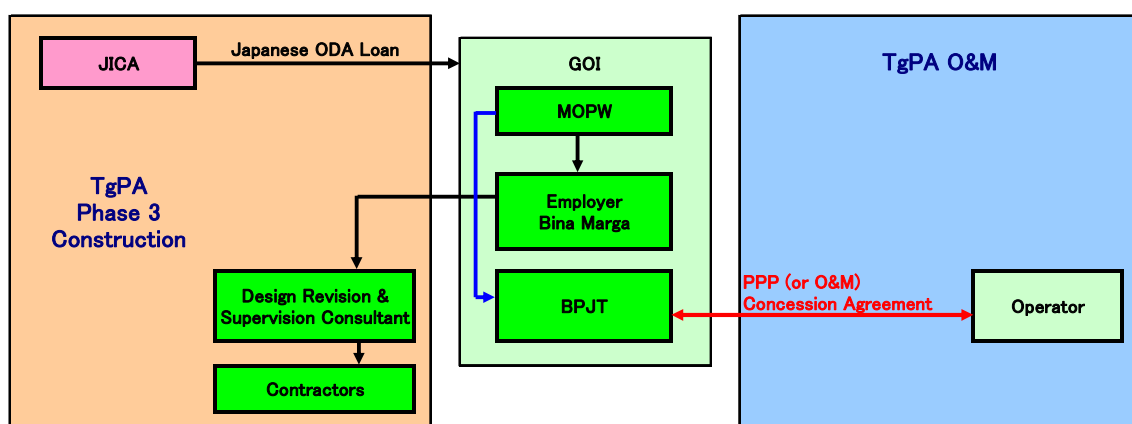


Figure 7.1 Implementation Structure

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 7.2.

A consulting firm to be in charge of the review of D/D, tender assistance, and construction supervision for Phase 3 will be selected by Bina Marga by February 2012, i.e., 11 months after the loan agreement. The total time for the review of D/D will be four months, starting from February 2012, while that for tender assistance is anticipated to be 15 months, ending in May 2013.

Bina Marga must initiate land acquisition and resettlement of affected people and properties by the end of 2010, allocating 24 months each for the Direct Ramp, W-1, and W-2. It shall conduct these activities with a three month interval between commencement dates and finish all of them in May 2013.

The procurement of contractors will start at the same time as the review of D/D in March 2012.

As in all Japanese ODA loans, the procurement will be implemented under an ICB basis and will comprise the prequalification and JICA concurrence period (four months); JICA concurrence on bidding documents (one month); bidding (three months); bid evaluation and JICA concurrence (three months); contract negotiation and JICA concurrence (three months); and opening of the letter of credit and issuance of the letter of commitment (one month). All these activities will total 15 months and will be conducted separately for the Direct Ramp, Phase 3 and Phase 4.

Based on these schedules, the construction of the Direct Ramp will start from August 2012 and be completed within 18 months in January 2014. Phase 3 will start from June 2013 and be completed within 27 months, i.e., up to August 2015.

According to the proposed schedule, Direct Ramp will be opened to traffic in February 2014, while Phase 3 will become operational in September 2015.

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

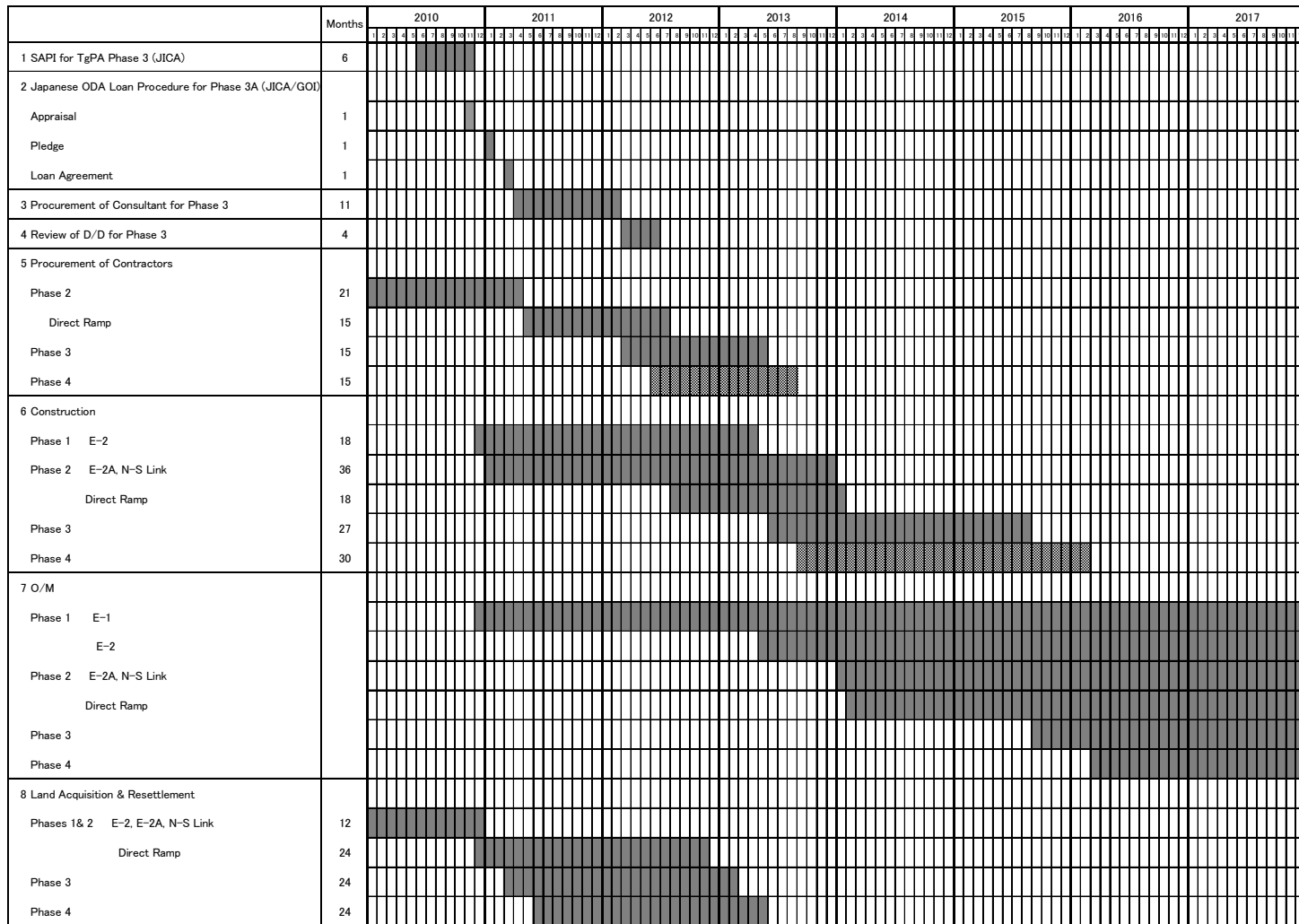
November 2010

Figure 7.2 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, including an update of the traffic database based on the actual traffic survey, network modification and update of OD tables necessitated by new development plans, and update of the toll road network and tariff system. 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. It was quantitatively verified that, among the compared cases, a network which enables more drivers' route selection is more desirable in terms of traffic volumes assigned over the network. 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 m² in total, comprising of 4,334 m², 24,606 m², and 3,958 m² for W-1, W-2, and Direct Ramp, respectively. The remaining area to be acquired for Phases 1 and 2 is 128,988 m².
- 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. Bina Marga has already completed the review and revision of the documents but not yet submitted them to the MOE. In accordance with the EIA approval procedure, Bina Marga must inform MOE of the change of the scope of the Project after the 2004 EIA. After that, MOE will take the next action.
- To develop an optimal project implementation plan, the alternative project scopes to be considered are the same as the cases for future traffic demand forecast described above, namely: Case 1 (W-1 and W-2 only), Case 2 (Direct Ramp only), and Case 3 (W-1, W-2, and Direct Ramp). The main features of these cases are shown in Table 7.1. Among these features is the construction cost, which is JPY 25.9 billion, JPY 2.0 billion, and JPY 27.9 billion for Cases 1, 2, and 3, respectively.
- 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.

APPENDICES

APPENDIX 1

RESULTS OF TRAFFIC SURVEY

1.1 TRAFFIC COUNT SURVEY

(1) Objectives

The objectives of the survey are;

- ✓ To understand the present traffic situation related to Tanjung Priok Port and the surrounding area
- ✓ To update the traffic demand forecast according to the current situation
- ✓ To calculate the present traffic volume to evaluate TgPA project effect

(2) Specification of Survey

To achieve the purpose, the survey was implemented at 7 (seven) locations nearby the Tanjung Priok port as shown in Table A1.1 and Figure A1.1.

Table A1.1 Survey location of traffic count survey

Location No	(section of TgPA)	Street	Section	Remarks
CO-1	W-2	Laks. R. E. Martadinata	Ancol-Pos 1 gate	Arterial
CO-2	W-1	Enggano	To Pos 8 gate	Arterial
CO-3	E-2A	Jampea	JICT gate – KOJA Gate	Arterial
CO-4	E-2	Jampea	KOJA Gate – Kramat Jaya	Arterial
CO-5	E-1	Cakung Cilincing	Toll barrier of Outer Ring Road	Highway + Arterial
CO-6	NS	Laks. Yos Sudarso	Toll barrier of N-S Link road	Highway + Arterial
CO-7	N-S Direct ramp	Harbor road	Tanjung Priok Ramp (on/off)	Highway ramp

Both directional traffic were counted at all survey point. The vehicle type was categorized into 11 types to consider the comparison of the survey result in Tanjung Priok Access Road Project in Phase I and Detail design for N-S Direct ramp, and to adjust the traffic assignment process for demand and forecast.

This survey was carried out for 24 hours (from 6:00 to 6:00) at all the survey point on weekday 1 day.



Table A1.2 to Table A1.13 shows the hourly traffic volume of each survey point.

Final Report

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

November 2010

Table A1.2 Traffic volume survey result at Location CO-1

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-1 Direction Code : A Surveyor Name
Date : July 22, 2010 Direction from : Ancol Weather : Clear
Day : Thursday Direction to : Tanjung Priok

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	2,199	113	67	11	16	2	9	50	22	16	4	310	2,509
07:00 - 08:00	2,987	205	138	16	21	25	22	26	25	27	8	513	3,500
08:00 - 09:00	2,161	210	84	11	15	25	16	46	17	25	16	465	2,626
09:00 - 10:00	1,299	135	115	11	14	59	27	58	28	29	15	491	1,790
10:00 - 11:00	1,563	166	91	9	11	65	53	67	18	26	18	524	2,087
11:00 - 12:00	1,163	189	84	8	15	72	35	68	36	39	31	577	1,740
12:00 - 13:00	1,062	154	62	7	13	39	35	54	18	44	27	453	1,515
13:00 - 14:00	998	268	76	7	11	57	69	58	37	51	17	651	1,649
14:00 - 15:00	1,385	286	104	8	13	31	81	92	30	66	31	742	2,127
15:00 - 16:00	1,370	264	99	9	14	52	50	54	19	77	20	658	2,028
16:00 - 17:00	1,593	275	98	11	15	31	28	35	20	89	22	624	2,217
17:00 - 18:00	2,647	275	109	9	20	23	27	22	33	96	18	632	3,279
18:00 - 19:00	1,617	270	128	13	16	23	24	31	24	68	15	612	2,229
19:00 - 20:00	1,234	188	110	13	17	13	13	35	25	78	38	530	1,764
20:00 - 21:00	1,365	167	103	8	8	19	4	24	29	62	31	455	1,820
21:00 - 22:00	773	134	70	10	9	9	11	20	14	56	26	359	1,132
22:00 - 23:00	749	81	46	1	2	3	8	25	14	49	16	245	994
23:00 - 24:00	457	102	11	0	1	9	9	10	16	35	18	211	668
24:00 - 01:00	117	39	5	0	0	1	6	9	13	37	28	138	255
01:00 - 02:00	189	34	2	0	0	1	5	7	16	11	14	90	279
02:00 - 03:00	124	28	3	1	0	5	3	3	7	18	3	71	195
03:00 - 04:00	86	23	5	5	0	2	1	8	19	17	10	90	176
04:00 - 05:00	167	31	12	6	2	2	6	11	15	16	12	113	280
05:00 - 06:00	243	41	38	10	10	3	3	27	24	23	8	187	430
Total Number of Vehicle													
24 hrs	27,548	3,678	1,660	184	243	571	545	840	519	1,055	446	9,741	37,289

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-1 Direction Code : B Surveyor Name
Date : July 22, 2010 Direction from : Tanhung Priok Weather : Clear
Day : Thursday Direction to : Ancol

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00	2,030	291	138	23	32	10	5	40	11	54	41	645	2,675
07:00 - 08:00	4,553	496	150	27	23	34	2	22	11	25	17	807	5,360
08:00 - 09:00	2,210	337	104	13	13	42	6	31	27	33	22	628	2,838
09:00 - 10:00	1,284	299	82	14	14	47	14	40	27	67	19	623	1,907
10:00 - 11:00	1,265	323	98	15	15	106	33	76	40	50	41	797	2,062
11:00 - 12:00	1,568	307	89	13	18	99	26	42	42	62	58	756	2,324
12:00 - 13:00	989	291	61	12	12	69	23	57	31	61	22	639	1,628
13:00 - 14:00	1,262	339	88	8	12	70	63	62	35	55	21	753	2,015
14:00 - 15:00	1,014	293	112	12	21	53	52	90	24	60	43	760	1,774
15:00 - 16:00	979	238	104	10	18	59	35	61	31	55	15	626	1,605
16:00 - 17:00	1,089	244	126	11	16	39	29	73	17	52	27	634	1,723
17:00 - 18:00	1,851	300	139	15	20	35	14	44	28	87	14	696	2,547
18:00 - 19:00	1,156	231	123	12	13	25	4	25	21	88	26	568	1,724
19:00 - 20:00	786	167	103	18	9	21	10	44	16	56	26	470	1,256
20:00 - 21:00	1,143	162	69	9	10	16	10	18	14	52	36	396	1,539
21:00 - 22:00	724	149	51	6	7	13	9	24	14	89	52	414	1,138
22:00 - 23:00	455	155	16	2	2	11	4	11	24	62	50	337	792
23:00 - 24:00	324	99	3	0	0	11	4	14	12	52	22	217	541
24:00 - 01:00	214	56	5	1	4	4	3	2	4	32	37	148	362
01:00 - 02:00	132	45	0	0	0	3	5	9	24	26	36	148	280
02:00 - 03:00	137	68	1	1	0	5	3	9	23	48	47	205	342
03:00 - 04:00	142	51	11	4	4	11	2	17	26	54	56	236	378
04:00 - 05:00	130	41	34	4	12	2	5	21	33	48	53	253	383
05:00 - 06:00	547	67	121	17	11	7	10	26	24	80	44	407	954
Total Number of Vehicle													
24 hrs	25,984	5,049	1,828	247	286	792	371	858	559	1,348	825	12,163	38,147

Table A1.3 Traffic volume survey result at Location CO-2

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-2 Direction Code : A Surveyor Name : Nanang & Arip & Ferdi
 Date : July 22, 2010 Direction from : Ancol Weather : Clear
 Day : Thursday Direction to : Jl.Yos Sudarso

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	1,022	132	240	56	77	5	20	11	14	21	5	581	1,603
07:00 - 08:00	1,506	187	321	65	86	24	21	3	13	13	4	737	2,243
08:00 - 09:00	1,545	201	247	57	73	30	19	6	8	15	10	666	2,211
09:00 - 10:00	1,571	217	230	52	66	62	29	14	13	22	11	716	2,287
10:00 - 11:00	1,389	249	180	44	59	39	32	10	13	25	17	668	2,057
11:00 - 12:00	1,495	308	239	40	72	77	37	9	12	24	19	837	2,332
12:00 - 13:00	1,358	257	187	39	66	50	44	9	11	27	17	707	2,065
13:00 - 14:00	1,287	263	159	37	59	50	61	5	14	37	12	697	1,984
14:00 - 15:00	1,622	344	239	36	59	41	57	16	39	42	20	893	2,515
15:00 - 16:00	1,623	337	162	40	57	70	67	28	17	51	13	842	2,465
16:00 - 17:00	1,786	342	172	48	62	61	56	18	21	32	8	820	2,606
17:00 - 18:00	2,034	247	167	26	55	32	38	23	18	37	7	650	2,684
18:00 - 19:00	2,352	293	306	49	62	26	28	15	8	41	9	837	3,189
19:00 - 20:00	1,696	265	191	44	58	13	13	21	15	33	16	669	2,365
20:00 - 21:00	1,330	163	183	40	43	14	3	22	17	40	20	545	1,875
21:00 - 22:00	1,112	169	157	25	24	9	11	6	19	43	20	483	1,595
22:00 - 23:00	709	101	95	9	17	4	12	13	18	33	11	313	1,022
23:00 - 24:00	600	119	32	0	9	5	5	21	27	50	26	294	894
24:00 - 01:00	424	86	16	0	3	3	15	16	15	24	18	196	620
01:00 - 02:00	281	73	17	4	2	1	8	9	4	9	11	138	419
02:00 - 03:00	235	40	10	3	0	6	3	6	6	26	4	104	339
03:00 - 04:00	151	27	10	11	0	5	3	5	8	5	3	77	228
04:00 - 05:00	165	47	25	19	5	5	13	13	10	11	8	156	321
05:00 - 06:00	479	49	105	32	31	20	15	9	6	18	6	291	770
Total Number of Vehicle													
24 hrs	27,772	4,516	3,690	776	1,045	652	610	308	346	679	295	12,917	40,689

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-2 Direction Code : B Surveyor Name : Sawal & Surono
 Date : July 22, 2010 Direction from : Jl. Yos Sudarso Weather : Clear
 Day : Thursday Direction to : Ancol

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00	2,017	191	238	53	72	8	4	3	12	20	15	616	2,633
07:00 - 08:00	3,279	384	286	73	62	13	0	9	8	16	11	862	4,141
08:00 - 09:00	2,608	375	242	55	58	28	3	10	8	25	17	821	3,429
09:00 - 10:00	2,076	296	206	57	56	44	13	13	10	28	8	731	2,807
10:00 - 11:00	1,619	314	188	65	69	49	15	13	15	24	20	772	2,391
11:00 - 12:00	1,321	267	152	35	47	41	23	14	22	27	25	653	1,974
12:00 - 13:00	1,361	321	169	50	50	57	19	10	18	53	19	766	2,127
13:00 - 14:00	1,797	304	212	42	60	56	50	17	18	27	10	796	2,593
14:00 - 15:00	2,246	291	213	38	64	42	41	16	18	25	18	766	3,012
15:00 - 16:00	2,625	275	224	43	77	72	43	21	16	46	13	830	3,455
16:00 - 17:00	2,549	210	183	35	48	47	35	13	12	19	10	612	3,161
17:00 - 18:00	2,339	274	224	38	51	41	17	2	17	30	5	699	3,038
18:00 - 19:00	1,437	190	181	42	45	35	5	4	21	27	8	558	1,995
19:00 - 20:00	1,264	157	123	46	22	22	11	18	20	50	23	492	1,756
20:00 - 21:00	1,066	153	154	32	34	18	11	16	22	70	48	558	1,624
21:00 - 22:00	802	193	115	17	22	23	15	12	32	56	33	518	1,320
22:00 - 23:00	509	175	54	11	8	26	11	3	38	63	51	440	949
23:00 - 24:00	579	110	19	2	4	21	8	2	33	40	17	256	835
24:00 - 01:00	567	120	21	1	5	19	17	9	30	35	40	297	864
01:00 - 02:00	220	85	15	3	2	7	10	5	25	20	27	199	419
02:00 - 03:00	204	93	10	7	0	10	7	3	26	26	25	207	411
03:00 - 04:00	295	92	5	10	10	7	1	5	16	31	32	209	504
04:00 - 05:00	205	115	42	8	25	5	13	9	19	26	29	291	496
05:00 - 06:00	532	94	73	44	27	11	15	10	13	37	20	344	876
Total Number of Vehicle													
24 hrs	33,517	5,079	3,349	807	918	702	387	237	469	821	524	13,293	46,810

Table A1.4 Traffic volume survey result at Location CO-3

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-3 Direction Code : A Surveyor Name : Taufik Hidayat & Rusdi
 Date : July 22, 2010 Direction from : Cilincing Weather : Clear
 Day : Thursday Direction to : Tanjung Priok

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	3,239	1,026	187	49	10	39	55	17	36	112	81	1,612	4,851
07:00 - 08:00	4,136	1,137	230	52	8	58	62	13	47	115	73	1,795	5,931
08:00 - 09:00	2,100	912	175	31	2	81	80	20	30	139	92	1,562	3,662
09:00 - 10:00	2,275	826	144	29	1	103	93	25	41	226	166	1,654	3,929
10:00 - 11:00	1,157	630	131	27	6	85	75	39	43	145	139	1,320	2,477
11:00 - 12:00	996	413	109	30	10	113	91	26	64	184	179	1,219	2,215
12:00 - 13:00	1,053	343	122	32	8	89	48	11	37	161	87	938	1,991
13:00 - 14:00	1,063	378	113	28	5	79	45	13	31	149	109	950	2,013
14:00 - 15:00	1,263	200	145	11	5	50	130	83	108	165	107	1,004	2,267
15:00 - 16:00	1,157	220	110	5	0	64	91	35	81	136	75	817	1,974
16:00 - 17:00	1,549	276	150	2	4	47	96	23	77	160	68	903	2,452
17:00 - 18:00	1,760	358	65	23	8	65	67	16	43	237	120	1,002	2,762
18:00 - 19:00	1,206	155	116	10	1	30	40	7	35	104	78	576	1,782
19:00 - 20:00	1,658	237	180	35	5	24	46	4	43	157	110	841	2,499
20:00 - 21:00	914	107	88	12	0	15	20	3	24	202	148	619	1,533
21:00 - 22:00	837	100	89	4	1	22	28	7	29	204	180	664	1,501
22:00 - 23:00	543	218	34	7	0	51	19	6	90	351	316	1,092	1,635
23:00 - 24:00	637	89	21	0	0	15	12	2	38	197	177	551	1,188
24:00 - 01:00	431	139	12	3	1	14	20	5	28	116	102	440	871
01:00 - 02:00	275	121	8	0	0	16	17	9	34	95	117	417	692
02:00 - 03:00	121	29	6	1	1	7	13	6	30	69	94	256	377
03:00 - 04:00	197	61	9	11	1	14	9	4	41	112	85	347	544
04:00 - 05:00	229	76	38	26	1	16	21	3	21	92	77	371	600
05:00 - 06:00	325	157	106	31	2	13	39	7	38	83	85	561	886
Total Number of Vehicle													
24 hrs	29,121	8,208	2,388	459	80	1,110	1,217	384	1,089	3,711	2,865	21,511	50,632

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-3 Direction Code : B Surveyor Name : Didit G. & Bagus J.P.
 Date : July 22, 2010 Direction from : Tanjung Priok Weather : Clear
 Day : Thursday Direction to : Cilincing

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00	1,208	235	157	38	5	38	81	12	35	4	138	743	1,951
07:00 - 08:00	2,015	398	216	40	10	32	46	7	26	8	109	892	2,907
08:00 - 09:00	1,666	276	196	31	5	69	46	20	18	10	122	793	2,459
09:00 - 10:00	1,328	39	147	26	4	97	73	27	33	7	175	628	1,956
10:00 - 11:00	132	360	130	27	6	89	75	28	49	8	226	998	1,130
11:00 - 12:00	1,643	303	113	18	2	104	73	8	55	2	257	935	2,578
12:00 - 13:00	1,529	336	136	27	3	117	67	20	56	4	210	976	2,505
13:00 - 14:00	1,842	315	119	25	1	99	62	16	29	4	250	920	2,762
14:00 - 15:00	1,527	313	134	26	3	77	85	57	71	179	143	1,088	2,615
15:00 - 16:00	2,150	294	100	12	5	49	104	72	36	175	155	1,002	3,152
16:00 - 17:00	2,145	315	130	15	6	55	72	60	40	189	101	983	3,128
17:00 - 18:00	3,300	582	200	21	25	48	120	90	26	239	84	1,435	4,735
18:00 - 19:00	4,237	305	378	33	41	51	242	59	48	154	107	1,418	5,655
19:00 - 20:00	1,246	161	109	19	4	17	12	34	21	144	116	637	1,883
20:00 - 21:00	986	162	125	25	1	16	36	16	62	178	149	770	1,756
21:00 - 22:00	930	64	84	5	1	12	11	15	11	151	161	515	1,445
22:00 - 23:00	793	82	65	12	0	18	33	3	30	92	228	563	1,356
23:00 - 24:00	663	56	34	3	0	8	21	3	19	46	132	322	985
24:00 - 01:00	387	66	15	2	0	17	30	4	57	75	195	461	848
01:00 - 02:00	318	57	8	1	0	28	17	3	32	75	129	350	668
02:00 - 03:00	295	38	13	3	0	13	17	4	31	76	130	325	620
03:00 - 04:00	233	53	14	9	1	12	22	2	34	39	159	345	578
04:00 - 05:00	218	58	23	21	0	11	33	9	41	11	126	333	551
05:00 - 06:00	351	63	67	15	2	8	29	8	30	17	133	372	723
Total Number of Vehicle													
24 hrs	31,142	4,931	2,713	454	125	1,085	1,407	577	890	1,887	3,735	17,804	48,946

Final Report

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

November 2010

Table A1.5 Traffic volume survey result at Location CO-4

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-4 Direction Code : A Surveyor Name
Date : July 22, 2010 Direction from : Cilincing Weather : Clear
Day : Thursday Direction to : Tanjung Priok

Hour Begins	1 Motorcycle	2 Sedan, Jeep, Wagon,	3 Mikrolet Angkot	4 Medium Bus	5 Large Bus	6 Pick Up	7 Truck 3/4 ton 2 Axle	8 Large Truck 2 Axle	9 Truck 3 Axle	10 Truck 4 Axle	11 Truck 5 Axle or more,	TOTAL	
												Without Motorcycle	With Motorcycle
06:00 - 07:00	3,944	1,016	242	47	9	16	23	59	46	95	69	1,622	5,566
07:00 - 08:00	6,034	1,494	264	42	7	23	25	69	26	104	66	2,120	8,154
08:00 - 09:00	4,457	889	257	33	2	49	48	139	40	157	104	1,718	6,175
09:00 - 10:00	2,081	554	221	33	1	56	50	147	24	265	194	1,545	3,626
10:00 - 11:00	1,541	461	182	25	6	65	57	174	49	222	213	1,454	2,995
11:00 - 12:00	1,176	324	156	20	7	57	46	146	35	188	182	1,161	2,337
12:00 - 13:00	1,475	403	215	25	6	86	47	172	74	236	128	1,392	2,867
13:00 - 14:00	1,413	335	166	25	5	75	42	104	42	150	109	1,053	2,466
14:00 - 15:00	1,127	275	111	17	8	18	47	91	25	184	120	896	2,023
15:00 - 16:00	1,207	197	134	22	6	20	29	119	25	228	126	906	2,113
16:00 - 17:00	1,443	332	158	19	18	27	55	91	55	273	116	1,144	2,587
17:00 - 18:00	1,120	310	150	26	9	25	25	46	32	245	124	992	2,112
18:00 - 19:00	1,360	212	199	24	2	16	22	14	31	145	108	773	2,133
19:00 - 20:00	1,372	279	178	18	3	13	26	44	49	212	149	971	2,343
20:00 - 21:00	1,017	122	130	12	0	15	21	40	28	186	137	691	1,708
21:00 - 22:00	959	148	102	7	2	8	11	23	18	191	169	679	1,638
22:00 - 23:00	749	178	81	3	0	6	10	15	29	164	148	634	1,383
23:00 - 24:00	402	114	47	2	0	8	7	17	18	90	81	384	786
24:00 - 01:00	215	32	18	1	0	5	8	9	31	114	100	318	533
01:00 - 02:00	268	79	17	2	0	9	10	13	21	103	127	381	649
02:00 - 03:00	251	67	4	3	4	9	11	11	27	102	139	377	628
03:00 - 04:00	249	55	20	11	1	9	6	16	27	117	19	281	530
04:00 - 05:00	248	78	43	18	1	8	11	32	21	106	88	406	654
05:00 - 06:00	766	175	147	25	2	5	16	39	20	126	129	684	1,450
Total Number of Vehicle													
24 hrs	34,874	8,129	3,242	460	99	628	653	1,630	793	4,003	2,945	22,582	57,456

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-4 Direction Code : B Surveyor Name
Date : July 22, 2010 Direction from : Tanjung Priok Weather : Clear
Day : Thursday Direction to : Cilincing

Hour Begins	1 Motorcycle	2 Sedan, Jeep, Wagon,	3 Mikrolet Angkot	4 Medium Bus	5 Large Bus	6 Pick Up	7 Truck 3/4 ton 2 Axle	8 Large Truck 2 Axle	9 Truck 3 Axle	10 Truck 4 Axle	11 Truck 5 Axle or more,	TOTAL	
												Without Motor Cycle	With Motor Cycle
06:00 - 07:00	1,258	231	182	45	6	6	14	79	27	8	270	868	2,126
07:00 - 08:00	2,326	435	290	40	10	9	13	63	27	15	203	1,105	3,431
08:00 - 09:00	1,814	371	244	34	5	27	18	95	29	16	197	1,036	2,850
09:00 - 10:00	1,744	397	249	27	4	55	42	124	54	10	248	1,210	2,954
10:00 - 11:00	1,701	346	189	21	5	58	49	112	41	41	304	1,166	2,867
11:00 - 12:00	1,772	334	189	19	2	68	48	137	39	75	392	1,303	3,075
12:00 - 13:00	1,319	304	163	27	3	57	32	90	44	95	278	1,093	2,412
13:00 - 14:00	1,558	349	216	28	1	48	30	82	37	125	359	1,275	2,833
14:00 - 15:00	1,315	384	150	22	3	64	70	129	65	195	155	1,237	2,552
15:00 - 16:00	1,543	367	138	14	6	29	63	128	44	173	154	1,116	2,659
16:00 - 17:00	2,074	409	165	18	7	46	61	67	45	269	143	1,230	3,304
17:00 - 18:00	2,995	415	173	33	40	26	64	39	33	266	94	1,183	4,178
18:00 - 19:00	1,976	411	141	16	19	11	51	45	31	152	105	982	2,958
19:00 - 20:00	1,893	253	125	17	3	32	23	34	30	162	131	810	2,703
20:00 - 21:00	1,421	255	173	17	1	10	23	32	41	219	183	954	2,375
21:00 - 22:00	1,823	179	93	9	2	10	10	42	13	139	148	645	2,468
22:00 - 23:00	1,592	201	89	0	0	8	14	36	23	96	238	705	2,297
23:00 - 24:00	1,572	148	90	1	0	4	18	35	24	58	166	544	2,116
24:00 - 01:00	801	86	55	2	0	6	10	24	29	98	254	564	1,365
01:00 - 02:00	351	29	21	1	0	4	8	19	27	92	157	358	709
02:00 - 03:00	359	32	6	3	0	5	7	16	8	84	145	306	665
03:00 - 04:00	296	61	13	14	2	8	14	32	21	51	210	426	722
04:00 - 05:00	236	46	38	21	0	3	9	40	14	18	207	396	632
05:00 - 06:00	315	91	97	23	3	3	10	55	20	23	179	504	819
Total Number of Vehicle													
24 hrs	34,054	6,134	3,289	452	122	597	701	1,555	766	2,480	4,920	21,016	55,070

Final Report

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

November 2010

Table A1.6 Traffic volume survey result at Location CO-5

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-5 Arteri Direction Code : A Surveyor Name : Rustam & Mansursyah
Date : July 22, 2010 Direction from : Cakung Weather : Clear
Day : Thursday Direction to : Tanjung Priok

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	10,604	862	55	8	7	8	4	17	6	12	38	1,017	11,621
07:00 - 08:00	6,365	437	69	8	5	14	24	29	4	41	51	682	7,047
08:00 - 09:00	2,338	236	53	3		30	38	28	17	80	103	588	2,926
09:00 - 10:00	1,127	109	34			18	55	31	10	92	71	420	1,547
10:00 - 11:00	990	136	34			45	48	21	28	109	122	543	1,533
11:00 - 12:00	526	108	18			31	36	11	20	71	86	381	907
12:00 - 13:00	659	107	36	3		33	46	12	14	65	50	366	1,025
13:00 - 14:00	767	192	41			37	44	25	12	100	76	527	1,294
14:00 - 15:00	1,001	405	44	59		78	40	4	50	28	286	994	1,995
15:00 - 16:00	1,078	334	49	14	1	56	25	19	45	67	234	844	1,922
16:00 - 17:00	1,348	412	50	1		49	27	5	33	86	156	819	2,167
17:00 - 18:00	2,325	306	35	7		21	12	7	17	88	114	607	2,932
18:00 - 19:00	1,487	253	53	3	2	26	7	2	19	36	88	489	1,976
19:00 - 20:00	1,012	128	32	1	1	22	3	5	11	59	57	319	1,331
20:00 - 21:00	706	108	40			24	9		7	75	69	332	1,038
21:00 - 22:00	703	126	29		1	12	10	7	19	62	81	347	1,050
22:00 - 23:00	584	99	30	4	3	13	11	4	11	47	43	265	849
23:00 - 24:00	559	43	10	2		6	9	5	13	31	44	163	722
24:00 - 01:00	93	26	8			8	4	2	10	23	45	126	219
01:00 - 02:00	81	14	6	4		6	1	1	8	22	42	104	185
02:00 - 03:00	27	10	5			6	1	1	9	27	41	100	127
03:00 - 04:00	65	35	6	1	1	7	11	2	13	15	53	144	209
04:00 - 05:00	182	43	13	6	4	16	12	8	15	22	49	188	370
05:00 - 06:00	961	89	29	1	3	9	17	13	24	24	32	241	1,202
Total Number of Vehicle													
24 hrs	35,588	4,618	779	125	28	575	494	259	415	1,282	2,031	10,606	46,194

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-5 Arteri Direction Code : B Surveyor Name : Sofinuddin
Date : July 22, 2010 Direction from : Tanjung Priok Weather : Clear
Day : Thursday Direction to : Cakung

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00	5,820	782	56	4	3	14	12	15	8	44	51	989	6,809
07:00 - 08:00	5,338	342	61	3	2	15	16	18	15	77	57	606	5,944
08:00 - 09:00	1,184	292	56		1	30	17	20	13	103	110	642	1,826
09:00 - 10:00	726	194	43			41	41	22	31	98	139	609	1,335
10:00 - 11:00	629	120	42			58	39	15	34	88	128	524	1,153
11:00 - 12:00	621	117	38			51	44	11	30	92	141	524	1,145
12:00 - 13:00	660	154	42			61	40	6	20	79	96	498	1,158
13:00 - 14:00	786	162	46			67	69	29	23	73	118	587	1,373
14:00 - 15:00	767	162	38		1	54	36	19	24	46	149	529	1,296
15:00 - 16:00	1,321	210	47	1		48	58	14	31	85	129	623	1,944
16:00 - 17:00	1,752	328	51	3	3	36	73	14	28	96	87	719	2,471
17:00 - 18:00	2,995	405	48	3	11	38	42	15	27	73	89	751	3,746
18:00 - 19:00	4,115	471	76	4	5	28	16	8	31	61	147	847	4,962
19:00 - 20:00	1,684	280	44	2		30	23	12	15	59	47	512	2,196
20:00 - 21:00	1,969	239	40	1		15	24	9	10	25	89	452	2,421
21:00 - 22:00	1,221	178	36		3	13	10	7	14	24	98	383	1,604
22:00 - 23:00	696	116	25	1	2	4	8	4	23	54	63	300	996
23:00 - 24:00	634	87	21	1	2	8	7	4	8	39	34	211	845
24:00 - 01:00	346	46	14	1		4	6	3	17	43	54	188	534
01:00 - 02:00	112	12	10			6	2	4	13	33	42	122	234
02:00 - 03:00	69	10	9			6	5		4	28	51	113	182
03:00 - 04:00	80	23	7		1	15	1	5	9	42	53	156	236
04:00 - 05:00	93	22	19	1		8	7	6	12	34	47	156	249
05:00 - 06:00	631	85	34	1		6	9	20	22	58	59	294	925
Total Number of Vehicle													
24 hrs	34,249	4,837	903	26	34	656	605	280	462	1,454	2,078	11,335	45,584

Table A1.7 Traffic volume survey result at Location CO-5

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-5 Tol Direction Code : B Surveyor Name : M. Sholeh
 Date : July 22, 2010 Direction from : Tanjung Priok Weather : Clear
 Day : Thursday Direction to : Cakung

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00		75			2	3	8	7	21	86	72	274	274
07:00 - 08:00		76		6	1	7	16	8	14	72	62	262	262
08:00 - 09:00		81		4		15	21	6	24	85	63	299	299
09:00 - 10:00		88	1			9	55	12	29	79	75	348	348
10:00 - 11:00		75				28	47	27	36	98	75	386	386
11:00 - 12:00		110				22	49	17	63	115	89	465	465
12:00 - 13:00		124			1	32	61	13	46	66	71	414	414
13:00 - 14:00		131			1	35	48	8	36	57	47	363	363
14:00 - 15:00		120				47	62	13	44	45	53	384	384
15:00 - 16:00		172		2	2	50	66	23	60	77	72	524	524
16:00 - 17:00		342	1	10	2	60	62	36	42	61	71	687	687
17:00 - 18:00		584		6	2	46	50	21	63	67	75	914	914
18:00 - 19:00		510		3	2	33	46	14	59	36	47	750	750
19:00 - 20:00		253	1	2	5	2	34	15	43	25	50	430	430
20:00 - 21:00		142	1		3	21	11	11	44	22	57	312	312
21:00 - 22:00		77			2	14	8	13	32	34	61	241	241
22:00 - 23:00		51			1	4	18	8	35	44	60	221	221
23:00 - 24:00		27				5	12	6	28	31	38	147	147
24:00 - 01:00		21		5		3	6	3	24	34	70	166	166
01:00 - 02:00		21				4	6	3	25	37	66	162	162
02:00 - 03:00		8				1	5	4	29	59	69	175	175
03:00 - 04:00		5		1	1		4	3	17	53	45	129	129
04:00 - 05:00		17				5	5	7	32	75	67	208	208
05:00 - 06:00		22				3	7	11	27	78	69	217	217
Total Number of Vehicle													
24 hrs	0	3,132	4	39	25	449	707	289	873	1,436	1,524	8,478	8,478

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-5 Tol Direction Code : A Surveyor Name : Burhanuddin & Amsin
 Date : July 22, 2010 Direction from : Cakung Weather : Clear
 Day : Thursday Direction to : Tanjung Priok

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00		1,010		15	13	26	19	32	29	28	25	1,197	1,197
07:00 - 08:00		1,340		6	1	38	24	34	21	24	24	1,512	1,512
08:00 - 09:00		753			2	74	36	8	32	35	40	980	980
09:00 - 10:00		219			2	34	33	12	15	10	77	402	402
10:00 - 11:00		18			3	28	47	15	16	28	24	179	179
11:00 - 12:00		122		1		31	35	16	22	88	69	384	384
12:00 - 13:00		106				25	34	13	18	46	73	315	315
13:00 - 14:00		116				27	16	7	16	52	34	268	268
14:00 - 15:00		165		5		54	48	14	41	68	35	430	430
15:00 - 16:00		145				46	42	8	37	55	40	373	373
16:00 - 17:00		139				39	32	9	37	59	58	373	373
17:00 - 18:00		75		1		17	47	14	35	85	68	342	342
18:00 - 19:00		100				24	27	6	45	103	75	380	380
19:00 - 20:00		51				28	13	4	26	62	91	275	275
20:00 - 21:00		56				15	24	7	34	75	83	294	294
21:00 - 22:00		58				17	30	4	49	102	100	360	360
22:00 - 23:00		22		1	1	6	17	5	19	50	92	213	213
23:00 - 24:00		17				3	10	1	28	44	46	149	149
24:00 - 01:00		27				9	7	1	21	29	64	158	158
01:00 - 02:00		2				7	2	1	25	24	39	100	100
02:00 - 03:00		5				1	4	2	13	15	40	80	80
03:00 - 04:00		5					9	2	8	14	25	63	63
04:00 - 05:00		6			1	3	8	6	27	20	31	102	102
05:00 - 06:00		176		3		8	10	19	12	36	42	306	306
Total Number of Vehicle													
24 hrs	0	4,733	0	32	23	560	574	240	626	1,152	1,295	9,235	9,235

Final Report

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

November 2010

Table A1.8 Traffic volume survey result at Location CO-5

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-5 Total
Date : July 22, 2010
Day : Thursday

Direction Code : B
Direction from : Tanjung Priok
Direction to : Cakung

Surveyor Name : M. Sholeh
Weather : Clear

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	10,604	937	55	8	9	11	12	24	27	98	110	1,291	11,895
07:00 - 08:00	6,365	513	69	14	6	21	40	37	18	113	113	944	7,309
08:00 - 09:00	2,338	317	53	7	0	45	59	34	41	165	166	887	3,225
09:00 - 10:00	1,127	197	35	0	0	27	110	43	39	171	146	768	1,895
10:00 - 11:00	990	211	34	0	0	73	95	48	64	207	197	929	1,919
11:00 - 12:00	526	218	18	0	0	53	85	28	83	186	175	846	1,372
12:00 - 13:00	659	231	36	3	1	65	107	25	60	131	121	780	1,439
13:00 - 14:00	767	323	41	0	1	72	92	33	48	157	123	890	1,657
14:00 - 15:00	1,001	525	44	59	0	125	102	17	94	73	339	1,378	2,379
15:00 - 16:00	1,078	506	49	16	3	106	91	42	105	144	306	1,368	2,446
16:00 - 17:00	1,348	754	51	11	2	109	89	41	75	147	227	1,506	2,854
17:00 - 18:00	2,325	890	35	13	2	67	62	28	80	155	189	1,521	3,846
18:00 - 19:00	1,487	763	53	6	4	59	53	16	78	72	135	1,239	2,726
19:00 - 20:00	1,012	381	33	3	6	24	37	20	54	84	107	749	1,761
20:00 - 21:00	706	250	41	0	3	45	20	11	51	97	126	644	1,350
21:00 - 22:00	703	203	29	0	3	26	18	20	51	96	142	588	1,291
22:00 - 23:00	584	150	30	4	4	17	29	12	46	91	103	486	1,070
23:00 - 24:00	559	70	10	2	0	11	21	11	41	62	82	310	869
24:00 - 01:00	93	47	8	5	0	11	10	5	34	57	115	292	385
01:00 - 02:00	81	35	6	4	0	10	7	4	33	59	108	266	347
02:00 - 03:00	27	18	5	0	0	7	6	5	38	86	110	275	302
03:00 - 04:00	65	40	6	2	2	7	15	5	30	68	98	273	338
04:00 - 05:00	182	60	13	6	4	21	17	15	47	97	116	396	578
05:00 - 06:00	961	111	29	1	3	12	24	24	51	102	101	458	1,419
Total Number of Vehicle													
24 hrs	35,588	7,750	783	164	53	1,024	1,201	548	1,288	2,718	3,555	19,084	54,672

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-5 Total
Date : July 22, 2010
Day : Thursday

Direction Code : A
Direction from : Cakung
Direction to : Tanjung Priok

Surveyor Name : Burhanuddin & Amsin
Weather : Clear

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00	5,820	1,792	56	19	16	40	31	47	37	72	76	2,186	8,006
07:00 - 08:00	5,338	1,682	61	9	3	53	40	52	36	101	81	2,118	7,456
08:00 - 09:00	1,184	1,045	56	0	3	104	53	28	45	138	150	1,622	2,806
09:00 - 10:00	726	413	43	0	2	75	74	34	46	108	216	1,011	1,737
10:00 - 11:00	629	138	42	0	3	86	86	30	50	116	152	703	1,332
11:00 - 12:00	621	239	38	1	0	82	79	27	52	180	210	908	1,529
12:00 - 13:00	660	260	42	0	0	86	74	19	38	125	169	813	1,473
13:00 - 14:00	786	278	46	0	0	94	85	36	39	125	152	855	1,641
14:00 - 15:00	767	327	38	5	1	108	84	33	65	114	184	959	1,726
15:00 - 16:00	1,321	355	47	1	0	94	100	22	68	140	169	996	2,317
16:00 - 17:00	1,752	467	51	3	3	75	105	23	65	155	145	1,092	2,844
17:00 - 18:00	2,995	480	48	4	11	55	89	29	62	158	157	1,093	4,088
18:00 - 19:00	4,115	571	76	4	5	52	43	14	76	164	222	1,227	5,342
19:00 - 20:00	1,684	331	44	2	0	58	36	16	41	121	138	787	2,471
20:00 - 21:00	1,969	295	40	1	0	30	48	16	44	100	172	746	2,715
21:00 - 22:00	1,221	236	36	0	3	30	40	11	63	126	198	743	1,964
22:00 - 23:00	696	138	25	2	3	10	25	9	42	104	155	513	1,209
23:00 - 24:00	634	104	21	1	2	11	17	5	36	83	80	360	994
24:00 - 01:00	346	73	14	1	0	13	13	4	38	72	118	346	692
01:00 - 02:00	112	14	10	0	0	13	4	5	38	57	81	222	334
02:00 - 03:00	69	15	9	0	0	7	9	2	17	43	91	193	262
03:00 - 04:00	80	28	7	0	1	15	10	7	17	56	78	219	299
04:00 - 05:00	93	28	19	1	1	11	15	12	39	54	78	258	351
05:00 - 06:00	631	261	34	4	0	14	19	39	34	94	101	600	1,231
Total Number of Vehicle													
24 hrs	34,249	9,570	903	58	57	1,216	1,179	520	1,088	2,606	3,373	20,570	54,819

Final Report

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

November 2010

Table A1.9 Traffic volume survey result at Location CO-6

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-6 Arteri Direction Code : A Surveyor Name : Heru P. & Ade Hermawar
Date : July 22, 2010 Direction from : Cawang Weather : Clear
Day : Thursday Direction to : Tanjung Priok

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	1,777	724	208	52	55	36	111	10	36	25	67	1,324	3,101
07:00 - 08:00	2,903	996	264	57	53	50	78	14	25	31	36	1,604	4,507
08:00 - 09:00	2,586	1,127	253	60	54	95	132	59	36	51	56	1,923	4,509
09:00 - 10:00	2,291	1,157	226	36	37	131	96	39	48	74	72	1,916	4,207
10:00 - 11:00	1,836	1,275	210	39	38	158	200	47	44	93	78	2,182	4,018
11:00 - 12:00	1,616	1,120	217	34	32	192	130	42	49	170	115	2,101	3,717
12:00 - 13:00	1,441	1,046	189	49	36	177	73	26	46	174	111	1,927	3,368
13:00 - 14:00	1,802	1,112	208	38	30	174	174	54	50	188	94	2,122	3,924
14:00 - 15:00	1,078	969	166	38	32	218	57	15	52	163	93	1,803	2,881
15:00 - 16:00	1,174	1,040	148	37	28	191	60	28	45	175	116	1,868	3,042
16:00 - 17:00	2,085	861	147	42	11	134	59	9	27	123	71	1,484	3,569
17:00 - 18:00	2,983	1,167	139	39	5	95	39	7	33	130	72	1,726	4,709
18:00 - 19:00	4,831	1,011	151	62	18	144	31	9	25	163	77	1,691	6,522
19:00 - 20:00	2,071	881	156	54	27	101	37	13	37	118	85	1,509	3,580
20:00 - 21:00	1,261	620	69	35	16	45	12	7	42	106	95	1,047	2,308
21:00 - 22:00	1,535	630	30	24	12	55	5	2	26	37	58	879	2,414
22:00 - 23:00	945	561	38	6	12	43	16	4	41	82	71	874	1,819
23:00 - 24:00	626	341	8	4	4	39	31	5	32	72	64	600	1,226
24:00 - 01:00	335	232	1		4	23	33	8	32	49	75	457	792
01:00 - 02:00	211	128	0	1	2	45	24	5	36	48	38	327	538
02:00 - 03:00	166	83	2	4		28	21		21	27	43	229	395
03:00 - 04:00	152	107	1	11	3	20	22		24	46	32	266	418
04:00 - 05:00	182	115	7	15	13	21	21	6	40	52	44	334	516
05:00 - 06:00	515	212	65	35	28	19	48	22	34	37	45	545	1,060
Total Number of Vehicle													
24 hrs	36,402	17,515	2,903	772	550	2,234	1,510	431	881	2,234	1,708	30,738	67,140

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-6 Arteri Direction Code : B Surveyor Name : Imron & Saipul M.
Date : July 22, 2010 Direction from : Tanjung Priok Weather : Clear
Day : Thursday Direction to : Cawang

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00	1,999	958	193	54	66	29	56	12	33	13	79	1,493	3,492
07:00 - 08:00	2,537	1,107	212	46	56	36	64	4	31	22	65	1,643	4,180
08:00 - 09:00	2,052	805	207	67	58	63	102	35	43	28	120	1,528	3,580
09:00 - 10:00	1,644	754	214	46	44	90	149	41	40	46	145	1,569	3,213
10:00 - 11:00	1,781	833	194	43	45	95	184	46	42	38	169	1,689	3,470
11:00 - 12:00	1,555	952	190	45	50	125	193	56	38	20	164	1,833	3,388
12:00 - 13:00	1,593	698	185	35	48	76	168	26	40	11	122	1,409	3,002
13:00 - 14:00	1,544	868	159	36	34	92	64	11	34	18	128	1,444	2,988
14:00 - 15:00	1,504	863	183	40	44	58	117	20	64	144	52	1,585	3,089
15:00 - 16:00	1,483	775	139	76	36	195	118	27	58	90	90	1,604	3,087
16:00 - 17:00	1,530	588	87	57	35	134	62	10	30	56	81	1,140	2,670
17:00 - 18:00	1,594	502	44	38	33	87	62	12	19	60	84	941	2,535
18:00 - 19:00	1,530	906	105	92	39	87	46	11	44	15	76	1,421	2,951
19:00 - 20:00	978	840	134	97	31	72	32	11	47	10	65	1,339	2,317
20:00 - 21:00	980	555	120	58	32	38	66	13	39	61	46	1,028	2,008
21:00 - 22:00	856	488	103	42	23	34	16	7	35	48	75	871	1,727
22:00 - 23:00	679	408	43	9	22	33	20	15	30	41	106	727	1,406
23:00 - 24:00	516	292	10		8	37	25	7	40	23	73	515	1,031
24:00 - 01:00	351	218	4		1	25	21	10	26	61	83	449	800
01:00 - 02:00	200	135	1	4		22	10	4	15	30	46	267	467
02:00 - 03:00	153	93		4		17	9	5	16	18	80	242	395
03:00 - 04:00	163	84	1	9	1	16	9	6	20	10	73	229	392
04:00 - 05:00	176	118	5	19	6	14	25	11	27	5	67	297	473
05:00 - 06:00	507	213	57	30	18	26	19	13	18	20	35	449	956
Total Number of Vehicle													
24 hrs	27,905	14,053	2,590	947	730	1,501	1,637	413	829	888	2,124	25,712	53,617

Table A1.10 Traffic volume survey result at Location CO-6

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-6 Tol Direction Code : A Surveyor Name : Suherman
 Date : July 22, 2010 Direction from : Cawang Weather : Clear
 Day : Thursday Direction to : Tanjung Priok

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00		222		10	24	6	31	16	30	11	9	359	359
07:00 - 08:00		405		5	28	7	22	14	15	7	10	513	513
08:00 - 09:00		360			29	16	38	22	18	14	12	509	509
09:00 - 10:00		318	2	2	33	24	72	22	51	17	12	553	553
10:00 - 11:00		354	2	4	32	30	76	20	51	28	15	612	612
11:00 - 12:00		282	1	3	34	44	61	19	50	38	17	549	549
12:00 - 13:00		270	1	1	30	34	69	44	62	44	23	578	578
13:00 - 14:00		267		3	19	30	45	27	77	41	15	524	524
14:00 - 15:00		290		1	34	47	59	57	45	48	16	597	597
15:00 - 16:00		203	2	10	37	30	51	35	64	19	35	486	486
16:00 - 17:00		287	1	7	36	26	46	37	43	17	32	532	532
17:00 - 18:00		469	10	18	54	32	54	29	62	41	24	793	793
18:00 - 19:00		377	6	11	49	29	24	38	49	16	32	631	631
19:00 - 20:00		249	1	9	22	23	25	19	47	48	17	460	460
20:00 - 21:00		1,489		8	16	32	17	17	55	55	30	1,719	1,719
21:00 - 22:00		70	2		10	10	11	12	46	10	39	210	210
22:00 - 23:00		82		2	3	8	10	4	50	12	32	203	203
23:00 - 24:00		43			3	6	7	2	50	25	16	152	152
24:00 - 01:00		25	1		1	7	2	1	31	12	23	103	103
01:00 - 02:00		17			1	5	4	2	32	16	13	90	90
02:00 - 03:00		9		5	2	8	6	2	25	15	11	83	83
03:00 - 04:00		9		2	10	6	3	8	36	12	18	104	104
04:00 - 05:00		16		4	14	4	10	10	50	17	17	142	142
05:00 - 06:00		53			14	3	23	18	41	14	12	178	178
Total Number of Vehicle													
24 hrs	0	6,166	29	105	535	467	766	475	1,080	577	480	10,680	10,680

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-6 Tol Direction Code : B Surveyor Name : Toni
 Date : July 22, 2010 Direction from : Tanjung Priok Weather : Clear
 Day : Thursday Direction to : Cawang

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00		271		2	15	8	10	15	33	33	11	398	398
07:00 - 08:00		340		5	26	10	18	11	15	16	7	448	448
08:00 - 09:00		313		1	24	16	37	34	24	15	15	479	479
09:00 - 10:00		321		3	28	35	74	43	31	38	24	597	597
10:00 - 11:00		376		2	22	30	77	46	38	51	32	674	674
11:00 - 12:00		351			23	32	90	40	41	45	37	659	659
12:00 - 13:00		445	2	2	21	37	65	35	42	25	26	700	700
13:00 - 14:00		422		2	17	43	57	43	40	24	18	666	666
14:00 - 15:00		394		4	3	45	55	55	59	33	32	680	680
15:00 - 16:00		440		7	58	48	73	73	39	23	19	780	780
16:00 - 17:00		663	1	4		34	1	1	52	25	18	799	799
17:00 - 18:00		743		22		29	4	4	53	30	15	900	900
18:00 - 19:00		387		6	2	20	5	5	31	7	18	481	481
19:00 - 20:00		290		7		17			27	8	16	365	365
20:00 - 21:00		205		2	1	10	13	13	22	14	12	292	292
21:00 - 22:00		155		4	6	12	8	8	30	8	13	244	244
22:00 - 23:00		113	2	1	20	3	44	44	33	13	23	296	296
23:00 - 24:00		60	1	5	18	4	38	38	30	9	5	208	208
24:00 - 01:00		30	2		34	7	21	21	43	20	17	195	195
01:00 - 02:00		27	2	1	43	3	17	17	21	11	14	156	156
02:00 - 03:00		19	1		18	4	16	16	32	19	10	135	135
03:00 - 04:00		19		1	30	2	18	18	31	15	9	143	143
04:00 - 05:00		15	1	1	16	5	29	29	28	13	11	148	148
05:00 - 06:00		68		2	10	4	19	19	25	8	10	165	165
Total Number of Vehicle													
24 hrs	0	6,467	12	84	435	458	789	628	820	503	412	10,608	10,608

Table A1.11 Traffic volume survey result at Location CO-6

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-6 Tol
Date : July 22, 2010
Day : Thursday

Direction Code : A
Direction from : Cawang
Direction to : Tanjung Priok

Surveyor Name : Suherman
Weather : Clear

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	1,777	946	208	62	79	42	142	26	66	36	76	1,683	3,460
07:00 - 08:00	2,903	1,401	264	62	81	57	100	28	40	38	46	2,117	5,020
08:00 - 09:00	2,586	1,487	253	60	83	111	170	81	54	65	68	2,432	5,018
09:00 - 10:00	2,291	1,475	228	38	70	155	168	61	99	91	84	2,469	4,760
10:00 - 11:00	1,836	1,629	212	43	70	188	276	67	95	121	93	2,794	4,630
11:00 - 12:00	1,616	1,402	218	37	66	236	191	61	99	208	132	2,650	4,266
12:00 - 13:00	1,441	1,316	190	50	66	211	142	70	108	218	134	2,505	3,946
13:00 - 14:00	1,802	1,379	208	41	49	204	219	81	127	229	109	2,646	4,448
14:00 - 15:00	1,078	1,259	166	39	66	265	116	72	97	211	109	2,400	3,478
15:00 - 16:00	1,174	1,243	150	47	65	221	111	63	109	194	151	2,354	3,528
16:00 - 17:00	2,085	1,148	148	49	47	160	105	46	70	140	103	2,016	4,101
17:00 - 18:00	2,983	1,636	149	57	59	127	93	36	95	171	96	2,519	5,502
18:00 - 19:00	4,831	1,388	157	73	67	173	55	47	74	179	109	2,322	7,153
19:00 - 20:00	2,071	1,130	157	63	49	124	62	32	84	166	102	1,969	4,040
20:00 - 21:00	1,261	2,109	69	43	32	77	29	24	97	161	125	2,766	4,027
21:00 - 22:00	1,535	700	32	24	22	65	16	14	72	47	97	1,089	2,624
22:00 - 23:00	945	643	38	8	15	51	26	8	91	94	103	1,077	2,022
23:00 - 24:00	626	384	8	4	7	45	38	7	82	97	80	752	1,378
24:00 - 01:00	335	257	2	0	5	30	35	9	63	61	98	560	895
01:00 - 02:00	211	145	0	1	3	50	28	7	68	64	51	417	628
02:00 - 03:00	166	92	2	9	2	36	27	2	46	42	54	312	478
03:00 - 04:00	152	116	1	13	13	26	25	8	60	58	50	370	522
04:00 - 05:00	182	131	7	19	27	25	31	16	90	69	61	476	658
05:00 - 06:00	515	265	65	35	42	22	71	40	75	51	57	723	1,238
Total Number of Vehicle													
24 hrs	36,402	23,681	2,932	877	1,085	2,701	2,276	906	1,961	2,811	2,188	41,418	77,820

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-6 Tol
Date : July 22, 2010
Day : Thursday

Direction Code : B
Direction from : Tanjung Priok
Direction to : Cawang

Surveyor Name : Toni
Weather : Clear

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00	1,999	1,229	193	56	81	37	66	27	66	46	90	1,891	3,890
07:00 - 08:00	2,537	1,447	212	51	82	46	82	15	46	38	72	2,091	4,628
08:00 - 09:00	2,052	1,118	207	68	82	79	139	69	67	43	135	2,007	4,059
09:00 - 10:00	1,644	1,075	214	49	72	125	223	84	71	84	169	2,166	3,810
10:00 - 11:00	1,781	1,209	194	45	67	125	261	92	80	89	201	2,363	4,144
11:00 - 12:00	1,555	1,303	190	45	73	157	283	96	79	65	201	2,492	4,047
12:00 - 13:00	1,593	1,143	187	37	69	113	233	61	82	36	148	2,109	3,702
13:00 - 14:00	1,544	1,290	159	38	51	135	121	54	74	42	146	2,110	3,654
14:00 - 15:00	1,504	1,257	183	44	47	103	172	75	123	177	84	2,265	3,769
15:00 - 16:00	1,483	1,215	139	83	94	243	191	100	97	113	109	2,384	3,867
16:00 - 17:00	1,530	1,251	88	61	35	168	63	11	82	81	99	1,939	3,469
17:00 - 18:00	1,594	1,245	44	60	33	116	66	16	72	90	99	1,841	3,435
18:00 - 19:00	1,530	1,293	105	98	41	107	51	16	75	22	94	1,902	3,432
19:00 - 20:00	978	1,130	134	104	31	89	32	11	74	18	81	1,704	2,682
20:00 - 21:00	980	760	120	60	33	48	79	26	61	75	58	1,320	2,300
21:00 - 22:00	856	643	103	46	29	46	24	15	65	56	88	1,115	1,971
22:00 - 23:00	679	521	45	10	42	36	64	59	63	54	129	1,023	1,702
23:00 - 24:00	516	352	11	5	26	41	63	45	70	32	78	723	1,239
24:00 - 01:00	351	248	6	0	35	32	42	31	69	81	100	644	995
01:00 - 02:00	200	162	3	5	43	25	27	21	36	41	60	423	623
02:00 - 03:00	153	112	1	4	18	21	25	21	48	37	90	377	530
03:00 - 04:00	163	103	1	10	31	18	27	24	51	25	82	372	535
04:00 - 05:00	176	133	6	20	22	19	54	40	55	18	78	445	621
05:00 - 06:00	507	281	57	32	28	30	38	32	43	28	45	614	1,121
Total Number of Vehicle													
24 hrs	27,905	20,520	2,602	1,031	1,165	1,959	2,426	1,041	1,649	1,391	2,536	36,320	64,225

Final Report

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

November 2010

Table A1.12 Traffic volume survey result at Location CO-7

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-7 Tol
Date : July 22, 2010
Day : Thursday

Direction Code : A
Direction from : Harbor Tol
Direction to : Arteri

Surveyor Name :
Weather : Clear

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motorcycle	With Motorcycle
06:00 - 07:00	0	169		3	6	11	63	7	15	7	7	288	288
07:00 - 08:00	0	384	1	1	9	20	40	9	16	8	8	496	496
08:00 - 09:00	2	365		2	12	36	74	13	15	17	17	551	553
09:00 - 10:00	0	402	2	1	16	46	108	30	30	34	34	703	703
10:00 - 11:00	0	361		1	8	78	116	17	34	62	62	739	739
11:00 - 12:00	0	338			13	72	111	16	36	115	115	816	816
12:00 - 13:00	0	318	1	4	7	77	96	20	27	150	150	850	850
13:00 - 14:00	0	358		1	7	64	107	21	30	115	115	818	818
14:00 - 15:00	0	332	0	1	12	64	91	23	27	102	42	694	694
15:00 - 16:00	0	310	0	1	9	59	67	53	22	131	56	708	708
16:00 - 17:00	0	225	0	1	7	38	42	46	21	96	37	513	513
17:00 - 18:00	0	185	0	4	3	27	31	32	17	88	71	458	458
18:00 - 19:00	0	235	2	1	10	19	10	36	23	92	40	468	468
19:00 - 20:00	0	256	3	0	12	16	14	30	16	98	53	498	498
20:00 - 21:00	0	205	0	1	5	24	20	23	22	69	57	426	426
21:00 - 22:00	0	175	1	3	1	24	17	26	16	49	37	349	349
22:00 - 23:00	0	152	0	0	1	22	25	4	15	46	38	303	303
23:00 - 24:00	0	134	2	0	1	17	20	5	24	65	37	305	305
24:00 - 01:00	0	52	0	0	0	10	15	7	13	41	33	171	171
01:00 - 02:00	0	34	0	0	0	10	15	1	10	35	29	134	134
02:00 - 03:00	0	16	1	0	0	7	8	1	5	13	24	75	75
03:00 - 04:00	0	18	0	0	0	0	7	1	8	23	19	76	76
04:00 - 05:00	0	39	0	0	0	5	12	4	23	18	26	127	127
05:00 - 06:00	0	38	0	0	2	6	27	12	10	20	29	144	144
Total Number of Vehicle													
24 hrs	2	5,101	13	25	141	752	1,136	437	475	1,494	1,136	10,710	10,712

Spesification for Supplementary Traffic Survey for Special Assitance for Project Implementation for Tanjung Priok Acces Road

Traffic Count Survey

Location Number : C0-7 Tol
Date : July 22, 2010
Day : Thursday

Direction Code : B
Direction from : Arteri
Direction to : Harbor Tol

Surveyor Name : Ardilles
Weather : Clear

Hour Begins	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	Motorcycle	Sedan, Jeep, Wagon,	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more,	Without Motor Cycle	With Motor Cycle
06:00 - 07:00		174		7	13	26	23	4	23	50	28	348	348
07:00 - 08:00		726		4	13	35	45	4	16	38	23	904	904
08:00 - 09:00		660	2	2	9	44	100	16	22	79	27	961	961
09:00 - 10:00		596			9	85	136	26	15	74	23	964	964
10:00 - 11:00		573		2	7	94	177	29	29	81	35	1,027	1,027
11:00 - 12:00		566		2	14	83	173	39	39	84	27	1,027	1,027
12:00 - 13:00		527			9	118	183	36	31	87	41	1,032	1,032
13:00 - 14:00		630	1	4	10	101	152	12	30	62	39	1,041	1,041
14:00 - 15:00		604	0	2	7	100	219	27	42	82	30	1,113	1,113
15:00 - 16:00		945	0	1	8	85	181	28	42	57	38	1,385	1,385
16:00 - 17:00		613	0	1	8	83	116	22	26	33	24	926	926
17:00 - 18:00		711	0	3	8	45	81	23	19	36	33	959	959
18:00 - 19:00		587	1	2	7	63	80	13	21	62	25	861	861
19:00 - 20:00		644	0	0	4	45	69	31	21	40	30	884	884
20:00 - 21:00		547	1	1	2	32	56	10	14	31	33	727	727
21:00 - 22:00		456	0	0	1	20	32	9	26	32	26	602	602
22:00 - 23:00		339	0	0	0	25	21	14	15	27	31	472	472
23:00 - 24:00		140	0	1	0	12	14	2	9	20	15	213	213
24:00 - 01:00		95	1	0	0	8	12	4	7	17	19	163	163
01:00 - 02:00		49	1	1	0	3	4	5	10	15	17	105	105
02:00 - 03:00		29	0	0	0	8	3	2	5	21	19	87	87
03:00 - 04:00		63	1	0	0	3	6	6	13	40	24	156	156
04:00 - 05:00		120	0	2	0	6	12	4	12	44	25	225	225
05:00 - 06:00		160	0	1	2	10	15	13	10	58	24	293	293
Total Number of Vehicle													
24 hrs	0	10,554	8	36	131	1,134	1,910	379	497	1,170	656	16,475	16,475

Table A1.13 24 hour sectional Traffic Volume by each direction, each mode

			1	2	3	4	5	6	7	8	9	10	11	TOTAL			Modal Composition			
			Motorcy cle	Sedan, Jeep, Wagon, Kijang	Mikrolet Angkot	Medium Bus	Large Bus	Pick Up	Truck 3/4 ton 2 Axle	Large Truck 2 Axle	Truck 3 Axle	Truck 4 Axle	Truck 5 Axle or more, Trailers	Without Motorcycl e(a)	With Motorcycl e(b)	All Freight	Sedan(2 +6)	Bus(3-5)	Trucks(7 -11)	Large Vehicle Ratio (5, 9- 11)/a
CO-1	W2	W-E	27,548	3,678	1,660	184	243	571	545	840	519	1,055	446	9,741	37,289	3,405	40.3%	21.4%	35.0%	23.2%
		E-W	25,984	5,049	1,828	247	286	792	371	858	559	1,348	825	12,163	38,147	3,961	43.9%	19.4%	32.6%	24.8%
		TOTAL	53,532	8,727	3,488	431	529	1,363	916	1,698	1,078	2,403	1,271	21,904	75,436	7,366	42.3%	20.3%	33.6%	24.1%
CO-2	W1	W-E	27,772	4,516	3,690	776	1,045	652	610	308	346	679	295	12,917	40,689	2,238	43.1%	42.7%	17.3%	18.3%
		E-W	33,517	5,079	3,349	807	918	702	387	237	469	821	524	13,293	46,810	2,438	45.1%	38.2%	18.3%	20.6%
		TOTAL	61,289	9,595	7,039	1,583	1,963	1,354	997	545	815	1,500	819	26,210	87,499	4,676	44.1%	40.4%	17.8%	19.4%
CO-3	E2-A	W-E	29,121	8,208	2,388	459	80	1,110	1,217	384	1,089	3,711	2,865	21,511	50,632	9,266	38.5%	13.6%	43.1%	36.0%
		E-W	31,142	4,931	2,713	454	125	1,085	1,407	577	890	1,887	3,735	17,804	48,946	8,496	28.4%	18.5%	47.7%	37.3%
		TOTAL	60,263	13,139	5,101	913	205	2,195	2,624	961	1,979	5,598	6,600	39,315	99,578	17,762	33.9%	15.8%	45.2%	36.6%
CO-4	E2	W-E	34,874	8,129	3,242	460	99	628	653	1,630	793	4,003	2,945	22,582	57,456	10,024	36.4%	16.8%	44.4%	34.7%
		E-W	34,054	6,134	3,289	452	122	597	701	1,555	766	2,480	4,920	21,016	55,070	10,422	29.8%	18.4%	49.6%	39.4%
		TOTAL	68,928	14,263	6,531	912	221	1,225	1,354	3,185	1,559	6,483	7,865	43,598	112,526	20,446	33.2%	17.6%	46.9%	37.0%
CO-5	E1	S-N	35,588	7,750	783	164	53	1,024	1,201	548	1,288	2,718	3,555	19,084	54,672	9,310	40.9%	5.2%	48.8%	39.9%
		N-S	34,249	9,570	903	58	57	1,216	1,179	520	1,088	2,606	3,373	20,570	54,819	8,766	46.8%	4.9%	42.6%	34.6%
		TOTAL	69,837	17,320	1,686	222	110	2,240	2,380	1,068	2,376	5,324	6,928	39,654	109,491	18,076	44.0%	5.1%	45.6%	37.2%
CO-6	NS	S-N	36,402	23,681	2,932	877	1,085	2,701	2,276	906	1,961	2,811	2,188	41,418	77,820	10,142	59.8%	11.8%	24.5%	19.4%
		N-S	27,905	20,520	2,602	1,031	1,165	1,959	2,426	1,041	1,649	1,391	2,536	36,320	64,225	9,043	59.7%	13.2%	24.9%	18.6%
		TOTAL	64,307	44,201	5,534	1,908	2,250	4,660	4,702	1,947	3,610	4,202	4,724	77,738	142,045	19,185	59.8%	12.5%	24.7%	19.0%
CO-7	Direct	Off ramp	0	5,101	13	25	141	752	1,136	437	475	1,494	1,136	10,710	10,712	4,678	48.9%	1.7%	43.7%	30.3%
		On ramp	0	10,554	8	36	131	1,134	1,910	379	497	1,170	656	16,475	16,475	4,612	64.9%	1.1%	28.0%	14.9%
		TOTAL	0	15,655	21	61	272	1,886	3,046	816	972	2,664	1,792	27,185	27,187	9,290	58.6%	1.3%	34.2%	21.0%

1.2 Car Users' Stated Preference Survey for Tanjung Priok Access Road usage

(1) Objectives

The purpose of this study is

- ✓ To understand the present trip situation for Tanjung Priok Port from each direction
- ✓ To understand toll road users' stated preference of TgPA

(2) Specification of Survey

This survey was carried out by hearing method. The surveyor interviewed i) trip information, ii) toll road usage and iii) TgPA stated preferences to the vehicle users about traffic information to evaluate and recognize the future toll road traffic flow in Tanjung Priok Access Road. Number of sampling should be 500, which is enough to study car users' stated preference from statistical scopes. Interviewed location is shown in Table A1.14 decided from the viewpoint of freight transport quantity and the trip characteristics.

Table A1.14 List of location place of car user interview

No	Location type	Location place
1	Port Parking	Pelindo POS-III Parking
2	Port Parking	Pelindo POS-9 Parking
3	Port Parking	JICT Parking
4	Port Parking	KOJA Terminal Parking
5	Warehouse 1	Pergudangan Induk Koperasi TNI
6	Gas station 1	SPBU 34-14308
7	Gas station 2	SPBU 34-14105
8	Warehouse 2	PT. Masaji Tatanan Container Depo

Interview was implemented on 5th and 6th of August.

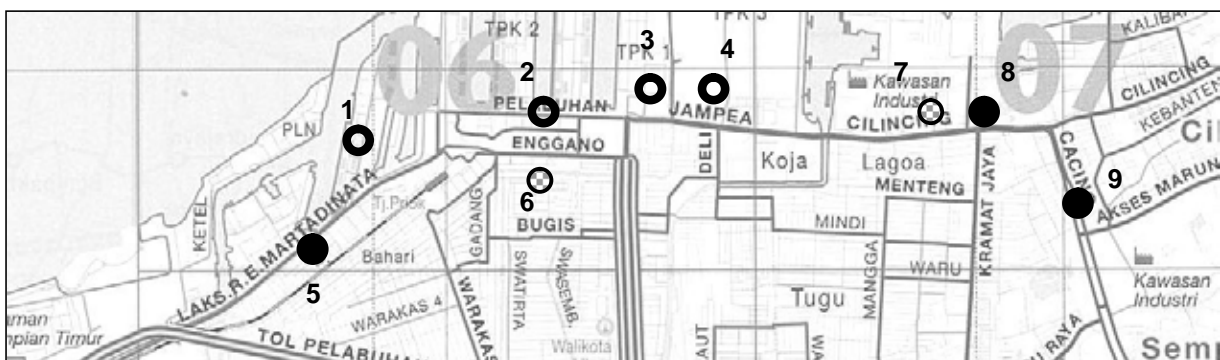


Figure A1.2 Stated Preference Survey Location

Survei Pendapat Pengguna Pelabuhan Tanjung Priok

Nama Lokasi :	<input type="text"/>	Jenis Kendaraan :	1. Truk 2 as 2. Truk 3 as atau lebih 3. Mobil Penumpang
Hari, Tanggal :	<input type="text"/>	Pekerjaan :	1. Pengemudi 2. Pekerja/Buruh Pelabuhan 3. Pelayan/pekerja 4. Lainnya (Tamu)
Pukul :	<input type="text"/>		

Kelompok 1 : Informasi Perjalanan

P1. Asal /Tujuan Perjalanan

Asal Perjalanan	Tujuan Perjalanan
Desa/Kel. <input type="text"/>	Desa/Kel. <input type="text"/>
Kecamatan <input type="text"/>	Kecamatan <input type="text"/>
Kab./Kot. (Propinsi) <input type="text"/>	Kab./Kot. (Propinsi) <input type="text"/>

P2. Maksud Perjalanan

1. Bekerja
2. Bisnis
3. Urusan Pribadi
4. Mengantar Barang
5. Mengambil Barang
6. Pulang ke rumah
7. Transportasi kosong
8. Lainnya ()

P3. Pengguna Jalan Tol

Apakah anda menggunakan jalan tol untuk perjalanan anda?

1. Ya 2 Tidak

P4. Jika P3. menjawab "Ya", Gerbang tol yang digunakan :

Masuk :

Keluar :

Kelompok 2 : Kesiediaan Pengguna Jalan Akses Tanjung Priok (TgPA)

Jika P1, menjawab :

- a. Dari/ke arah Barat (Tangerang, Cengkareng dll), lanjut pertanyaan P5 Barat;
- b. Dari/ke arah Selatan (Bogor, Sukabumi, dll), lanjut pertanyaan P5 Selatan;
- c. Dari/ke arah Timur (Bekasi, Bandung, dll). Lanjut pertanyaan P5 Timur.

Pada saat ini, Jalan Tol Akses Tanjung Priok sedang dalam tahap pembangunan. Ketika terbangun, anda dapat mengakses fasilitas gerbang pelabuhan melalui jalan tol. Setelah dioperasikan jalan tol akses pelabuhan, jika anda dari/ke arah Barat menuju ke pelabuhan. Alternatif rute mana yang akan anda pilih, dibawah ini.

P5. Dari/ke Barat.

Pilihan	Rute Kategori	Tarif dari Tomang Junction				
		I	II	III	IV	V
	1 : Kampung Bahari	6.500	8.000	10.500	13.000	15.500
	2 : Kebon Bwang	6.500	8.000	10.500	13.000	15.500
	3 : Koja Barat	13.500	16.500	20.500	25.000	30.000

P5. Dari/ke Selatan

Pilihan	Rute Kategori	Tarif dari TMII Junction				
		I	II	III	IV	V
	1 : Kampung Bahari	8.500	10.000	12.500	15.000	18.000
	2 : Kebon Bwang	8.500	10.000	12.500	15.000	18.000
	3 : Koja Barat	7.000	8.000	9.500	12.000	14.500

Pilihan	Rute Kategori	Tarif dari TMII Junction				
		I	II	III	IV	V
	1 : Kampung Bahari	8.500	10.000	12.500	15.000	18.000
	2 : Kebon Bwang	8.500	10.000	12.500	15.000	18.000
	3 : Koja Barat	11.000	13.000	16.000	20.000	24.000

Figure A1.3 (1) Survey sheet of Stated Preference Survey

P5. Dari/ke Timur

Pilihan	Rute Kategori	Tarif dari Cikunir Junction				
		I	II	III	IV	V
	1 : Kebon Bawang	8.000	11.000	14.000	17.500	20.500
	2 : Koja Timur	7.000	8.500	9.500	12.000	14.500
	3 : Rorotan	7.000	8.500	9.500	12.000	14.500

Pilihan	Rute Kategori	Tarif dari Cikunir Junction				
		I	II	III	IV	V
	1 : Kebon Bawang	8.000	11.000	14.000	17.500	20.500
	2 : Koja Timur	11.000	13.000	16.000	20.000	24.000
	3 : Rorotan	7.000	8.500	9.500	12.000	14.500

P6. Lalu Lintas Terusan

Ketika Akses Tanjung Priok dibuka secara penuh, diharapkan dapat berfungsi sebagai bypass ketika wilayah CBD mengalami kemacetan. Dari pengamatan anda, diharapkan dapat melewati wilayah kemacetan dengan lebih cepat, menghindari kemacetan tol dalam kota. Diharapkan pula dapat memberikan kontribusi dalam peningkatan kualitas lingkungan melalui penurunan tingkat kemacetan. Pergerakan dari arah Barat/Timur, Tol Dalam Kota macet dan melalui TgPA kemungkinan lebih lancar. Dalam kondisi dimaksud, mohon dijawab pertanyaan berikut ini.

- (1) Rute mana yang akan anda pilih antara 1) rute melalui jalan tol dalam kota (JIUT), dan 2) rute melalui TgPA dengan tarif toll sebagai berikut :

Pilihan	Rute Kategori	I	II	III	IV	V
	1 : JIUT	8.000	11.000	13.500	17.500	20.500
	2 : TgPA	13.500	16.500	20.000	25.000	30.000

- (2) Jika tarif tol akan diberlakukan, mana pilihan yang akan anda pilih

Pilihan	Rute Kategori	I	II	III	IV	V
	1 : JIUT	8.000	11.000	13.500	17.500	20.500
	2 : TgPA	17.500	21.000	26.500	33.000	39.500

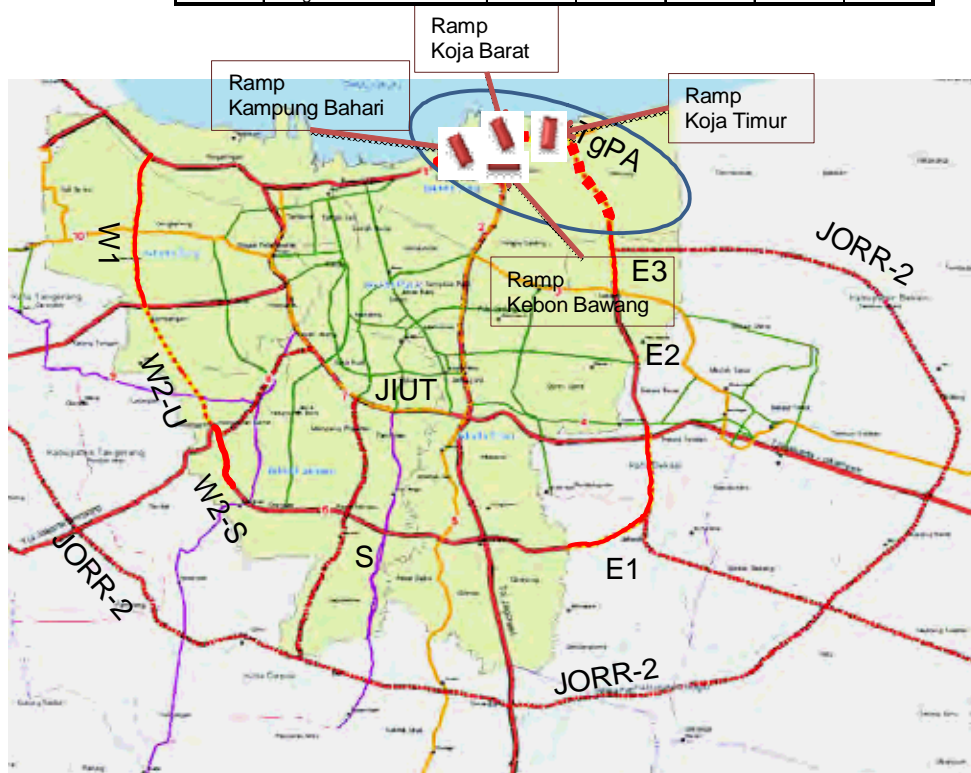


Figure A1.3 (2) Survey sheet of Stated Preference Survey

(3) Sample characteristics summary

Total number of samples for eight survey points is 899. Large trucks are 159, medium trucks are 468, and passenger car samples are 272. Number of sample by vehicle type by survey points is shown in Table A1.15.

Table A1.15 Number of sample by survey point, by types

Point L	ocation	Number of samples				Toll road Usage	
		Large Trucks	Medium Trucks	Passenger car	Total Y	es	No
1 port	POS-III Parking		29	29	4	69	25
2 port	POS-9 Parking	6		70	76	45	31
3 port JIC	T Parking	15	159	29	203	166	37
4 po rt	KOJA Terminal Parking	50	85		135	124	11
5 warehouse	Pergudangan In duk Koperasi TNI	38	29	168	3	45	38
6 gas station	SPBU 34-14308	27	52	65	144	84	59
7 gas station	SPBU 34-14105	23	81		104	104	0
8 warehouse	PT. Masa ji Tatanan Container Depo		60		60	51	9
Total		159	468	272	899	688	210

1.3 Travel Time Survey

(1) Objectives

The purpose of this survey is;

- ✓ To understand present travel time to/from Suburban area to/from Tanjung Priok port via toll road
- ✓ To compare with the present and forecasted travel time to evaluate the effect of TgPA Project

(2) Specification of Survey

The surveyors measured travel time from Tj. Priok port to the suburban city via toll road as shown in Table A1.16 and Figure A1.4 by morning peak and midday non peak time, by direction.

A pair of surveyor will get on a car as a driver and a recorder that will be check following items with GPS measuring.

Table A1.16 List of Travel time survey route

Route	Start Point/Finish Point (distance)	Main Route To/from Tanjung Priok Port
1	Cakung city (13km)	Cakung Industrial Area – Jl. Rorotan – Jl. Cakung Cilincing – Jl. Cilincing – Jl. Jampel
2	Cikarang city (43km)	Raya Cibiru – Cikarang IC- Jakarta Cikampek toll road – Cikunir JCT – JORR – Rorotan toll barrier - Jl. Cakung Cilincing – Jl. Cilincing – Jl. Jampel
3	Citeureup city (43km)	Cibinong IC – Jangrowi toll road – JIUT – Tanjung Priok Toll barrier – Jl. Sulawesi
4	Balaraja city (72km)	Balaraja Barat IC- Jakarta Merak Toll road – Tomang JCT – JIUT – Tanjung Priok 2 Ramp – Laks. Yos. Sudarso – Jl. Sulawesi

Travel time survey was implemented on 27, 28 and 29 of July, 2010.

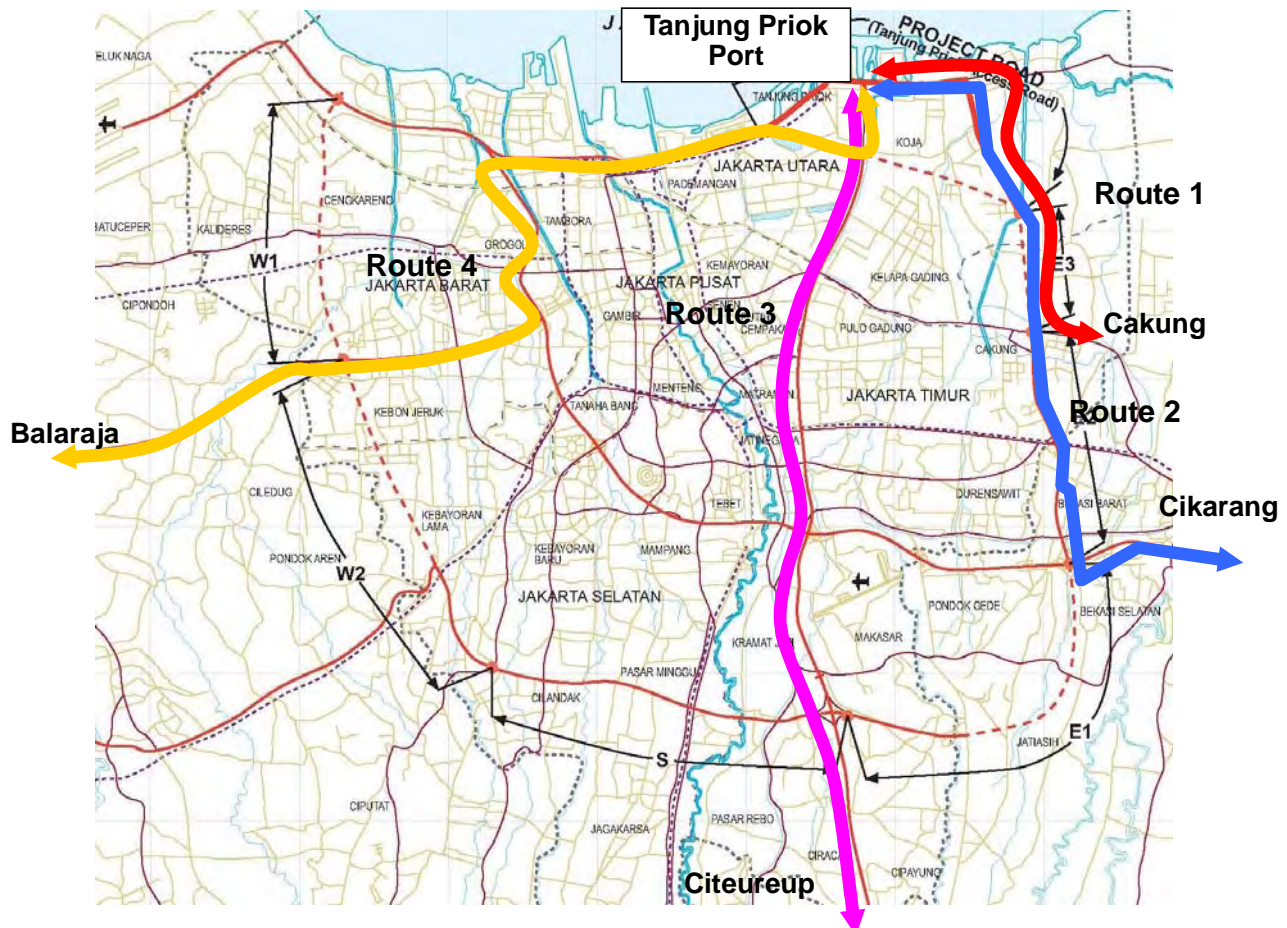


Figure A1.4 Travel time survey route

(3) Survey Result

Table A1.17 to Table A1.20 shows average travel time of each road section on the travel time survey route.

Table A1.17 (1) Average travel time and travel speed of route 1 (Morning peak inbound)

Route	1					
Time zone	Morning Peak					
Direction	Inbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perbatasan Jakarta Timur-Kota Bekasi (Tugu Garuda) (Arteri)	0.0	0.00	0.000	0.000	
2	Pertigaan Jl. Bekasi Raya - Jl. Pulo Gebang (Arteri)	1.3	1.30	0.145	8.711	9.0
3	Peremp. Jl. Bekasi Raya (Bawah Flyover Tol JORR E3) (Arteri)	3.1	1.80	0.162	9.739	11.1
4	Pertigaan Jl. Cacing - Jl. Rorotan (Arteri)	6.0	2.90	0.110	6.578	26.5
5	Jembatan Cakung Drain (Arteri)	6.8	0.80	0.025	1.489	32.2
6	Pertigaan Jl. Cacing - Jl. Jawa (Jalan Utama KBN) (Arteri)	8.1	1.30	0.038	2.306	33.8
7	Perempatan Jl. Cacing - Tugu Raya - Kebantenan (Arteri)	10.2	2.10	0.157	9.444	13.3
8	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	10.8	0.60	0.034	2.061	17.5
9	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	11.6	0.80	0.083	4.956	9.7
10	Pertigaan Jl. Cilincing - Jl. Kramat Jaya (Arteri)	12.3	0.70	0.063	3.756	11.2
11	Jembatan Kali Sunter (Arteri)	13.0	0.70	0.071	4.289	9.8
12	Pertigaan Jl. Jampea - Jl. Deli (RS. Koja) (Arteri)	13.6	0.60	0.054	3.250	11.1
13	Perempatan Sulawesi (Arteri)	14.2	0.60	0.097	5.833	6.2
Total			14.20	1.040	62.411	13.7

Table A1.17 (2) Average travel time and travel speed of route 1 (Morning peak outbound)

Route	1					
Time zone	Morning Peak					
Direction	Outbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perempatan Sulawesi (Arteri)	0.0	0.00	0.000	0.000	
2	Pertigaan Jl. Jampea - Jl. Deli (RS. Koja) (Arteri)	2.4	2.40	0.043	2.556	56.3
3	Jembatan Kali Sunter (Arteri)	2.9	0.50	0.021	1.267	23.7
4	Pertigaan Jl. Cilincing - Jl. Kramat Jaya (Arteri)	3.3	0.40	0.031	1.878	12.8
5	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	3.7	0.40	0.023	1.356	17.7
6	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	4.1	0.40	0.017	1.044	23.0
7	Perempatan Jl. Cacing - Tugu Raya - Kebantenan (Arteri)	4.8	0.70	0.021	1.244	33.8
8	Pertigaan Jl. Cacing - Jl. Jawa (Jalan Utama KBN) (Arteri)	6.3	1.50	0.055	3.317	27.1
9	Jembatan Cakung Drain (Arteri)	7.8	1.50	0.046	2.750	32.7
10	Pertigaan Jl. Cacing - Jl. Rorotan (Arteri)	8.7	0.90	0.038	2.294	23.5
11	Peremp. Jl. Bekasi Raya (Bawah Flyover Tol JORR E3) (Arteri)	11.2	2.50	0.154	9.228	16.3
12	Pertigaan Jl. Bekasi Raya - Jl. Pulo Gebang (Arteri)	13.6	2.40	0.055	3.306	43.6
13	Perbatasan Jakarta Timur-Kota Bekasi (Tugu Garuda) (Arteri)	14.2	0.60	0.044	2.650	13.6
Total			14.20	0.548	32.889	25.9

Table A1.17 (3) Average travel time and travel speed of route 1 (midday nonpeak inbound)

Route	1					
Time zone	Non-Peak					
Direction	Inbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perbatasan Jakarta Timur-Kota Bekasi (Tugu Garuda) (Arteri)	0.0	0.00	0.000	0.000	
2	Pertigaan Jl. Bekasi Raya - Jl. Pulo Gebang (Arteri)	1.3	1.30	0.075	4.483	17.4
3	Peremp. Jl. Bekasi Raya (Bawah Flyover Tol JORR E3) (Arteri)	3.1	1.80	0.068	4.072	26.5
4	Pertigaan Jl. Cacing - Jl. Rorotan (Arteri)	6.0	2.90	0.079	4.722	36.8
5	Jembatan Cakung Drain (Arteri)	6.8	0.80	0.026	1.578	30.4
6	Pertigaan Jl. Cacing - Jl. Jawa (Jalan Utama KBN) (Arteri)	8.1	1.30	0.026	1.556	50.1
7	Perempatan Jl. Cacing - Tugu Raya - Kebantenan (Arteri)	10.2	2.10	0.089	5.311	23.7
8	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	10.8	0.60	0.028	1.706	21.1
9	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	11.6	0.80	0.019	1.133	42.4
10	Pertigaan Jl. Cilincing - Jl. Kramat Jaya (Arteri)	12.3	0.70	0.013	0.800	52.5
11	Jembatan Kali Sunter (Arteri)	13.0	0.70	0.028	1.683	25.0
12	Pertigaan Jl. Jampia - Jl. Deli (RS. Koja) (Arteri)	13.6	0.60	0.089	5.339	6.7
13	Perempatan Sulawesi (Arteri)	14.2	0.60	0.063	3.772	9.5
Total			14.20	0.603	36.156	23.6

Table A1.17 (4) Average travel time and travel speed of route 1 (midday nonpeak outbound)

Route	1					
Time zone	Non-Peak					
Direction	Outbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perempatan Sulawesi (Arteri)	0.0	0.00	0.000	0.000	
2	Pertigaan Jl. Jampia - Jl. Deli (RS. Koja) (Arteri)	2.4	2.40	0.040	2.400	60.0
3	Jembatan Kali Sunter (Arteri)	2.9	0.50	0.049	2.956	10.2
4	Pertigaan Jl. Cilincing - Jl. Kramat Jaya (Arteri)	3.3	0.40	0.036	2.178	11.0
5	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	3.7	0.40	0.029	1.711	14.0
6	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	4.1	0.40	0.036	2.167	11.1
7	Perempatan Jl. Cacing - Tugu Raya - Kebantenan (Arteri)	4.8	0.70	0.064	3.822	11.0
8	Pertigaan Jl. Cacing - Jl. Jawa (Jalan Utama KBN) (Arteri)	6.3	1.50	0.074	4.456	20.2
9	Jembatan Cakung Drain (Arteri)	7.8	1.50	0.027	1.639	54.9
10	Pertigaan Jl. Cacing - Jl. Rorotan (Arteri)	8.7	0.90	0.020	1.172	46.1
11	Peremp. Jl. Bekasi Raya (Bawah Flyover Tol JORR E3) (Arteri)	11.2	2.50	0.099	5.922	25.3
12	Pertigaan Jl. Bekasi Raya - Jl. Pulo Gebang (Arteri)	13.6	2.40	0.058	3.467	41.5
13	Perbatasan Jakarta Timur-Kota Bekasi (Tugu Garuda) (Arteri)	14.2	0.60	0.069	4.128	8.7
Total			14.20	0.600	36.017	23.7

Table A1.18 (1) Average travel time and travel speed of route 2 (Morning peak inbound)

Route	2					
Time zone	Morning Peak					
Direction	Inbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Pertigaan akses Tol JKT-CKP - Jl. Cikarang-Cibarusah (Tol)	0.00	0.00	0.000	0.00	
2	Keluar Tol Cikarang (± Km 31+000) (Tol)	1.00	1.00	0.254	15.26	3.9
3	Bawah Jl. Akses Tol Cibitung (± Km 25+000) (Tol)	7.00	6.00	0.112	6.74	53.4
4	Bawah Jl. Raya Setu (± Km 23+800) (Tol)	8.20	1.20	0.037	2.20	32.7
5	Bawah Jl. H. Mulyadi J (Bekasi Timur) (± Km 17+000) (Tol)	15.00	6.80	0.123	7.38	55.3
6	Bawah Jl. Jend. A. Yani (Bekasi Barat) (± Km 14+000) (Tol)	18.10	3.10	0.056	3.34	55.6
7	Cikunir Junction (± Km 10+000) (Tol)	22.10	4.00	0.124	7.43	32.3
8	Atas Jl. Kali malang (KH. Noer Ali) (± Km 46+400) (Tol)	23.10	1.00	0.033	1.99	30.2
9	Atas Jl. Arteri Pdk Kopi - Kranji (Flyover St. Cakung) (± Km 50+000)	26.60	3.50	0.069	4.14	50.7
10	Atas Jl. Bekasi Raya (± Km 54+200) (Bekasi Flyover) (Tol)	30.90	4.30	0.075	4.52	57.1
11	Gerbang Tol Rorotan (± Km 58+600) (Tol)	35.30	4.40	0.192	11.53	22.9
12	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	39.30	4.00	0.269	16.12	14.9
13	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	40.20	0.90	0.040	2.38	22.7
14	Jembatan Kali Sunter (Arteri)	41.90	1.70	0.054	3.23	31.5
15	Perempatan Sulawesi (Arteri)	43.10	1.20	0.097	5.83	12.4
TOTAL			43.10	1.53	92.09	28.1

Table A1.18 (2) Average travel time and travel speed of route 2 (Morning peak outbound)

Route	2					
Time zone	Morning Peak					
Direction	Outbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perempatan Sulawesi (Arteri)	0.0	0.00	0.000	0.00	
2	Jembatan Kali Sunter (Arteri)	1.3	1.30	0.050	3.01	26.0
3	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	3.0	1.70	0.055	3.32	30.7
4	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	3.8	0.80	0.029	1.74	27.5
5	Gerbang Tol Rorotan (± Km 58+600) (Tol)	7.8	4.00	0.138	8.31	28.9
6	Atas Jl. Bekasi Raya (± Km 54+200) (Bekasi Flyover) (Tol)	12.2	4.40	0.078	4.69	56.3
7	Atas Jl. Arteri Pdk Kopi - Kranji (Flyover St. Cakung) (± Km 50+000)	16.0	3.80	0.066	3.97	57.4
8	Atas Jl. Kali malang (KH. Noer Ali) (± Km 46+400) (Tol)	20.0	4.00	0.057	3.41	70.4
9	Cikunir Junction (± Km 10+000) (Tol)	21.0	1.00	0.016	0.97	62.1
10	Bawah Jl. Jend. A. Yani (Bekasi Barat) (± Km 14+000) (Tol)	25.0	4.00	0.069	4.12	58.3
11	Bawah Jl. H. Mulyadi J (Bekasi Timur) (± Km 17+000) (Tol)	28.0	3.00	0.046	2.77	64.9
12	Bawah Jl. Raya Setu (± Km 23+800) (Tol)	35.0	7.00	0.114	6.84	61.4
13	Bawah Jl. Akses Tol Cibitung (± Km 25+000) (Tol)	36.0	1.00	0.021	1.24	48.2
14	Keluar Tol Cikarang (± Km 31+000) (Tol)	42.0	6.00	0.399	23.91	15.1
15	Pertigaan akses Tol JKT-CKP - Jl. Cikarang-Cibarusah (Tol)	43.0	1.00	0.123	7.41	8.1
TOTAL			43.00	1.26	75.71	34.1

Table A1.18 (3) Average travel time and travel speed of route 2 (midday nonpeak inbound)

Route	2
Time zone	Morning Peak
Direction	Outbound

Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Pertigaan akses Tol JKT-CKP - Jl. Cikarang-Cibarusah (Tol)	0.00	0.00	0.000	0.00	
2	Keluar Tol Cikarang (± Km 31+000) (Tol)	1.00	1.00	0.030	1.78	33.8
3	Bawah Jl. Akses Tol Cibitung (± Km 25+000) (Tol)	7.00	6.00	0.110	6.63	54.3
4	Bawah Jl. Raya Setu (± Km 23+800) (Tol)	8.20	1.20	0.020	1.21	59.4
5	Bawah Jl. H. Mulyadi J (Bekasi Timur) (± Km 17+000) (Tol)	15.00	6.80	0.110	6.63	61.6
6	Bawah Jl. Jend. A. Yani (Bekasi Barat) (± Km 14+000) (Tol)	18.10	3.10	0.049	2.93	63.4
7	Cikunir Junction (± Km 10+000) (Tol)	22.10	4.00	0.083	4.97	48.3
8	Atas Jl. Kali Malang (KH. Noer Ali) (± Km 46+400) (Tol)	23.10	1.00	0.025	1.49	40.3
9	Atas Jl. Arteri Pdk Kopi - Kranji (Flyover St. Cakung) (± Km 50+000)	26.60	3.50	0.055	3.33	63.1
10	Atas Jl. Bekasi Raya (± Km 54+200) (Bekasi Flyover) (Tol)	30.90	4.30	0.064	3.84	67.2
11	Gerbang Tol Rorotan (± Km 58+600) (Tol)	35.30	4.40	0.075	4.52	58.5
12	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	39.30	4.00	0.083	4.96	48.4
13	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	40.20	0.90	0.033	1.95	27.7
14	Jembatan Kali Sunter (Arteri)	41.90	1.70	0.392	23.49	4.3
15	Perempatan Sulawesi (Arteri)	43.10	1.20	0.065	3.89	18.5
TOTAL			43.10	1.19	71.62	36.1

Table A1.18 (4) Average travel time and travel speed of route 2 (midday nonpeak inbound)

Route	2
Time zone	Non-peak
Direction	outbound

Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perempatan Sulawesi (Arteri)	0.0	0.00	0.000	0.00	
2	Jembatan Kali Sunter (Arteri)	1.3	1.30	0.079	4.77	16.4
3	Pertigaan Jl. Cilincing - Jl. Cakung (Arteri)	3.0	1.70	0.102	6.14	16.6
4	Pertigaan Jl. Cacing - Jl. Akses Marunda (Arteri)	3.8	0.80	0.040	2.40	20.0
5	Gerbang Tol Rorotan (± Km 58+600) (Tol)	7.8	4.00	0.153	9.17	26.2
6	Atas Jl. Bekasi Raya (± Km 54+200) (Bekasi Flyover) (Tol)	12.2	4.40	0.105	6.33	41.7
7	Atas Jl. Arteri Pdk Kopi - Kranji (Flyover St. Cakung) (± Km 50+000)	16.0	3.80	0.079	4.76	47.9
8	Atas Jl. Kali Malang (KH. Noer Ali) (± Km 46+400) (Tol)	20.0	4.00	0.067	4.04	59.3
9	Cikunir Junction (± Km 10+000) (Tol)	21.0	1.00	0.031	1.88	31.9
10	Bawah Jl. Jend. A. Yani (Bekasi Barat) (± Km 14+000) (Tol)	25.0	4.00	0.101	6.06	39.6
11	Bawah Jl. H. Mulyadi J (Bekasi Timur) (± Km 17+000) (Tol)	28.0	3.00	0.076	4.59	39.2
12	Bawah Jl. Raya Setu (± Km 23+800) (Tol)	35.0	7.00	0.186	11.16	37.6
13	Bawah Jl. Akses Tol Cibitung (± Km 25+000) (Tol)	36.0	1.00	0.048	2.86	21.0
14	Keluar Tol Cikarang (± Km 31+000) (Tol)	42.0	6.00	0.198	11.88	30.3
15	Pertigaan akses Tol JKT-CKP - Jl. Cikarang-Cibarusah (Tol)	43.0	1.00	0.065	3.92	15.3
TOTAL			43.00	1.33	79.95	32.3

Table A1.19 (1) Average travel time and travel speed of route 3 (Morning peak inbound)

Route	3					
Time zone	Morning Peak					
Direction	Inbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Akses Keluar/ Masuk Tol Citeureup (Jl. Mayor Oking Cibinong)	0.00	0.00	0.000	0.00	
2	Bawah Jembatan Akses Tol Gunung Putri (± Km 24+500) (Tol)	3.00	3.00	0.055	3.28	54.9
3	Bawah Jembatan Akses Tol Cimanggis (± Km 19+600) (Tol)	7.80	4.80	0.076	4.53	63.5
4	Gerbang Tol Barrier Cibubur (± Km 14+200) (Tol)	13.40	5.60	0.096	5.77	58.2
5	Bawah Jl. Lapangan Tembak - Jl. Munjul Raya (± Km 12+000) (Tol)	15.60	2.20	0.105	6.28	21.0
6	TMII Junction / KP. Rambutan (± Km 6+800) (Tol)	20.80	5.20	0.156	9.38	33.3
7	Bawah Jl. Pondok Gede Raya (± Km 4+800) (Tol)	22.80	2.00	0.289	17.31	6.9
8	Bawah Jl. Cililitan Besar (± Km 2+200) (Tol)	25.40	2.60	0.217	13.01	12.0
9	Atas Jakarta Interchange/ Cawang (± Km 0+000) (Tol)	27.60	2.20	0.137	8.23	16.0
10	Atas Peremp. Jl. Mayjen A. Yani-Jl. Jend. Basuki R (± Km 2+600) (T	30.20	2.60	0.047	2.83	55.1
11	Atas Peremp. Jl. Mayjen A. Yani-Jl. Bekasi Raya (± Km 3+600) (Tol	31.30	1.10	0.020	1.23	53.8
12	Atas Peremp. Jl. Mayjen A. Yani-Jl. Pramuka-Jl. Pemuda (± Km 6+000	33.70	2.40	0.051	3.08	46.8
13	Atas Peremp. Jl. Mayjen A. Yani - Jl. Lj. Suprpto - Perintis Kemerdek	36.70	3.00	0.060	3.61	49.9
14	Atas Peremp. Jl. Yos Sudarso - Jl. Boulevar Barat (± Km 11+000) (Tc	38.70	2.00	0.059	3.53	34.0
15	Tanjung Priok Tol Plaza (± Km 13+000) (Tol)	40.70	2.00	0.043	2.59	46.4
16	Pertigaan Enggano	43.30	2.60	0.074	4.41	35.4
17	Perempatan Sulawesi	43.60	0.30	0.013	0.81	22.3
TOTAL			43.60	1.50	89.88	29.1

Table A1.19 (2) Average travel time and travel speed of route 3 (Morning peak outbound)

Route	3					
Time zone	Morning Peak					
Direction	Outbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perempatan Sulawesi (Arteri)	0.0	0.00	0.000	0.00	
2	Pertigaan Enggano (Arteri)	0.3	0.30	0.018	1.06	17.0
3	Tanjung Priok Tol Plaza (± Km 13+000) (Tol)	3.0	2.70	0.092	5.54	29.2
4	Atas Peremp. Jl. Yos Sudarso - Jl. Boulevar Barat (± Km 11+000) (Tc	5.1	2.10	0.048	2.88	43.7
5	Atas Peremp. Jl.Mayjen A. Yani - Jl. Lj. Suprpto - Perintis Kemerdeka	7.0	1.90	0.039	2.36	48.4
6	Atas Peremp. Jl. Mayjen A. Yani-Jl. Pramuka-Jl. Pemuda (± Km 6+000	10.0	3.00	0.055	3.28	54.9
7	Atas Peremp. Jl. Mayjen A. Yani - Jl. Bekasi Raya (± Km 3+500) (To	12.4	2.40	0.046	2.76	52.2
8	Atas Peremp. Jl. Mayjen A. Yani - Jl. Jend. Basuki R (± Km 2+400) (13.4	1.00	0.019	1.14	52.7
9	Atas Jakarta Interchange/ Cawang (± Km 0+000) (Tol)	16.0	2.60	0.043	2.56	61.0
10	Bawah Jl. Cililitan Besar (± Km 2+200) (Tol)	18.2	2.20	0.038	2.26	58.4
11	Bawah Jl. Pondok Gede Raya (± Km 4+800) (Tol)	20.2	2.00	0.046	2.74	43.8
12	TMII Junction / KP. Rambutan (± Km 6+800) (Tol)	25.3	5.10	0.054	3.22	95.1
13	Bawah Jl. Lapangan Tembak - Jl. Munjul Raya (± Km 12+000) (Tol)	27.5	2.20	0.080	4.78	27.6
14	Gerbang Tol Barrier Cibubur (± Km 14+200) (Tol)	32.8	5.30	0.063	3.76	84.7
15	Bawah Jembatan Akses Tol Cimanggis (± Km 19+600) (Tol)	37.8	5.00	0.098	5.89	50.9
16	Bawah Jembatan Akses Tol Gunung Putri (± Km 24+500) (Tol)	42.7	4.90	0.088	5.25	56.0
17	Akses Keluar/ Masuk Tol Citeureup (Jl. Mayor Oking Cibinong)	45.6	2.90	0.054	3.24	53.7
TOTAL			45.60	0.88	52.70	51.9

Table A1.19 (3) Average travel time and travel speed of route 3 (midday nonpeak inbound)

Route	3					
Time zone	Non Peak					
Direction	Outbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Akses Keluar/ Masuk Tol Citeureup (Jl. Mayor Oking Cibinong)	0.00	0.00	0.000	0.00	
2	Bawah Jembatan Akses Tol Gunung Putri (± Km 24+500) (Tol)	3.00	3.00	0.053	3.15	57.1
3	Bawah Jembatan Akses Tol Cimanggis (± Km 19+600) (Tol)	7.80	4.80	0.083	4.96	58.1
4	Gerbang Tol Barrier Cibubur (± Km 14+200) (Tol)	13.40	5.60	0.103	6.18	54.4
5	Bawah Jl. Lapangan Tembak - Jl. Munjul Raya (± Km 12+000) (Tol)	15.60	2.20	0.041	2.45	53.9
6	TMII Junction / KP. Rambutan (± Km 6+800) (Tol)	20.80	5.20	0.094	5.61	55.6
7	Bawah Jl. Pondok Gede Raya (± Km 4+800) (Tol)	22.80	2.00	0.066	3.97	30.2
8	Bawah Jl. Cililitan Besar (± Km 2+200) (Tol)	25.40	2.60	0.193	11.59	13.5
9	Atas Jakarta Interchange/ Cawang (± Km 0+000) (Tol)	27.60	2.20	0.159	9.56	13.8
10	Atas Peremp. Jl. Mayjen A. Yani-Jl. Jend. Basuki R (± Km 2+600) (T	30.20	2.60	0.101	6.04	25.8
11	Atas Peremp. Jl. Mayjen A. Yani-Jl. Bekasi Raya (± Km 3+600) (Tol	31.30	1.10	0.024	1.43	46.0
12	Atas Peremp. Jl. Mayjen A. Yani-Jl. Pramuka-Jl. Pemuda (± Km 6+000	33.70	2.40	0.063	3.77	38.2
13	Atas Peremp. Jl. Mayjen A. Yani - Jl. Lj. Suprpto - Perintis Kemerdeka	36.70	3.00	0.054	3.24	55.6
14	Atas Peremp. Jl. Yos Sudarso - Jl. Boulevar Barat (± Km 11+000) (Tc	38.70	2.00	0.035	2.12	56.7
15	Tanjung Priok Tol Plaza (± Km 13+000) (Tol)	40.70	2.00	0.055	3.32	36.1
16	Pertigaan Enggano	43.30	2.60	0.091	5.44	28.7
17	Perempatan Sulawesi	43.60	0.30	0.018	1.08	16.6
TOTAL			43.60	1.23	73.92	35.4

Table A1.19 (4) Average travel time and travel speed of route 3 (midday nonpeak inbound)

Route	3					
Time zone	non peak					
Direction	outbound					
Control No.	Check Point (Crossing street)	Distance Reading (km)	Point to Point (km)	Average (hr) (min)		Speed Ave (km/hr)
1	Perempatan Sulawesi (Arteri)	0.0	0.00	0.000	0.00	
2	Pertigaan Enggano (Arteri)	0.3	0.30	0.016	0.96	18.7
3	Tanjung Priok Tol Plaza (± Km 13+000) (Tol)	3.0	2.70	0.113	6.75	24.0
4	Atas Peremp. Jl. Yos Sudarso - Jl. Boulevar Barat (± Km 11+000) (Tc	5.1	2.10	0.041	2.49	50.6
5	Atas Peremp. Jl. Mayjen A. Yani - Jl. Lj. Suprpto - Perintis Kemerdeka	7.0	1.90	0.043	2.59	43.9
6	Atas Peremp. Jl. Mayjen A. Yani-Jl. Pramuka-Jl. Pemuda (± Km 6+000	10.0	3.00	0.066	3.98	45.2
7	Atas Peremp. Jl. Mayjen A. Yani - Jl. Bekasi Raya (± Km 3+500) (To	12.4	2.40	0.049	2.91	49.5
8	Atas Peremp. Jl. Mayjen A. Yani - Jl. Jend. Basuki R (± Km 2+400) (13.4	1.00	0.022	1.33	45.0
9	Atas Jakarta Interchange/ Cawang (± Km 0+000) (Tol)	16.0	2.60	0.052	3.10	50.3
10	Bawah Jl. Cililitan Besar (± Km 2+200) (Tol)	18.2	2.20	0.044	2.67	49.5
11	Bawah Jl. Pondok Gede Raya (± Km 4+800) (Tol)	20.2	2.00	0.051	3.05	39.3
12	TMII Junction / KP. Rambutan (± Km 6+800) (Tol)	25.3	5.10	0.037	2.22	138.0
13	Bawah Jl. Lapangan Tembak - Jl. Munjul Raya (± Km 12+000) (Tol)	27.5	2.20	0.094	5.63	23.4
14	Gerbang Tol Barrier Cibubur (± Km 14+200) (Tol)	32.8	5.30	0.055	3.27	97.2
15	Bawah Jembatan Akses Tol Cimanggis (± Km 19+600) (Tol)	37.8	5.00	0.100	6.01	50.0
16	Bawah Jembatan Akses Tol Gunung Putri (± Km 24+500) (Tol)	42.7	4.90	0.090	5.40	54.4
17	Akses Keluar/ Masuk Tol Citeureup (Jl. Mayor Oking Cibinong)	45.6	2.90	0.050	3.02	57.7
TOTAL			45.60	0.92	55.38	49.4

Table A1.20 (1) Average travel time and travel speed of route 4 (Morning peak inbound)

Route	4					
Time zone	Morning Peak					
Direction	Inbound					
Control No.	Check Point (Crossing street)	Distance	Point	Average		Speed Ave
		Reading (km)	to Point (km)	(hr)	(min)	(km/hr)
1	Keluar / Masuk Tol Balaraja Timur (± Km 36+000) (Tol)	0.00	0.00	0.000	0.00	
2	Gerbang Tol Plaza Cikupa (Tol)	4.70	4.70	0.180	10.78	26.2
3	Bawah Flyover Jl. GT. Suprpto / Bitung (± Km 26+800) (Tol)	9.70	5.00	0.099	5.96	50.4
4	Bawah Flyover Jl. Imam Bonjol / Karawaci (± Km 21+000) (Tol)	15.50	5.80	0.110	6.59	52.8
5	Bawah Flyover Jl. Serpong Raya / Tangerang (± Km 19+000) (Tol)	17.60	2.10	0.039	2.35	53.6
6	Bawah Flyover Jl. KH. Hasyim Ashari / Pinang Raya (± Km 13+000) (Tol)	23.50	5.90	0.136	8.14	43.5
7	Gerbang Tol Plaza Karang Tengah (± Km 9+500) (Tol)	27.00	3.50	0.093	5.59	37.6
8	Kb. Jeruk Interchange (± Km 7+400) (Tol)	29.10	2.10	0.076	4.57	27.6
9	Bawah Flyover Jl. Pesanggrahan (± Km 4+800) (Tol)	31.70	2.60	0.331	19.88	7.8
10	Bawah Flyover Jl. Tanjung Duren-Jl. Batusari (± Km 1+600) (Tol)	34.80	3.10	0.439	26.31	7.1
11	Mall Taman Anggrek / Masuk ke Tol Tomang (± Km 13+600) (Tol)	36.90	2.10	0.128	7.69	16.4
12	Perempatan Jl. Daan Mogot-Jl. Kyai Tapa (± Km 15+000) (Tol)	38.30	1.40	0.033	1.97	42.6
13	Atas Peremp. Jl P. Tubagus Angke (± Km 17+800) (Tol)	41.10	2.80	0.048	2.89	58.0
14	Pluit Interchange (± Km 19+000) (Tol)	42.30	1.20	0.023	1.38	52.3
15	Atas Jl. Gedong Panjang (± Km 22+600) (Tol)	44.90	2.60	0.055	3.28	47.6
16	Atas Interchange Ancol (Arah Kemayoran) (± Km 18+800) (Tol)	48.70	3.80	0.078	4.67	48.9
17	Masuk. Gbng. Tol Tj. Priok (Sunter)/ Keluar Arah Pel. Tj. Priok (Arteri)	54.00	5.30	0.118	7.09	44.8
18	Pertigaan Enggano (Arteri)	56.80	2.80	0.106	6.34	26.5
19	Perempatan Sulawesi (Arteri)	57.1	0.30	0.018	1.07	16.8
		TOTAL	57.10	2.11	126.56	27.1

Table A1.20 (2) Average travel time and travel speed of route 4 (Morning peak outbound)

Route	4					
Time zone	Morning Peak					
Direction	Outbound					
Control No.	Check Point (Crossing street)	Distance	Point	Average		Speed Ave
		Reading (km)	to Point (km)	(hr)	(min)	(km/hr)
1	Perempatan Sulawesi (Arteri)	0.00	0.00	0.000	0.00	
2	Pertigaan Enggano (Arteri)	0.30	0.30	0.105	6.29	2.9
3	Masuk. Gbng. Tol Tj. Priok (Sunter)/ Keluar Arah Pel. Tj. Priok (Arteri)	5.00	4.70	0.242	14.49	19.5
4	Atas Interchange Ancol (Arah Kemayoran) (± Km 18+800) (Tol)	10.50	5.50	0.150	9.01	36.6
5	Atas Jl. Gedong Panjang (± Km 22+700) (Tol)	14.30	3.80	0.114	6.85	33.3
6	Pluit Interchange (± Km 19+000) (Tol)	16.90	2.60	0.045	2.73	57.2
7	Atas Peremp. Jl P. Tubagus Angke (± Km 17+800) (Tol)	18.10	1.20	0.029	1.72	41.8
8	Perempatan Jl. Daan Mogot-Jl. Kyai Tapa (± Km 15+000) (Arteri)	20.90	2.80	0.125	7.52	22.3
9	Mall Taman Anggrek / Masuk ke Tol Tomang (± Km 13+600) (Dari Tol)	22.40	1.50	0.108	6.49	13.9
10	Bawah Flyover Jl. Tanjung Duren-Jl. Batusari (± Km 1+600) (Tol)	24.30	1.90	0.056	3.39	33.6
11	Bawah Flyover Jl. Pesanggrahan (± Km 4+800) (Tol)	27.50	3.20	0.072	4.30	44.7
12	Kb. Jeruk Interchange (± Km 7+400) (Tol)	30.10	2.60	0.060	3.57	43.7
13	Gerbang Tol Plaza Karang Tengah (± Km 9+500) (Tol)	32.20	2.10	0.050	2.98	42.2
14	Bawah Flyover Jl. KH. Hasyim Ashari / Pinang Raya (± Km 13+000) (Tol)	35.70	3.50	0.083	4.98	42.2
15	Bawah Flyover Jl. Serpong Raya / Tangerang (± Km 19+000) (Tol)	41.70	6.00	0.111	6.68	53.9
16	Bawah Flyover Jl. Imam Bonjol / Karawaci (± Km 21+000) (Tol)	43.70	2.00	0.040	2.38	50.3
17	Bawah Flyover Jl. GT. Suprpto / Bitung (± Km 26+800) (Tol)	49.60	5.90	0.141	8.46	41.8
18	Gerbang Tol Plaza Cikupa (Tol)	54.50	4.90	0.123	7.37	39.9
19	Keluar / Masuk Tol Balaraja Timur (± Km 36+000) (Tol)	59.20	4.70	0.105	6.32	44.6
		TOTAL	59.20	1.76	105.54	33.7

Table A1.20 (3) Average travel time and travel speed of route 4 (midday nonpeak inbound)

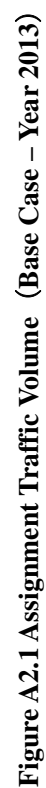
Route	4					
Time zone	Non peak					
Direction	outbound					
Control No.	Check Point (Crossing street)	Distance	Point	Average		Speed Ave (km/hr)
		Reading (km)	to Point (km)	(hr)	(min)	
1	Keluar / Masuk Tol Balaraja Timur (± Km 36+000) (Tol)	0.00	0.00	0.000	0.00	
2	Gerbang Tol Plaza Cikupa (Tol)	4.70	4.70	0.131	7.87	35.8
3	Bawah Flyover Jl. GT. Suprpto / Bitung (± Km 26+800) (Tol)	9.70	5.00	0.110	6.58	45.6
4	Bawah Flyover Jl. Imam Bonjol / Karawaci (± Km 21+000) (Tol)	15.50	5.80	0.112	6.73	51.7
5	Bawah Flyover Jl. Serpong Raya / Tangerang (± Km 19+000) (Tol)	17.60	2.10	0.042	2.51	50.3
6	Bawah Flyover Jl. KH. Hasyim Ashari / Pinang Raya (± Km 13+000) (Tol)	23.50	5.90	0.118	7.10	49.9
7	Gerbang Tol Plaza Karang Tengah (± Km 9+500) (Tol)	27.00	3.50	0.074	4.44	47.3
8	Kb. Jeruk Interchange (± Km 7+400) (Tol)	29.10	2.10	0.058	3.46	36.5
9	Bawah Flyover Jl. Pesanggrahan (± Km 4+800) (Tol)	31.70	2.60	0.079	4.74	32.9
10	Bawah Flyover Jl. Tanjung Duren-Jl. Batusari (± Km 1+600) (Tol)	34.80	3.10	0.150	8.98	20.7
11	Mall Taman Anggrek / Masuk ke Tol Tomang (± Km 13+600) (Tol)	36.90	2.10	0.121	7.24	17.4
12	Perempatan Jl. Daan Mogot-Jl. Kyai Tapa (± Km 15+000) (Tol)	38.30	1.40	0.036	2.18	38.6
13	Atas Peremp. Jl P. Tubagus Angke (± Km 17+800) (Tol)	41.10	2.80	0.075	4.48	37.5
14	Pluit Interchange (± Km 19+000) (Tol)	42.30	1.20	0.047	2.83	25.4
15	Atas Jl. Gedong Panjang (± Km 22+600) (Tol)	44.90	2.60	0.140	8.40	18.6
16	Atas Interchange Ancol (Arah Kemayoran) (± Km 18+800) (Tol)	48.70	3.80	0.109	6.54	34.8
17	Masuk. Gbng. Tol Tj. Priok (Sunter)/ Keluar Arah Pel. Tj. Priok (Arteri)	54.00	5.30	0.220	13.22	24.1
18	Pertigaan Enggano (Arteri)	56.80	2.80	0.123	7.35	22.9
19	Perempatan Sulawesi (Arteri)	57.1	0.30	0.037	2.20	8.2
		TOTAL	57.10	1.78	106.86	32.1

Table A1.20 (4) Average travel time and travel speed of route 4 (midday nonpeak inbound)

Route	4					
Time zone	non peak					
Direction	outbound					
Control No.	Check Point (Crossing street)	Distance	Point	Average		Speed Ave (km/hr)
		Reading (km)	to Point (km)	(hr)	(min)	
1	Perempatan Sulawesi (Arteri)	0.00	0.00	0.000	0.00	
2	Pertigaan Enggano (Arteri)	0.30	0.30	0.016	0.97	18.6
3	Masuk. Gbng. Tol Tj. Priok (Sunter)/ Keluar Arah Pel. Tj. Priok (Arteri)	5.00	4.70	0.499	29.92	9.4
4	Atas Interchange Ancol (Arah Kemayoran) (± Km 18+800) (Tol)	10.50	5.50	0.124	7.43	44.4
5	Atas Jl. Gedong Panjang (± Km 22+700) (Tol)	14.30	3.80	0.101	6.06	37.6
6	Pluit Interchange (± Km 19+000) (Tol)	16.90	2.60	0.045	2.70	57.8
7	Atas Peremp. Jl P. Tubagus Angke (± Km 17+800) (Tol)	18.10	1.20	0.024	1.45	49.7
8	Perempatan Jl. Daan Mogot-Jl. Kyai Tapa (± Km 15+000) (Arteri)	20.90	2.80	0.160	9.62	17.5
9	Mall Taman Anggrek / Masuk ke Tol Tomang (± Km 13+600) (Tol)	22.40	1.50	0.128	7.66	11.7
10	Bawah Flyover Jl. Tanjung Duren-Jl. Batusari (± Km 1+600) (Tol)	24.30	1.90	0.054	3.22	35.4
11	Bawah Flyover Jl. Pesanggrahan (± Km 4+800) (Tol)	27.50	3.20	0.064	3.85	49.9
12	Kb. Jeruk Interchange (± Km 7+400) (Tol)	30.10	2.60	0.048	2.86	54.5
13	Gerbang Tol Plaza Karang Tengah (± Km 9+500) (Tol)	32.20	2.10	0.055	3.32	38.0
14	Bawah Flyover Jl. KH. Hasyim Ashari / Pinang Raya (± Km 13+000) (Tol)	35.70	3.50	0.065	3.92	53.5
15	Bawah Flyover Jl. Serpong Raya / Tangerang (± Km 19+000) (Tol)	41.70	6.00	0.097	5.83	61.7
16	Bawah Flyover Jl. Imam Bonjol / Karawaci (± Km 21+000) (Tol)	43.70	2.00	0.036	2.15	55.8
17	Bawah Flyover Jl. GT. Suprpto / Bitung (± Km 26+800) (Tol)	49.60	5.90	0.181	10.88	32.5
18	Gerbang Tol Plaza Cikupa (Tol)	54.50	4.90	0.083	4.98	59.0
19	Keluar / Masuk Tol Balaraja Timur (± Km 36+000) (Tol)	59.20	4.70	0.075	4.52	62.4
		TOTAL	59.20	1.86	111.34	31.9

APPENDIX 2

RESULTS OF TRAFFIC DEMAND FORECAST







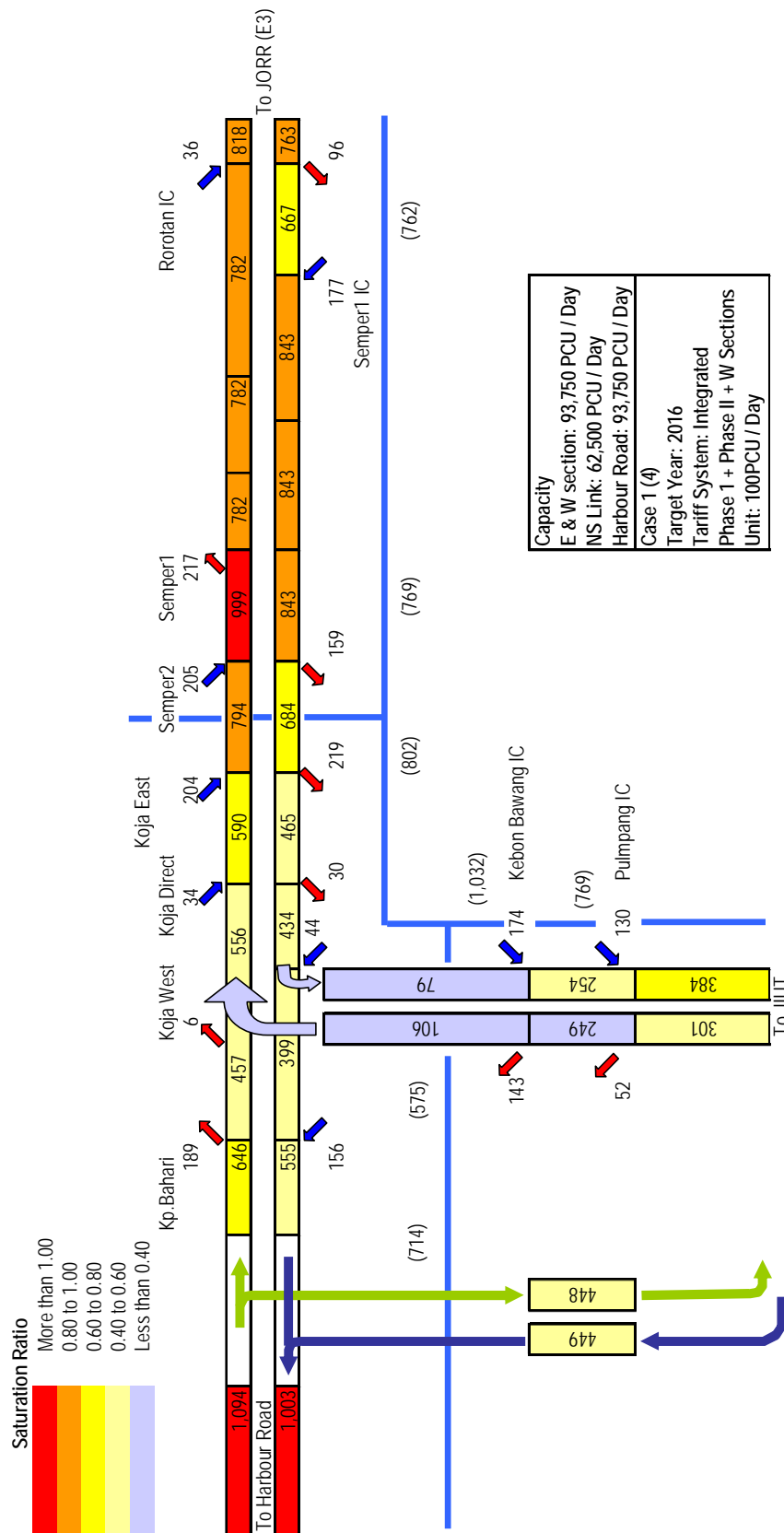


Figure A2.4 Assignment Traffic Volume (Case 1 – Year 2016)

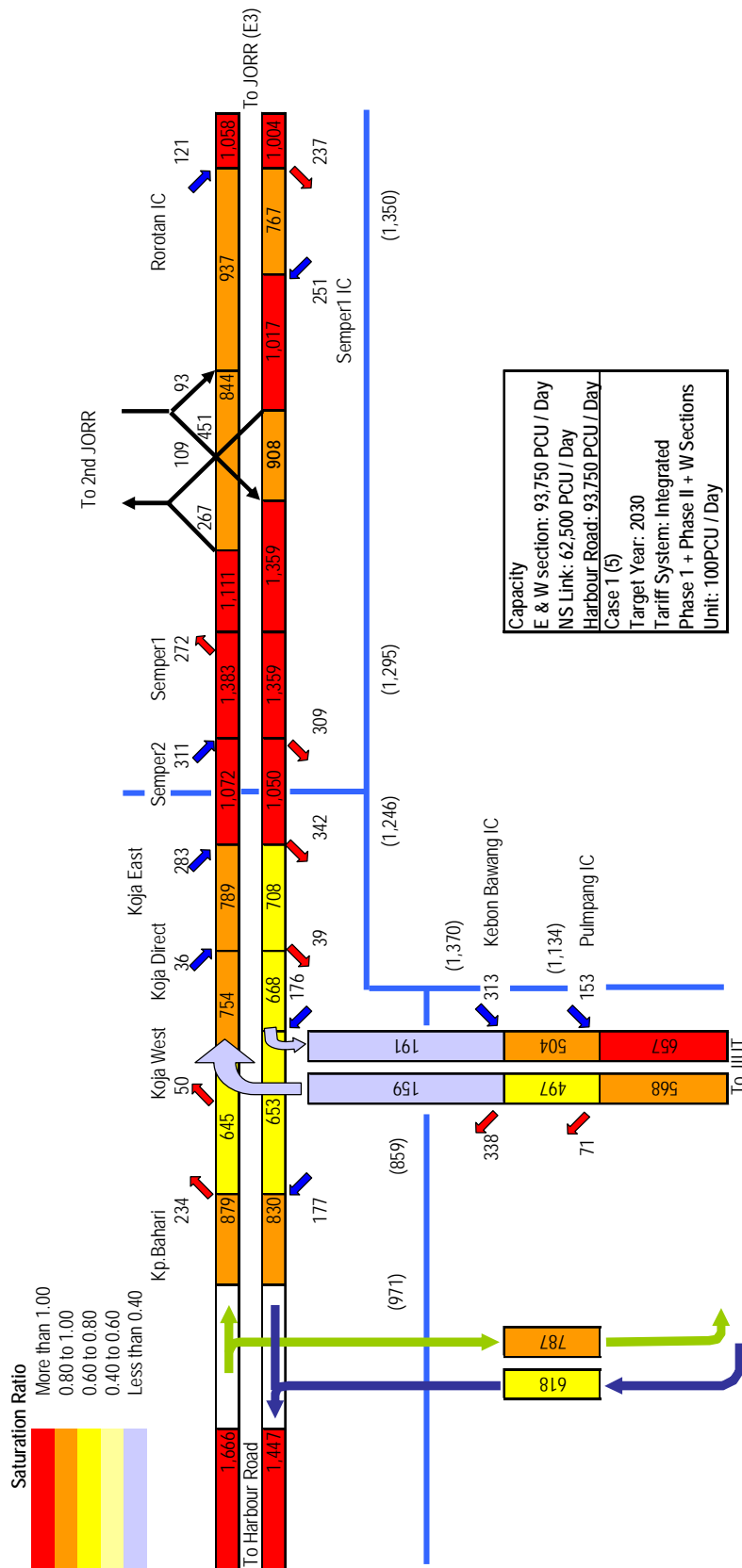


Figure A2.5 Assignment Traffic Volume (Case 1 – Year 2030)

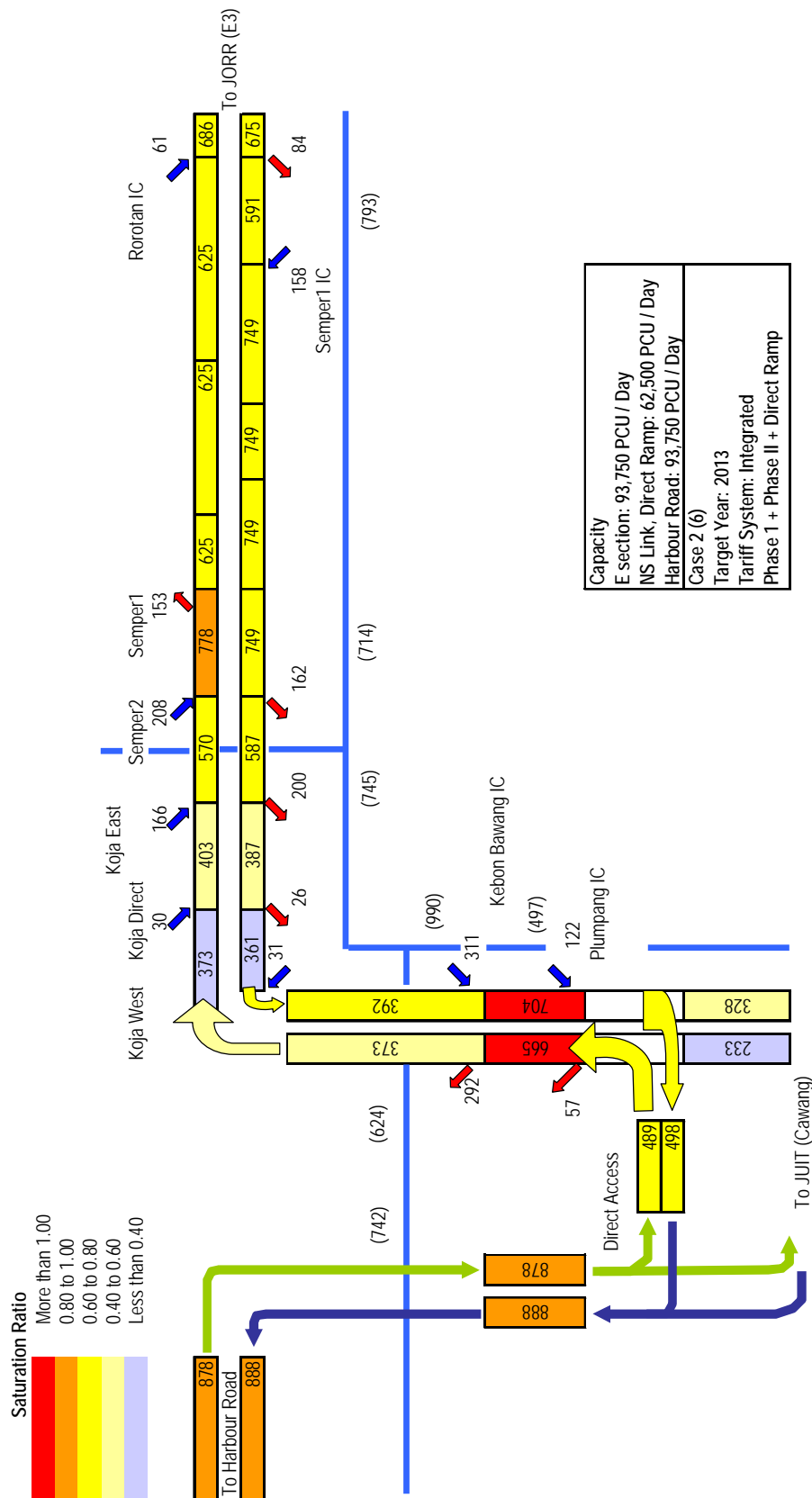


Figure A2.6 Assignment Traffic Volume (Case 2 – Year 2013)



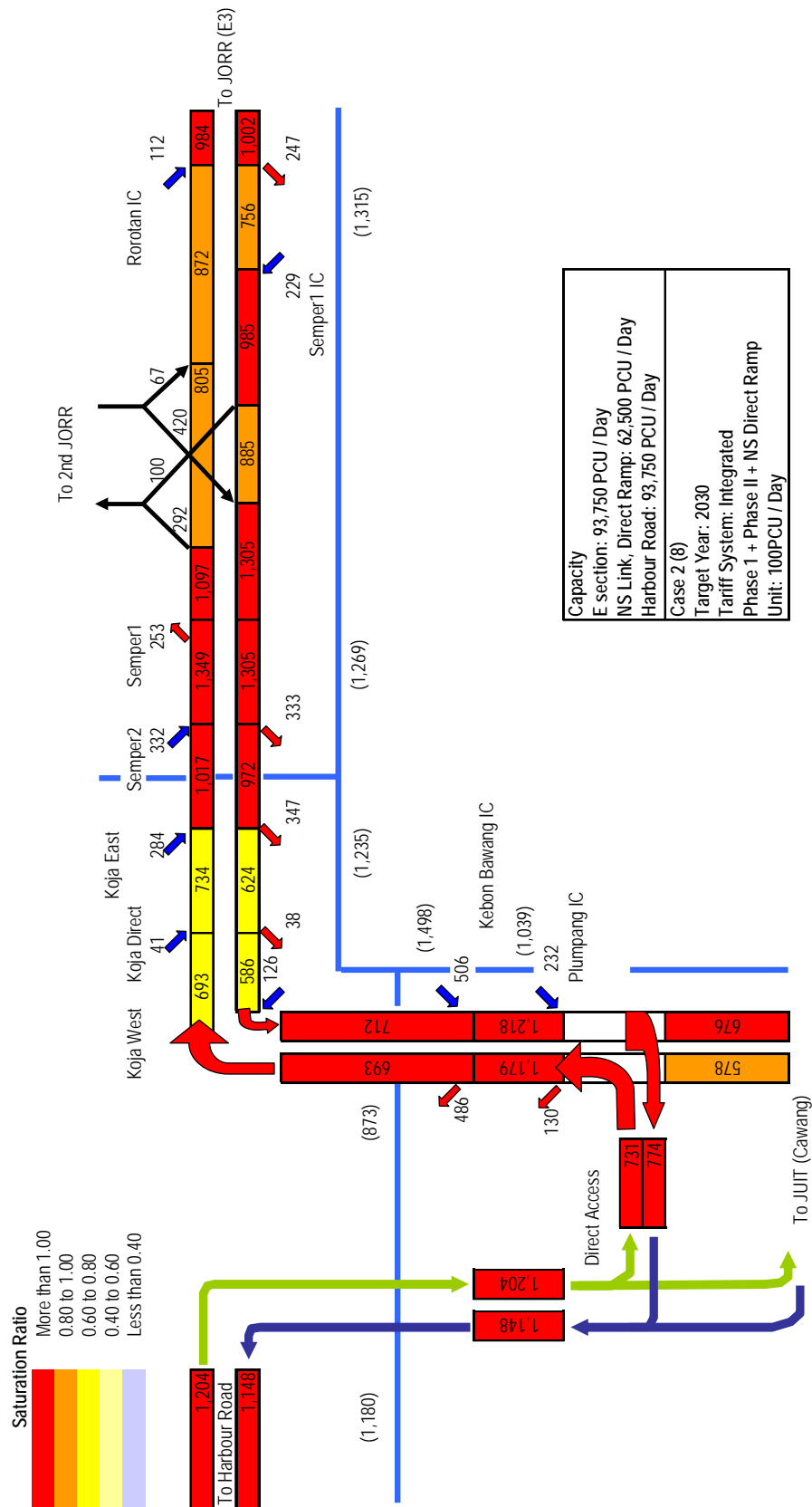
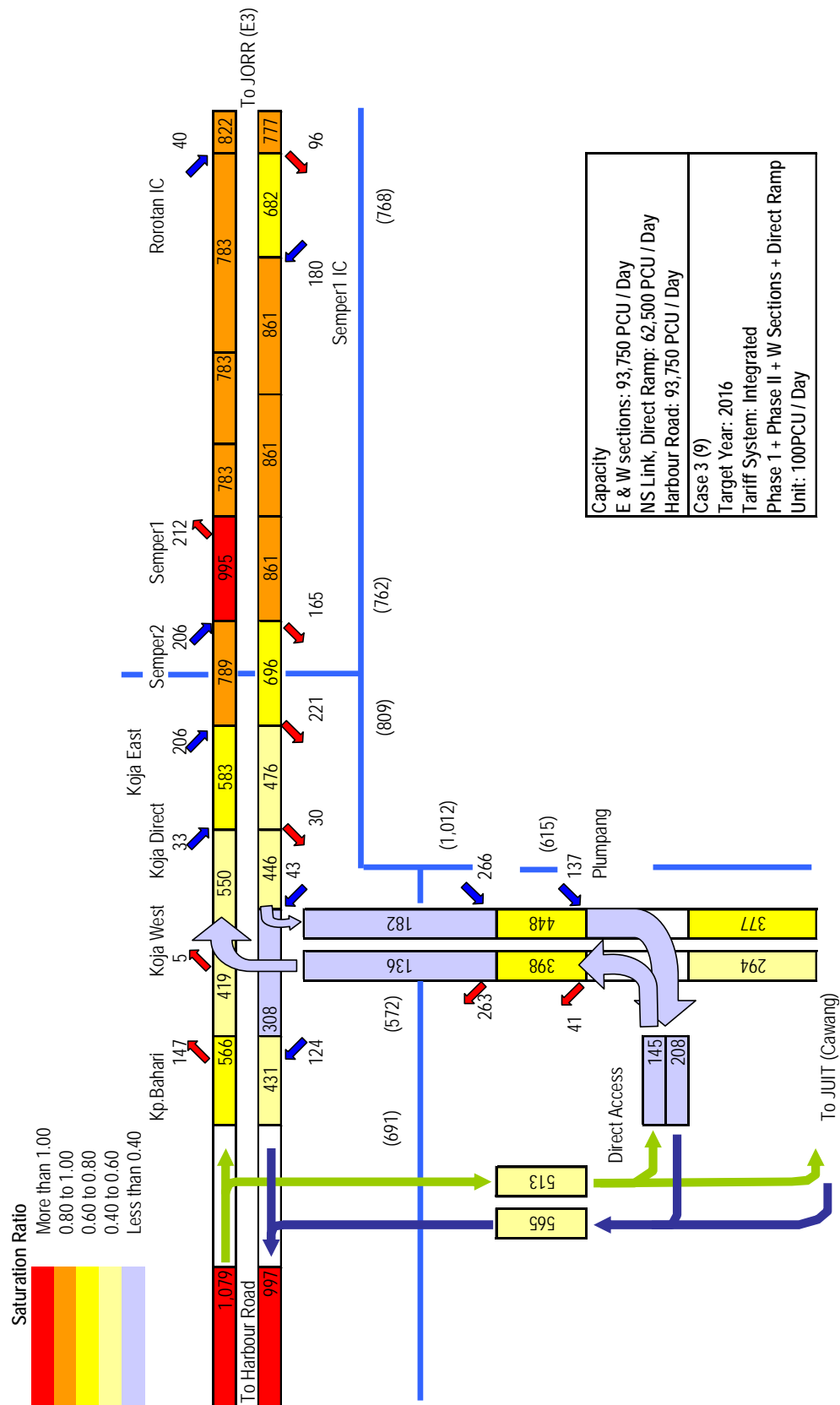
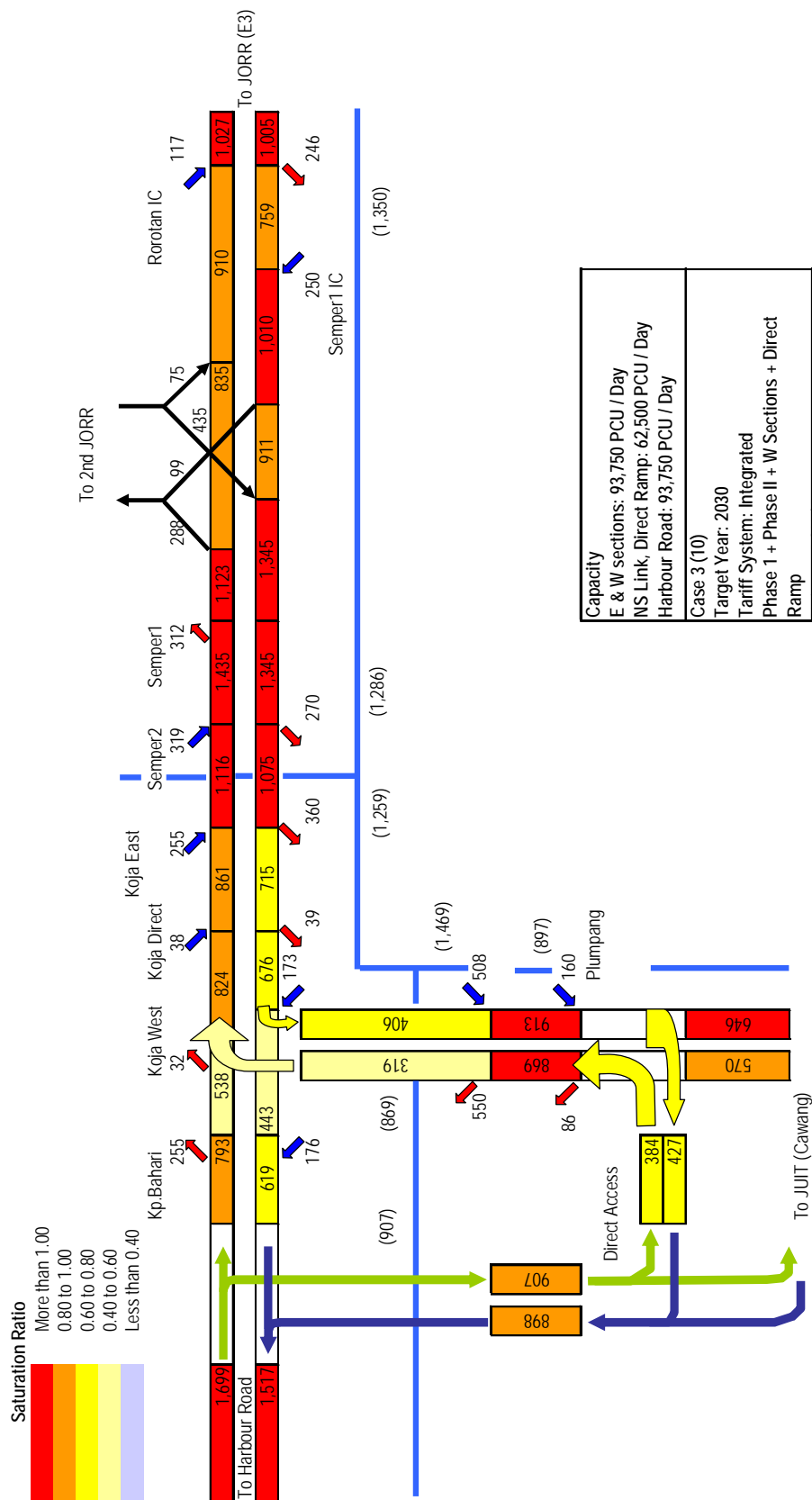


Figure A2.8 Assignment Traffic Volume (Case 2 – Year 2030)







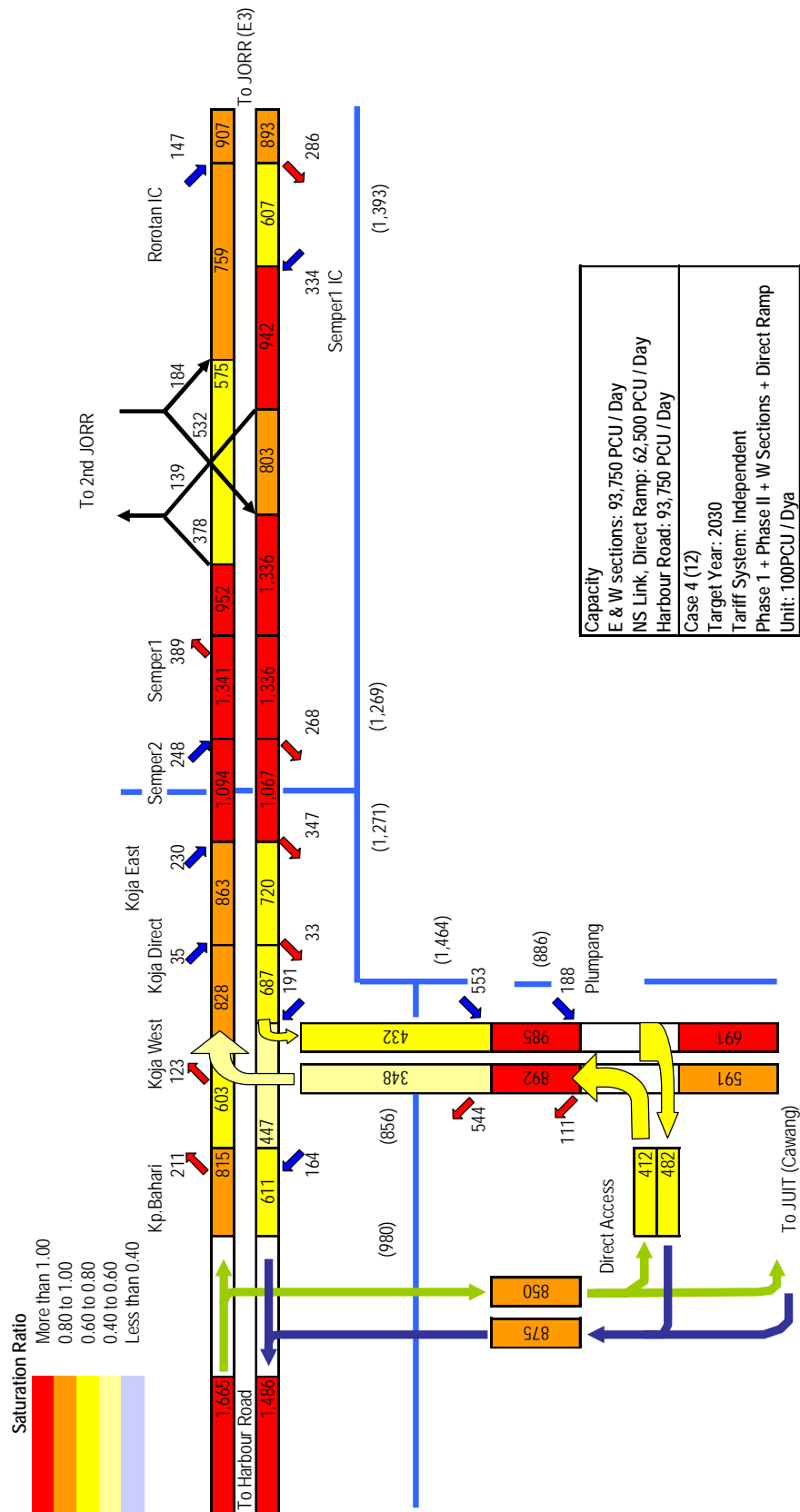


Figure A2.12 Assignment Traffic Volume (Case 4 – Year 2030)

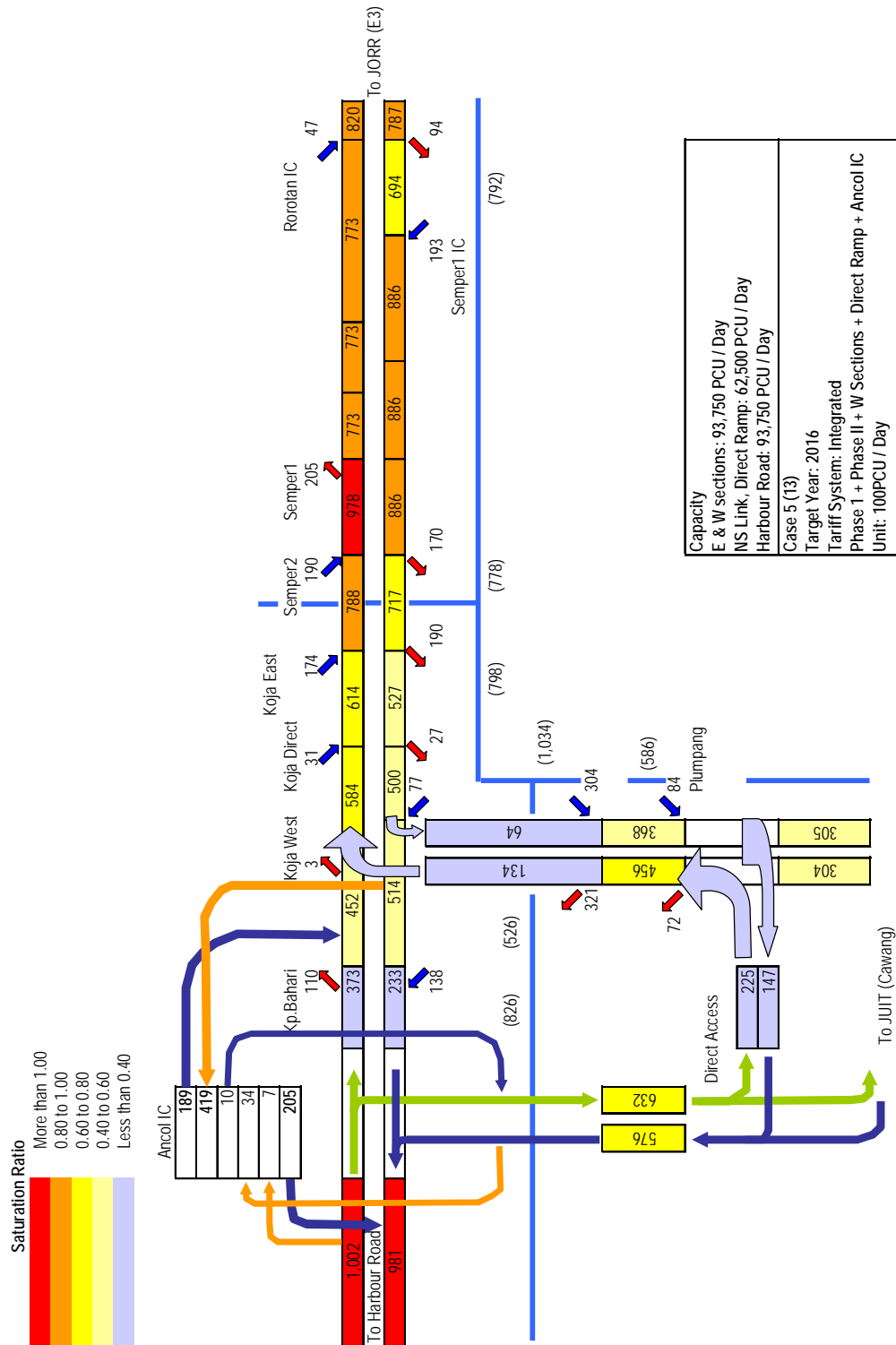


Figure A2.13 Assignment Traffic Volume (Case 5 – Year 2016)

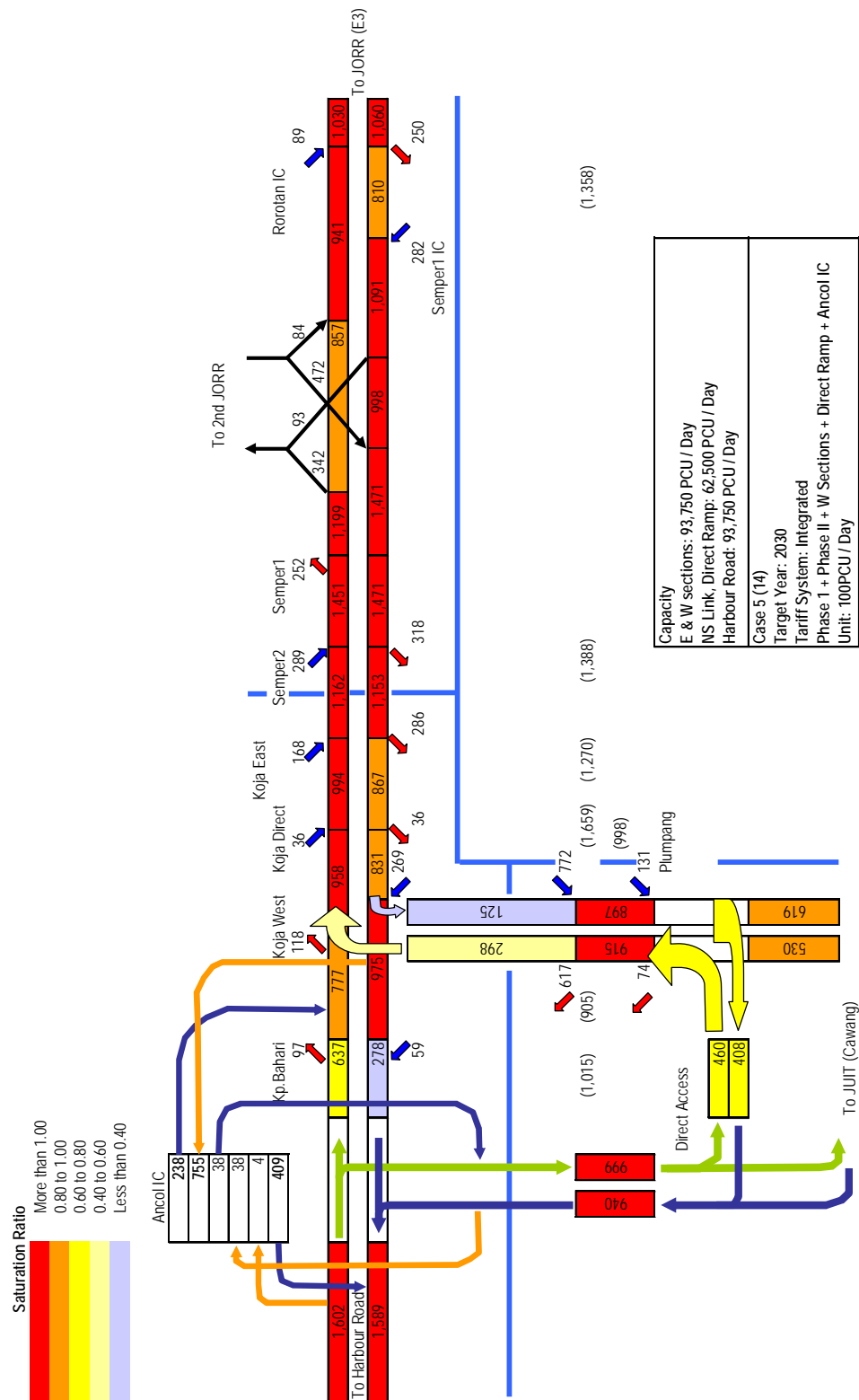


Figure A2.14 Assignment Traffic Volume (Case 5 – Year 2030)

APPENDIX 3

ECONOMIC AND FINANCIAL ANALYSIS

Alternative 1: Cash Flow of Economic Analysis

(Million JPY in Economic Cost)

	Cost				Benefit			Cash Flow	
	Construction	Maintenance Cost	Operating Cost	Total	Operating Costs Saving	Time Cist Saving	Total	Net Cash Flow	Discounted by 15%
2006	0.0			0.0				0.0	0.0
2007	0.0			0.0				0.0	0.0
2008	0.0			0.0				0.0	0.0
2009	0.0			0.0				0.0	0.0
2010	0.0	0.0	0.0	0.0				0.0	0.0
2011	528.0	0.0	0.0	528.0				-528.0	-262.5
2012	1,432.6	0.0	0.0	1,432.6				-1,432.6	-619.3
2013	12,911.6	0.0	0.0	12,911.6				-12,911.6	-4,854.0
2014	14,797.6	0.0	0.0	14,797.6				-14,797.6	-4,837.4
2015	6,932.4	18.2	93.8	7,044.5				-7,044.5	-2,002.5
2016		36.5	187.7	224.1	755.8	6,664.3	7,420.1	7,196.0	1,778.7
2017		36.5	193.3	229.8	716.8	6,726.4	7,443.2	7,213.4	1,550.5
2018		36.5	199.1	235.6	677.7	6,788.5	7,466.3	7,230.7	1,351.5
2019		36.5	205.1	241.5	638.7	6,850.6	7,489.3	7,247.8	1,178.0
2020		36.5	211.2	247.7	599.7	6,912.7	7,512.4	7,264.7	1,026.7
2021		36.5	217.6	254.0	560.6	6,974.8	7,535.5	7,281.4	894.8
2022		36.5	224.1	260.5	521.6	7,037.0	7,558.5	7,298.0	779.9
2023		36.5	230.8	267.3	482.5	7,099.1	7,581.6	7,314.3	679.7
2024		36.5	237.7	274.2	443.5	7,161.2	7,604.6	7,330.4	592.3
2025		36.5	244.9	281.3	404.4	7,223.3	7,627.7	7,346.4	516.2
2026		36.5	252.2	288.7	365.4	7,285.4	7,650.8	7,362.1	449.8
2027		36.5	259.8	296.2	326.3	7,347.5	7,673.8	7,377.6	392.0
2028		36.5	267.6	304.0	287.3	7,409.6	7,696.9	7,392.9	341.6
2029		36.5	275.6	312.1	248.2	7,471.7	7,720.0	7,407.9	297.6
2030		36.5	283.9	320.3	209.2	7,533.8	7,743.0	7,422.7	259.3
2031		36.5	292.4	328.8	205.1	7,386.1	7,591.2	7,262.3	220.6
2032		36.5	301.2	337.6	201.1	7,241.3	7,442.3	7,104.7	187.7
2033		36.5	310.2	346.7	197.1	7,099.3	7,296.4	6,949.8	159.6
2034		36.5	319.5	356.0	193.3	6,960.1	7,153.4	6,797.4	135.8
2035		36.5	329.1	365.5	189.5	6,823.6	7,013.1	6,647.5	115.5
2036		36.5	339.0	375.4	185.7	6,689.8	6,875.6	6,500.2	98.2
2037		36.5	349.1	385.6	182.1	6,558.7	6,740.8	6,355.2	83.5
2038		36.5	359.6	396.1	178.5	6,430.1	6,608.6	6,212.5	70.9
2039		36.5	370.4	406.8	175.0	6,304.0	6,479.0	6,072.2	60.3
2040		36.5	381.5	418.0	171.6	6,180.4	6,352.0	5,934.0	51.2
2041	-5,752.8			-5,752.8				5,752.8	43.2
Total	30,849.4	929.5	6,936.4	38,715.4	9,116.7	174,159.3	183,276.0	144,560.6	739.4

EIRR=	15.81%
NPV=	739.4
B/C=	1.057

Alternative 2: Cash Flow of Economic Analysis

(Million JPY in Economic Cost)

	Cost				Benefit			Cash Flow	
	Construction	Maintenance Cost	Operating Cost	Total	Operating Costs Saving	Time Cist Saving	Total	Net Cash Flow	Discounted by 15%
2006	0.0			0.0				0.0	0.0
2007	0.0			0.0				0.0	0.0
2008	0.0			0.0				0.0	0.0
2009	0.0			0.0				0.0	0.0
2010	0.0	0.0	0.0	0.0				0.0	0.0
2011	127.2	0.0	0.0	127.2				-127.2	-63.2
2012	968.5	0.0	0.0	968.5				-968.5	-418.7
2013	1,747.4	0.0	0.0	1,747.4				-1,747.4	-656.9
2014	309.6	-20.1	147.9	437.4	408.6	1,263.2	1,671.8	1,234.4	403.5
2015		-16.3	149.5	133.3	433.9	807.6	1,241.5	1,108.2	315.0
2016		-16.3	151.2	135.0	459.3	352.0	811.2	676.2	167.1
2017		-16.3	155.8	139.5	424.9	341.8	766.7	627.2	134.8
2018		-16.3	160.5	144.2	390.5	331.7	722.2	578.0	108.0
2019		-16.3	165.3	149.0	356.1	321.5	677.7	528.7	85.9
2020		-16.3	170.2	154.0	321.8	311.4	633.2	479.2	67.7
2021		-16.3	175.3	159.1	287.4	301.3	588.7	429.6	52.8
2022		-16.3	180.6	164.3	253.0	291.1	544.1	379.8	40.6
2023		-16.3	186.0	169.8	218.6	281.0	499.6	329.9	30.7
2024		-16.3	191.6	175.3	184.3	270.9	455.1	279.8	22.6
2025		-16.3	197.3	181.1	149.9	260.7	410.6	229.5	16.1
2026		-16.3	203.3	187.0	115.5	250.6	366.1	179.1	10.9
2027		-16.3	209.4	193.1	81.2	240.4	321.6	128.5	6.8
2028		-16.3	215.6	199.4	46.8	230.3	277.1	77.7	3.6
2029		-16.3	222.1	205.9	12.4	220.2	232.6	26.7	1.1
2030		-16.3	228.8	212.5	-22.0	210.0	188.1	-24.4	-0.9
2031		-16.3	235.6	219.4	-22.4	205.9	183.5	-35.9	-1.1
2032		-16.3	242.7	226.4	-22.8	201.9	179.0	-47.4	-1.3
2033		-16.3	250.0	233.7	-23.3	197.9	174.6	-59.1	-1.4
2034		-16.3	257.5	241.2	-23.8	194.0	170.3	-71.0	-1.4
2035		-16.3	265.2	249.0	-24.2	190.2	166.0	-83.0	-1.4
2036		-16.3	273.2	256.9	-24.7	186.5	161.8	-95.1	-1.4
2037		-16.3	281.4	265.1	-25.2	182.8	157.6	-107.5	-1.4
2038		-16.3	289.8	273.5	-25.7	179.3	153.5	-120.0	-1.4
2039		-16.3	298.5	282.2	-26.2	175.7	149.5	-132.7	-1.3
2040		-16.3	307.4	291.2	-26.8	172.3	145.5	-145.7	-1.3
2041	-3.9			-3.9				3.9	0.0
Total	3,148.8	-442.7	5,811.6	8,517.7	3,876.9	8,172.3	12,049.3	3,531.5	314.4

EIRR=	22.55%
NPV=	314.4
B/C=	1.193

Alternative 3: Cash Flow of Economic Analysis

(Million JPY in Economic Cost)

	Cost				Benefit			Cash Flow	
	Construction	Maintenance Cost	Operating Cost	Total	Operating Costs Saving	Time Cist Saving	Total	Net Cash Flow	Discounted by 15%
2006	0.0			0.0				0.0	0.0
2007	0.0			0.0				0.0	0.0
2008	0.0			0.0				0.0	0.0
2009	0.0			0.0				0.0	0.0
2010	0.0	0.0	0.0	0.0				0.0	0.0
2011	655.1	0.0	0.0	655.1				-655.1	-325.7
2012	2,401.0	0.0	0.0	2,401.0				-2,401.0	-1,038.0
2013	14,659.0	0.0	0.0	14,659.0				-14,659.0	-5,510.9
2014	15,107.3	3.8	147.9	15,258.9	408.6	1,263.2	1,671.8	-13,587.1	-4,441.7
2015	6,932.4	25.8	169.0	7,127.3	433.9	807.6	1,241.5	-5,885.8	-1,673.1
2016		44.1	190.2	234.3	1,303.4	8,164.9	9,468.2	9,234.0	2,282.5
2017		44.1	195.9	240.0	1,229.8	8,202.7	9,432.5	9,192.5	1,975.9
2018		44.1	201.8	245.9	1,156.2	8,240.6	9,396.8	9,150.9	1,710.4
2019		44.1	207.9	251.9	1,082.6	8,278.5	9,361.1	9,109.1	1,480.5
2020		44.1	214.1	258.2	1,009.0	8,316.3	9,325.3	9,067.2	1,281.5
2021		44.1	220.5	264.6	935.4	8,354.2	9,289.6	9,025.0	1,109.1
2022		44.1	227.1	271.2	861.8	8,392.1	9,253.9	8,982.7	959.9
2023		44.1	233.9	278.0	788.2	8,429.9	9,218.1	8,940.1	830.8
2024		44.1	241.0	285.0	714.6	8,467.8	9,182.4	8,897.4	719.0
2025		44.1	248.2	292.3	641.0	8,505.7	9,146.7	8,854.4	622.2
2026		44.1	255.6	299.7	567.4	8,543.5	9,111.0	8,811.3	538.4
2027		44.1	263.3	307.4	493.8	8,581.4	9,075.2	8,767.9	465.8
2028		44.1	271.2	315.3	420.2	8,619.3	9,039.5	8,724.2	403.1
2029		44.1	279.3	323.4	346.6	8,657.1	9,003.8	8,680.4	348.7
2030		44.1	287.7	331.8	273.0	8,695.0	8,968.0	8,636.3	301.7
2031		44.1	296.4	340.4	267.7	8,524.5	8,792.2	8,451.8	256.7
2032		44.1	305.2	349.3	262.4	8,357.4	8,619.8	8,270.5	218.5
2033		44.1	314.4	358.5	257.3	8,193.5	8,450.8	8,092.3	185.9
2034		44.1	323.8	367.9	252.3	8,032.8	8,285.1	7,917.2	158.1
2035		44.1	333.6	377.6	247.3	7,875.3	8,122.6	7,745.0	134.5
2036		44.1	343.6	387.6	242.5	7,720.9	7,963.4	7,575.7	114.4
2037		44.1	353.9	397.9	237.7	7,569.5	7,807.2	7,409.3	97.3
2038		44.1	364.5	408.5	233.0	7,421.1	7,654.1	7,245.6	82.7
2039		44.1	375.4	419.5	228.5	7,275.6	7,504.1	7,084.6	70.4
2040		44.1	386.7	430.7	224.0	7,132.9	7,356.9	6,926.2	59.8
2041	-62.0			-62.0				62.0	0.5
Total	39,692.8	1,131.1	7,252.2	48,076.1	15,118.2	206,623.5	221,741.7	173,665.6	3,418.8

EIRR=	18.50%
NPV=	3,418.8
B/C=	1.238

Alternative 1: Cash Flow of Financial Analysis

(Million JPY in Financial Cost)

	Cost				Income			Cash Flow	
	Construction	Maintenance Cost	Operating Cost	Total	Revenue	Other Income	Total	Net Cash Flow	Discounted by 15%
2006	225.3			225.3				-225.3	-394.0
2007	901.2			901.2				-901.2	-1,370.5
2008	2,414.7			2,414.7				-2,414.7	-3,193.4
2009	6,982.7			6,982.7				-6,982.7	-8,030.1
2010	8,359.1	13.8	120.8	8,493.8	188.6	9.4	198.1	-8,295.7	-8,295.7
2011	19,414.6	27.7	181.2	19,623.5	377.3	18.9	396.1	-19,227.3	-16,719.4
2012	14,944.5	27.7	241.6	15,213.8	565.9	28.3	594.2	-14,619.6	-11,054.5
2013	18,676.5	55.7	302.0	19,034.3	943.2	47.2	990.4	-18,044.0	-11,864.2
2014	17,409.0	83.8	643.8	18,136.6	2,033.5	101.7	2,135.1	-16,001.4	-9,148.9
2015	8,155.8	105.3	793.9	9,054.9	2,599.9	130.0	2,729.9	-6,325.0	-3,144.6
2016		126.7	944.0	1,070.7	3,166.3	158.3	3,324.7	2,254.0	974.4
2017		126.7	972.3	1,099.0	3,273.3	163.7	3,437.0	2,338.0	878.9
2018		126.7	1,001.5	1,128.2	3,384.0	169.2	3,553.2	2,425.0	792.7
2019		126.7	1,031.5	1,158.2	3,498.3	174.9	3,673.2	2,515.0	714.9
2020		126.7	1,062.5	1,189.2	3,616.5	180.8	3,797.4	2,608.2	644.7
2021		126.7	1,094.4	1,221.0	3,738.8	186.9	3,925.7	2,704.7	581.3
2022		126.7	1,127.2	1,253.9	3,865.1	193.3	4,058.4	2,804.5	524.2
2023		126.7	1,161.0	1,287.7	3,995.7	199.8	4,195.5	2,907.8	472.6
2024		126.7	1,195.8	1,322.5	4,130.8	206.5	4,337.3	3,014.8	426.1
2025		126.7	1,231.7	1,358.4	4,270.4	213.5	4,483.9	3,125.5	384.1
2026		126.7	1,268.7	1,395.4	4,414.7	220.7	4,635.4	3,240.1	346.2
2027		126.7	1,306.7	1,433.4	4,563.9	228.2	4,792.1	3,358.7	312.1
2028		126.7	1,345.9	1,472.6	4,718.1	235.9	4,954.0	3,481.4	281.3
2029		126.7	1,386.3	1,513.0	4,877.6	243.9	5,121.4	3,608.4	253.5
2030		126.7	1,427.9	1,554.6	5,042.4	252.1	5,294.5	3,739.9	228.5
2031		126.7	1,470.7	1,597.4	5,193.7	259.7	5,453.3	3,855.9	204.9
2032		126.7	1,514.8	1,641.5	5,349.5	267.5	5,617.0	3,975.4	183.7
2033		126.7	1,560.3	1,687.0	5,510.0	275.5	5,785.5	4,098.5	164.7
2034		126.7	1,607.1	1,733.8	5,675.3	283.8	5,959.0	4,225.2	147.6
2035		126.7	1,655.3	1,782.0	5,845.5	292.3	6,137.8	4,355.8	132.3
2036		126.7	1,705.0	1,831.7	6,020.9	301.0	6,321.9	4,490.3	118.6
2037		126.7	1,756.1	1,882.8	6,201.5	310.1	6,511.6	4,628.8	106.3
2038		126.7	1,808.8	1,935.5	6,387.6	319.4	6,706.9	4,771.4	95.3
2039		126.7	1,863.1	1,989.8	6,579.2	329.0	6,908.1	4,918.4	85.4
2040		126.7	1,919.0	2,045.7	6,776.6	338.8	7,115.4	5,069.7	76.6
2041	-10,090.2			-10,090.2				10,090.2	132.5
Total	87,393.0	3,481.4	36,700.8	127,575.2	126,803.9	6,340.2	133,144.0	9,110.0	-58,993.7

FIRR=	0.52%
NPV=	-40,133.5
B/C=	-2.951

Alternative 2: Cash Flow of Financial Analysis

(Million JPY in Financial Cost)

	Cost				Income			Cash Flow	
	Construction	Maintenance Cost	Operating Cost	Total	Revenue	Other Income	Total	Net Cash Flow	Discounted by 15%
2006	225.3			225.3				-225.3	-394.0
2007	901.2			901.2				-901.2	-1,370.5
2008	2,414.7			2,414.7				-2,414.7	-3,193.4
2009	6,982.7			6,982.7				-6,982.7	-8,030.1
2010	8,359.1	13.8	120.8	8,493.8	188.6	9.4	198.1	-8,295.7	-8,295.7
2011	18,943.1	27.7	181.2	19,152.0	377.3	18.9	396.1	-18,755.8	-16,309.4
2012	14,398.5	27.7	241.6	14,667.8	565.9	28.3	594.2	-14,073.6	-10,641.6
2013	5,542.1	55.7	302.0	5,899.9	943.2	47.2	990.4	-4,909.5	-3,228.1
2014	364.3	60.2	817.7	1,242.2	2,651.9	132.6	2784.5	1,542.3	881.8
2015		64.7	859.4	924.1	2,811.1	140.6	2951.6	2,027.5	1,008.0
2016		64.7	901.1	965.8	2,970.2	148.5	3118.7	2,152.9	930.8
2017		64.7	928.2	992.9	3,063.2	153.2	3216.3	2,223.5	835.9
2018		64.7	956.0	1,020.7	3,159.1	158.0	3317.0	2,296.3	750.7
2019		64.7	984.7	1,049.4	3,257.9	162.9	3420.8	2,371.4	674.1
2020		64.7	1,014.2	1,078.9	3,359.9	168.0	3527.9	2,449.0	605.3
2021		64.7	1,044.7	1,109.4	3,465.1	173.3	3638.3	2,529.0	543.6
2022		64.7	1,076.0	1,140.7	3,573.5	178.7	3752.2	2,611.5	488.1
2023		64.7	1,108.3	1,173.0	3,685.4	184.3	3869.6	2,696.7	438.3
2024		64.7	1,141.5	1,206.2	3,800.7	190.0	3990.8	2,784.5	393.5
2025		64.7	1,175.8	1,240.5	3,919.7	196.0	4115.7	2,875.2	353.3
2026		64.7	1,211.0	1,275.7	4,042.4	202.1	4244.5	2,968.8	317.3
2027		64.7	1,247.4	1,312.1	4,168.9	208.4	4377.3	3,065.3	284.8
2028		64.7	1,284.8	1,349.5	4,299.4	215.0	4514.4	3,164.9	255.7
2029		64.7	1,323.3	1,388.0	4,434.0	221.7	4655.7	3,267.6	229.6
2030		64.7	1,363.0	1,427.7	4,572.7	228.6	4801.4	3,373.6	206.1
2031		64.7	1,403.9	1,468.6	4,709.9	235.5	4945.4	3,476.8	184.7
2032		64.7	1,446.1	1,510.7	4,851.2	242.6	5093.8	3,583.0	165.5
2033		64.7	1,489.4	1,554.1	4,996.8	249.8	5246.6	3,692.5	148.3
2034		64.7	1,534.1	1,598.8	5,146.7	257.3	5404.0	3,805.2	132.9
2035		64.7	1,580.1	1,644.8	5,301.1	265.1	5566.1	3,921.3	119.1
2036		64.7	1,627.5	1,692.2	5,460.1	273.0	5733.1	4,040.8	106.7
2037		64.7	1,676.4	1,741.1	5,623.9	281.2	5905.1	4,164.0	95.6
2038		64.7	1,726.7	1,791.4	5,792.6	289.6	6082.2	4,290.9	85.7
2039		64.7	1,778.5	1,843.2	5,966.4	298.3	6264.7	4,421.5	76.8
2040		64.7	1,831.8	1,896.5	6,145.4	307.3	6452.6	4,556.1	68.8
2041	-3,781.0			-3,781.0				3,781.0	49.7
Total	54,349.8	1,867.1	35,377.6	91,594.5	117,304.0	5,865.2	123,169.2	35,115.8	-36,073.8

FIRR=	2.93%
NPV=	-29,522.8
B/C=	-1.859

Alternative 3: Cash Flow of Financial Analysis

(Million JPY in Financial Cost)

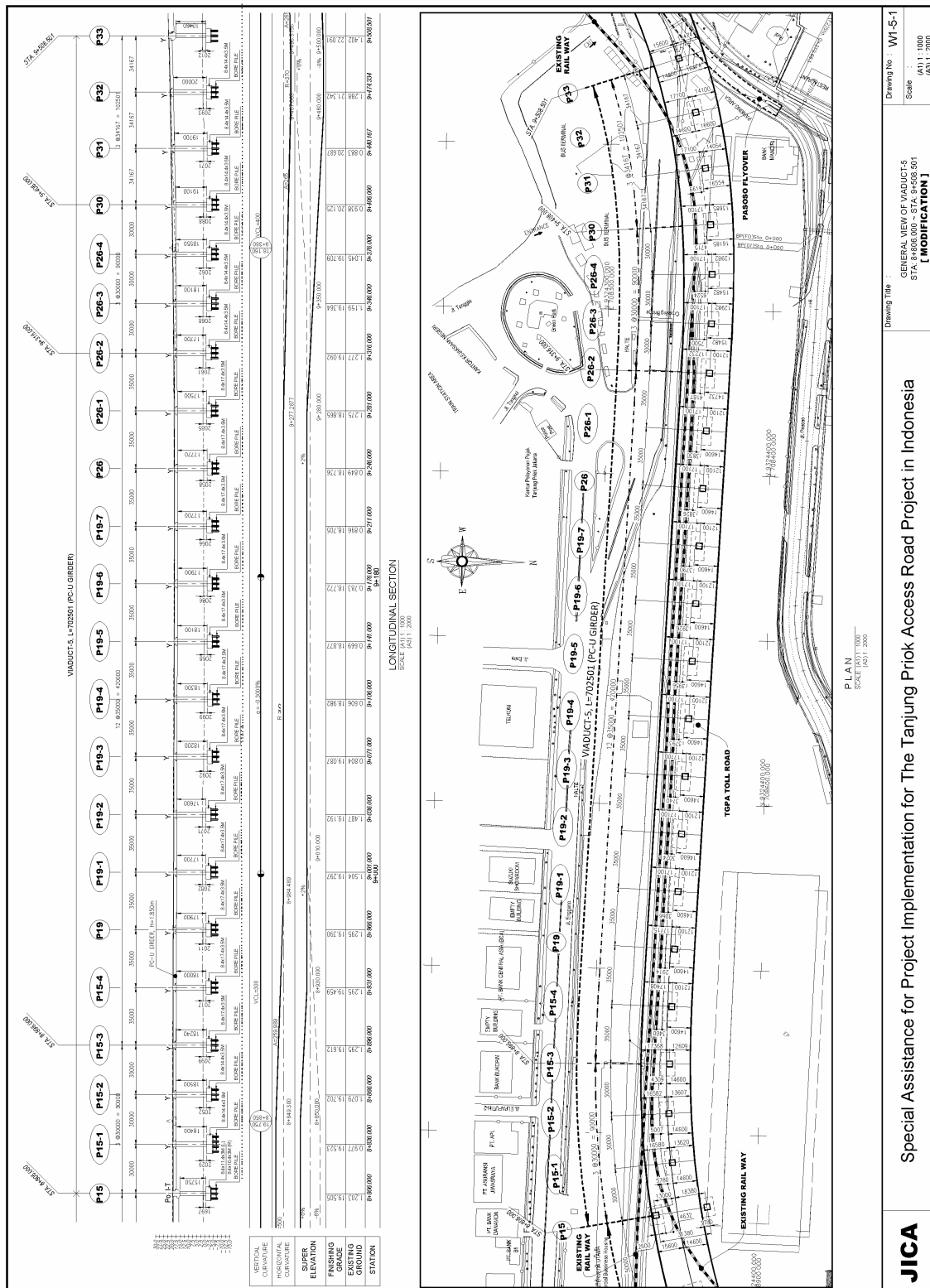
	Cost				Income			Cash Flow	
	Construction	Maintenance Cost	Operating Cost	Total	Revenue	Other Income	Total	Net Cash Flow	Discounted by 15%
2006	225.3			225.3				-225.3	-394.0
2007	901.2			901.2				-901.2	-1,370.5
2008	2,414.7			2,414.7				-2,414.7	-3,193.4
2009	6,982.7			6,982.7				-6,982.7	-8,030.1
2010	8,359.1	13.8	120.8	8,493.8	188.6	9.4	198.1	-8,295.7	-8,295.7
2011	19,564.2	27.7	181.2	19,773.1	377.3	18.9	396.1	-19,376.9	-16,849.5
2012	16,083.9	27.7	241.6	16,353.2	565.9	28.3	594.2	-15,758.9	-11,916.0
2013	20,732.3	55.7	302.0	21,090.1	943.2	47.2	990.4	-20,099.7	-13,215.9
2014	17,773.2	88.3	817.7	18,679.3	2,651.9	132.6	2784.5	-15,894.7	-9,087.9
2015	8,155.8	114.2	882.4	9,152.3	2,904.0	145.2	3049.2	-6,103.1	-3,034.3
2016		135.6	947.0	1,082.6	3,156.0	157.8	3313.8	2,231.2	964.6
2017		135.6	975.4	1,111.0	3,265.0	163.2	3428.2	2,317.2	871.1
2018		135.6	1,004.7	1,140.3	3,377.7	168.9	3546.6	2,406.3	786.6
2019		135.6	1,034.8	1,170.4	3,494.3	174.7	3669.0	2,498.6	710.3
2020		135.6	1,065.8	1,201.5	3,615.0	180.7	3795.7	2,594.2	641.3
2021		135.6	1,097.8	1,233.5	3,739.8	187.0	3926.8	2,693.3	578.9
2022		135.6	1,130.8	1,266.4	3,868.9	193.4	4062.3	2,795.9	522.6
2023		135.6	1,164.7	1,300.3	4,002.5	200.1	4202.6	2,902.3	471.7
2024		135.6	1,199.6	1,335.3	4,140.7	207.0	4347.7	3,012.4	425.7
2025		135.6	1,235.6	1,371.3	4,283.6	214.2	4497.8	3,126.5	384.2
2026		135.6	1,272.7	1,408.3	4,431.5	221.6	4653.1	3,244.8	346.8
2027		135.6	1,310.9	1,446.5	4,584.5	229.2	4813.7	3,367.2	312.9
2028		135.6	1,350.2	1,485.8	4,742.8	237.1	4979.9	3,494.1	282.3
2029		135.6	1,390.7	1,526.3	4,906.5	245.3	5151.9	3,625.5	254.7
2030		135.6	1,432.4	1,568.1	5,075.9	253.8	5329.7	3,761.7	229.8
2031		135.6	1,475.4	1,611.0	5,228.2	261.4	5489.6	3,878.6	206.1
2032		135.6	1,519.6	1,655.3	5,385.1	269.3	5654.3	3,999.0	184.8
2033		135.6	1,565.2	1,700.9	5,546.6	277.3	5823.9	4,123.1	165.6
2034		135.6	1,612.2	1,747.8	5,713.0	285.7	5998.7	4,250.8	148.5
2035		135.6	1,660.5	1,796.2	5,884.4	294.2	6178.6	4,382.4	133.1
2036		135.6	1,710.4	1,846.0	6,060.9	303.0	6364.0	4,518.0	119.3
2037		135.6	1,761.7	1,897.3	6,242.8	312.1	6554.9	4,657.6	107.0
2038		135.6	1,814.5	1,950.2	6,430.1	321.5	6751.6	4,801.4	95.9
2039		135.6	1,869.0	2,004.6	6,623.0	331.1	6954.1	4,949.5	86.0
2040		135.6	1,925.0	2,060.7	6,821.6	341.1	7162.7	5,102.0	77.1
2041	-10,549.0			-10,549.0				10,549.0	138.5
Total	90,643.3	3,718.6	37,072.3	131,434.2	128,251.3	6,412.6	134,663.9	6,770.8	-61,183.9

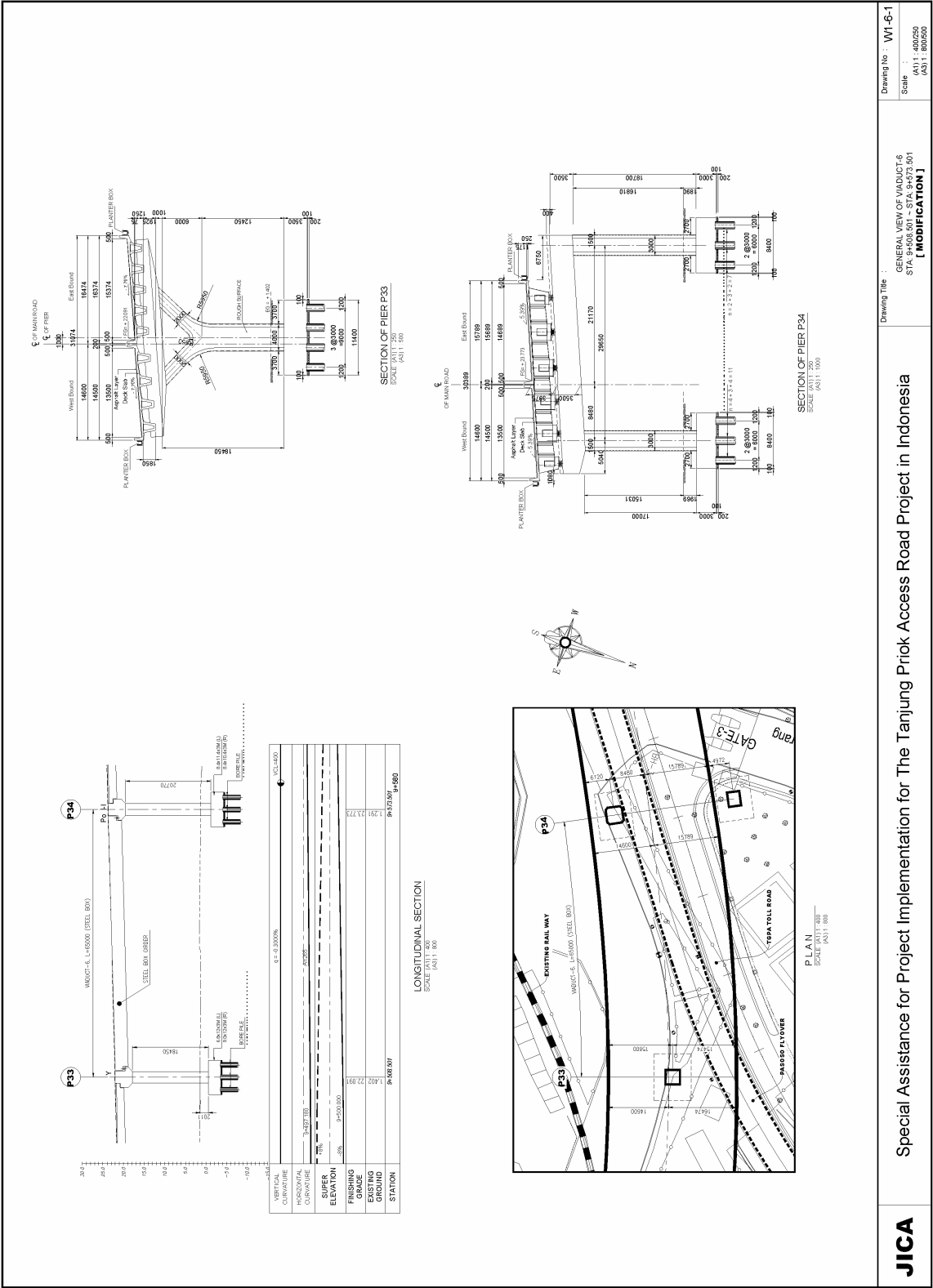
FIRR=	0.38%
NPV=	-41,324.7
B/C=	-2.968

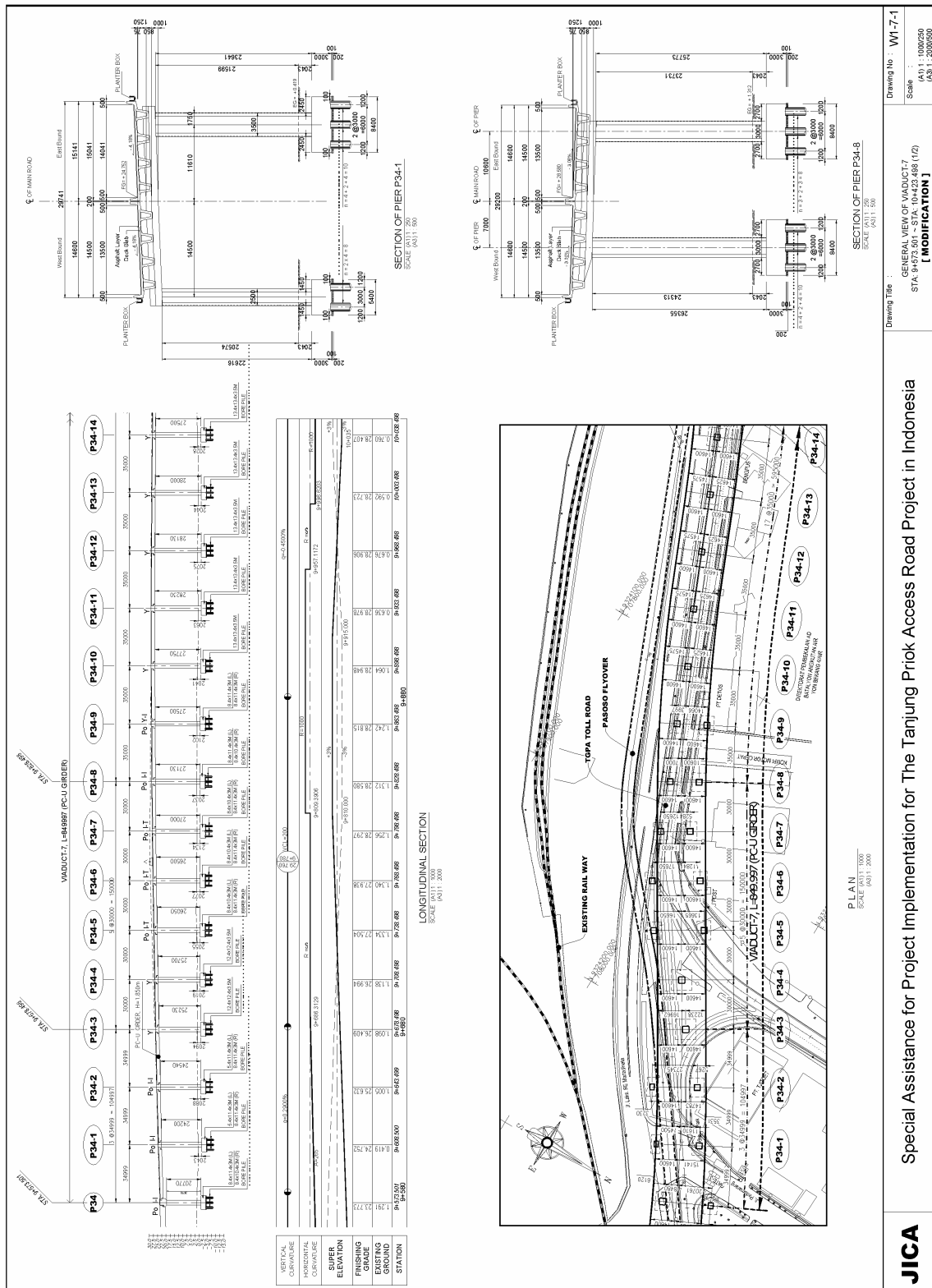
APPENDIX 4

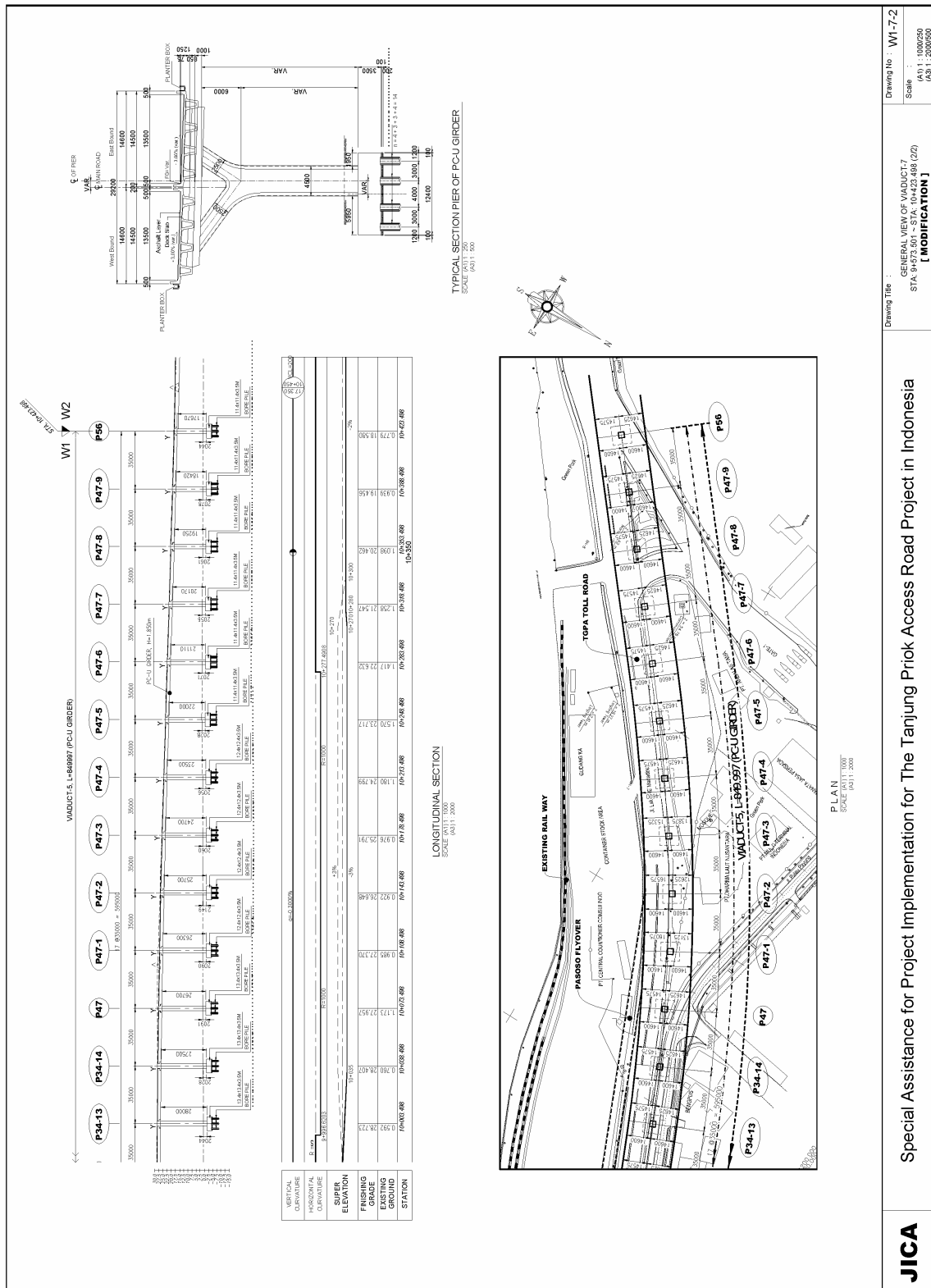
DRAWINGS OF ALTERNATIVE STRUCTURES

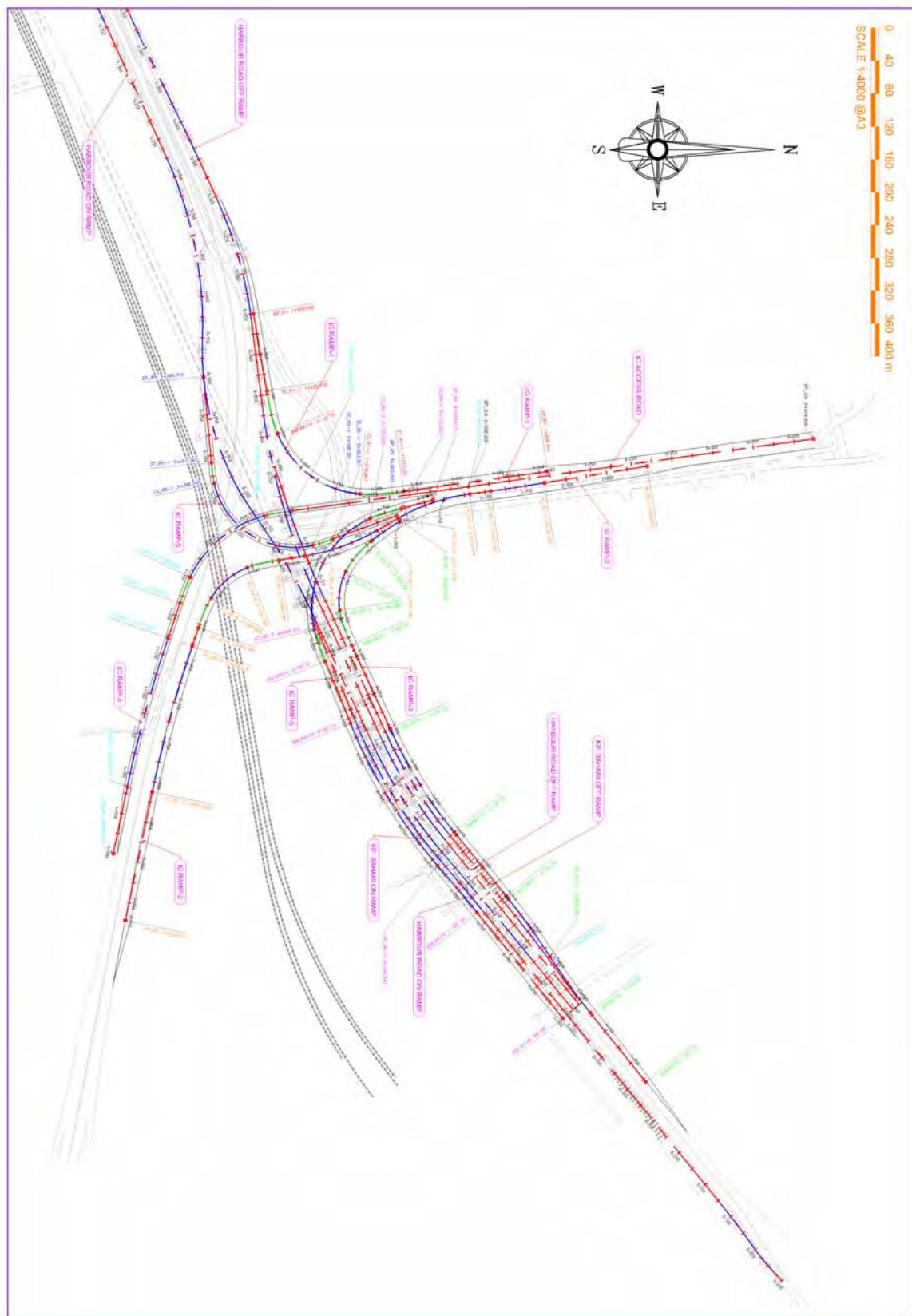




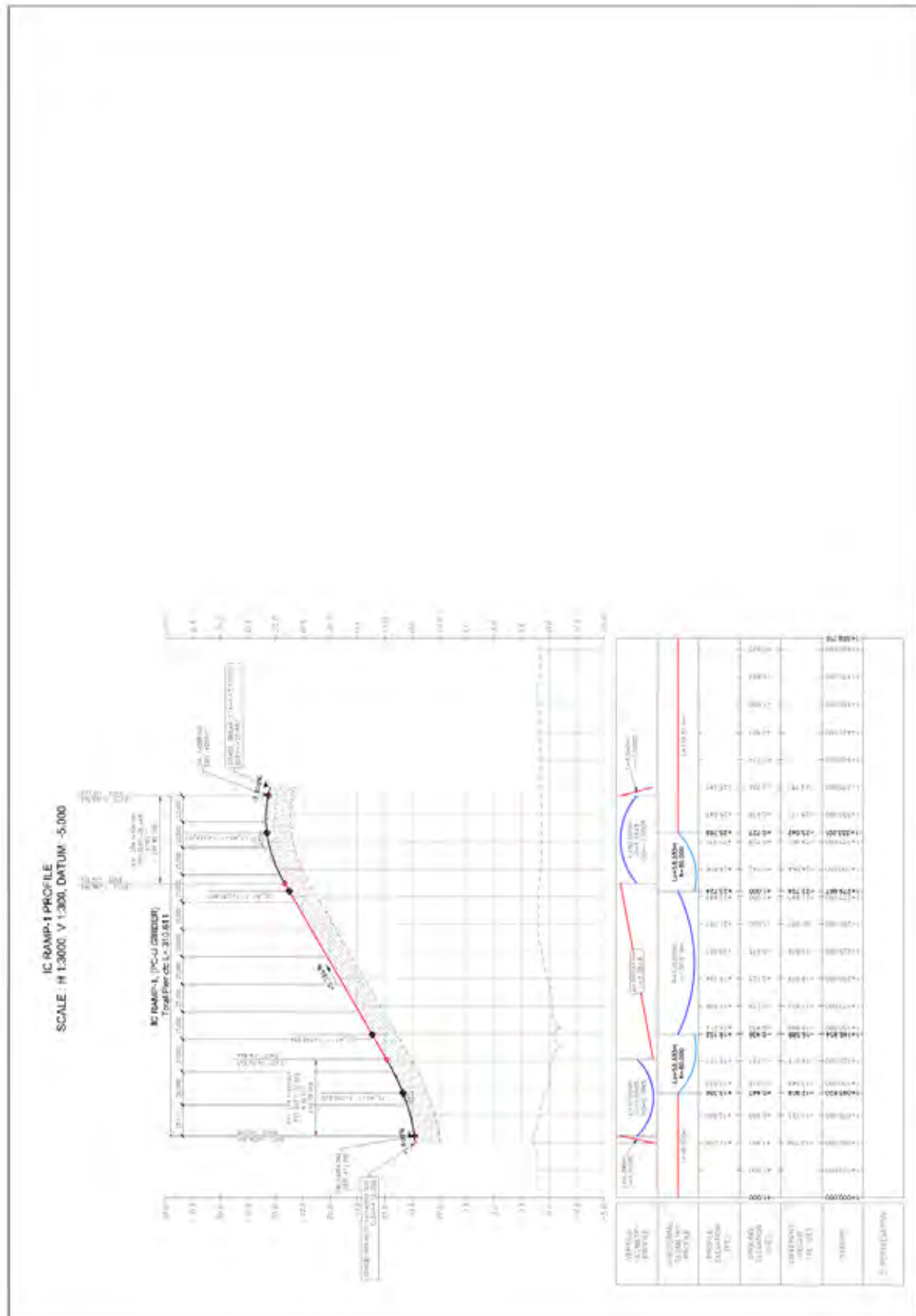


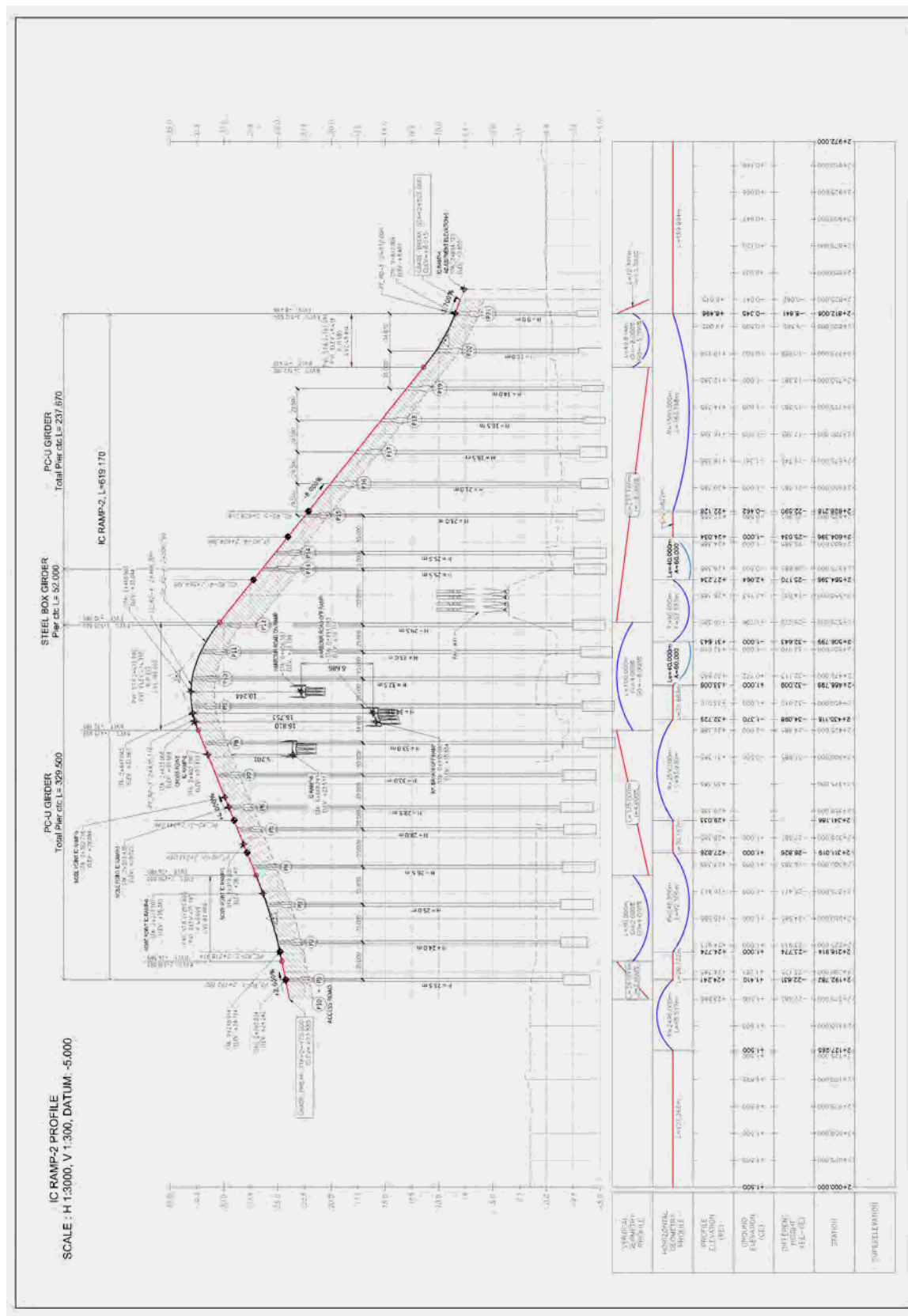


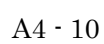


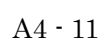


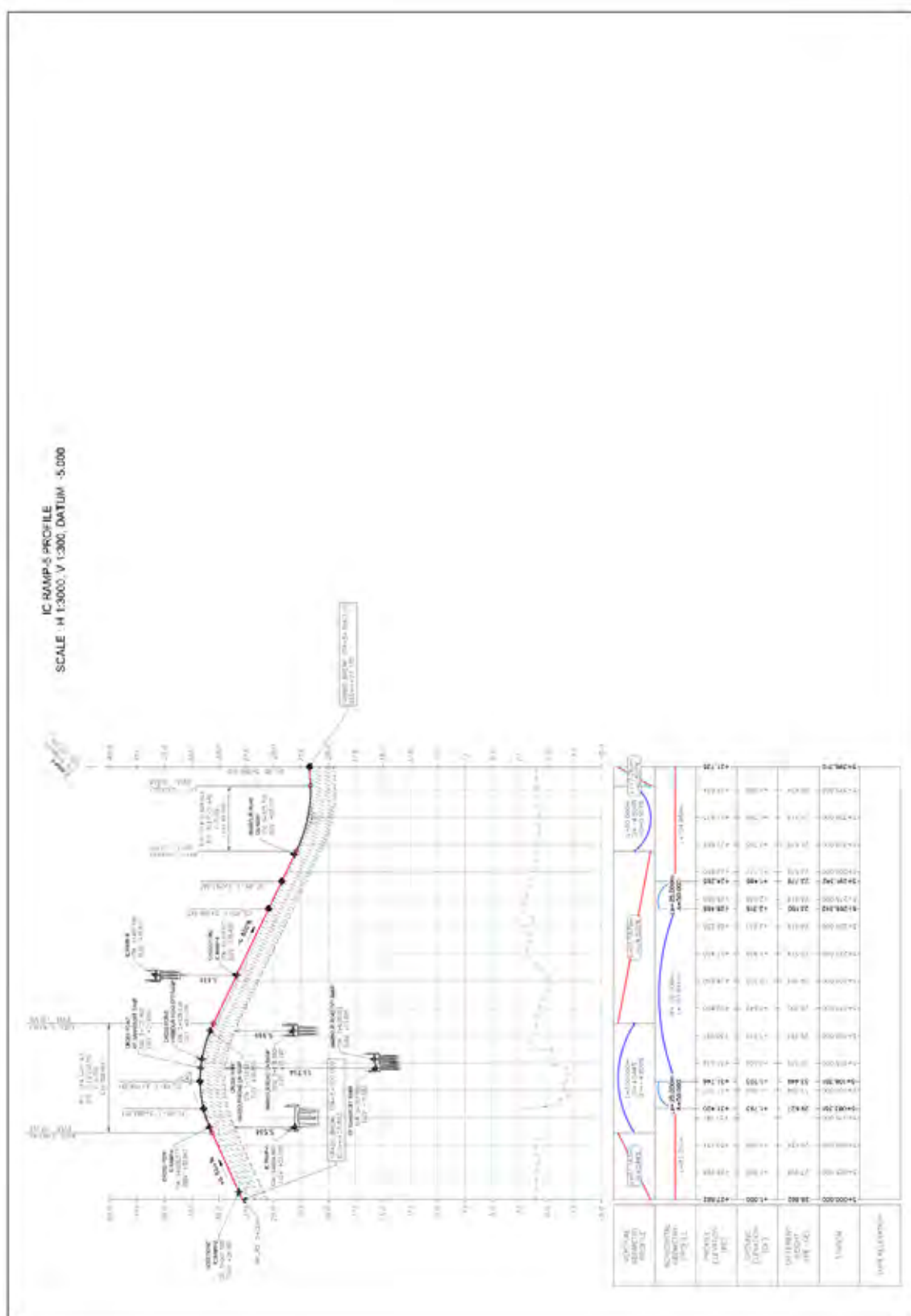


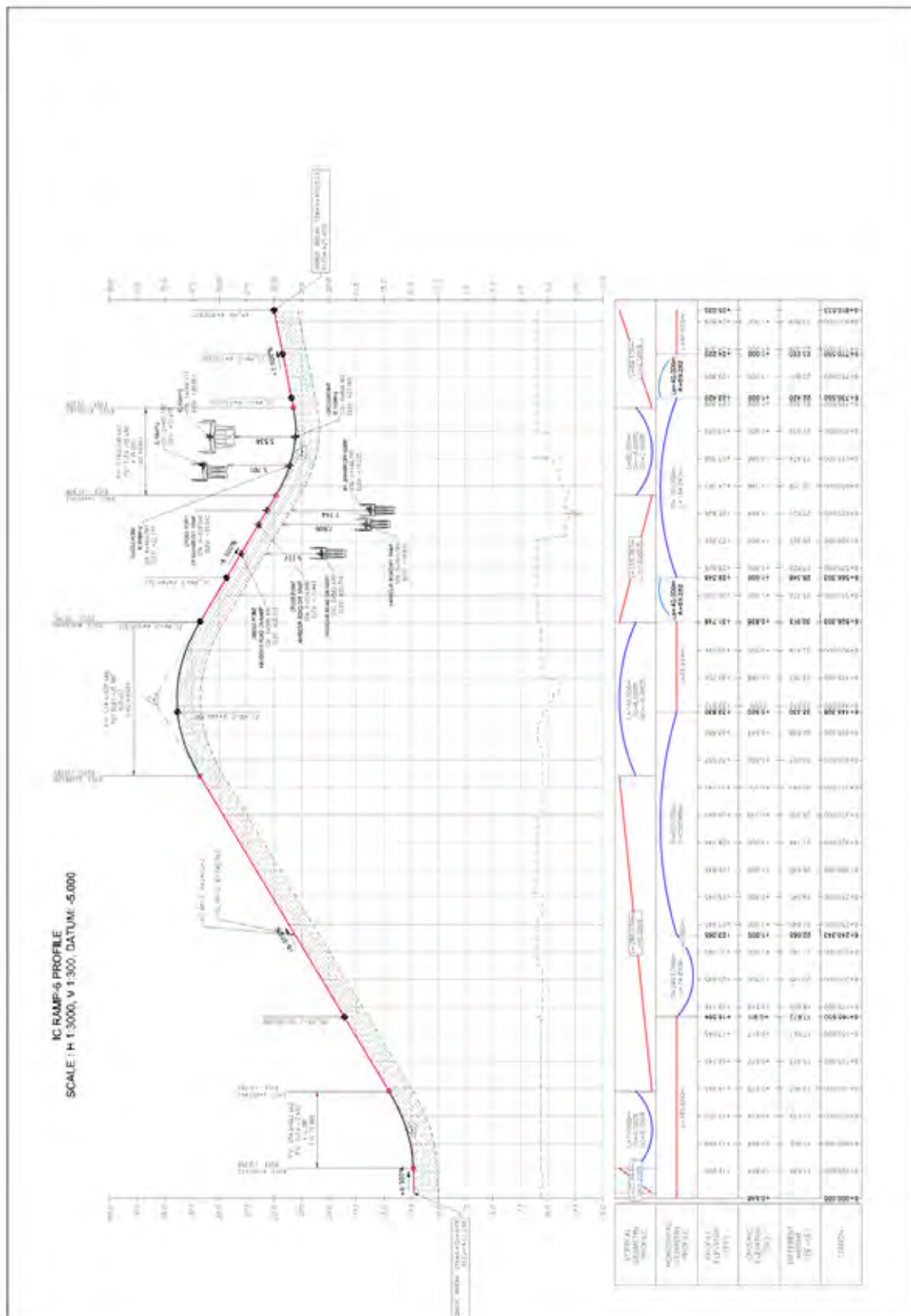


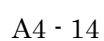


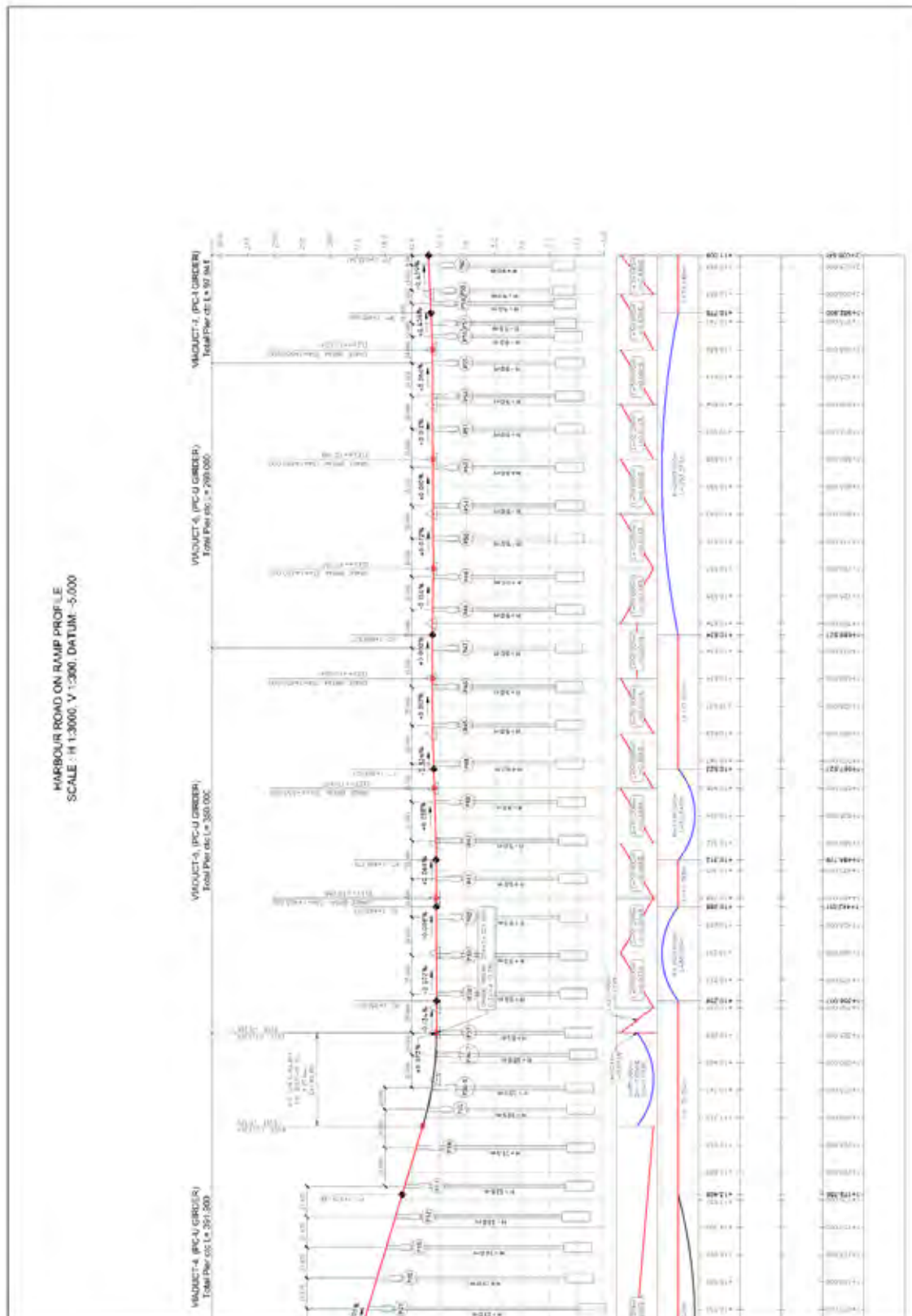


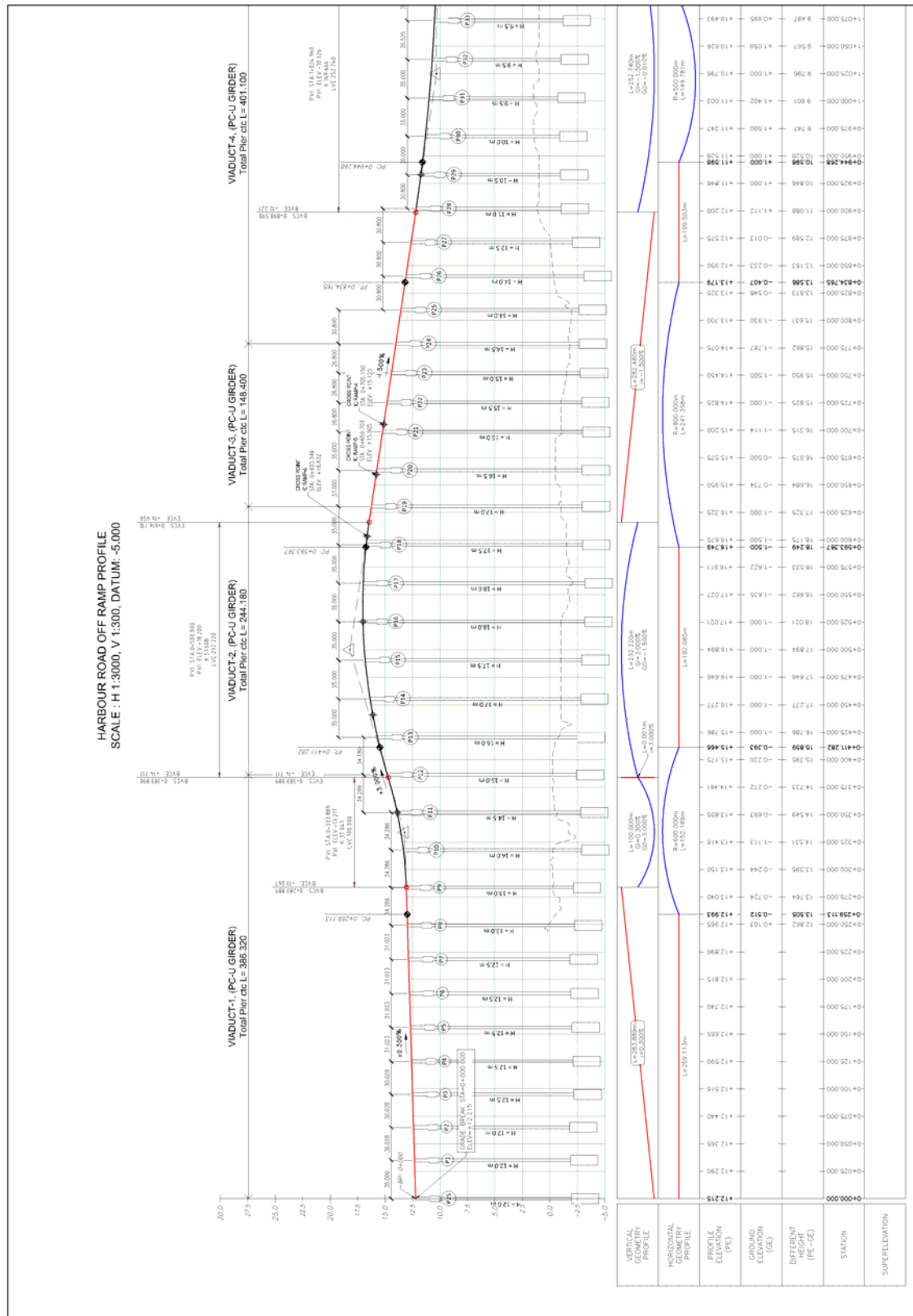


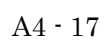


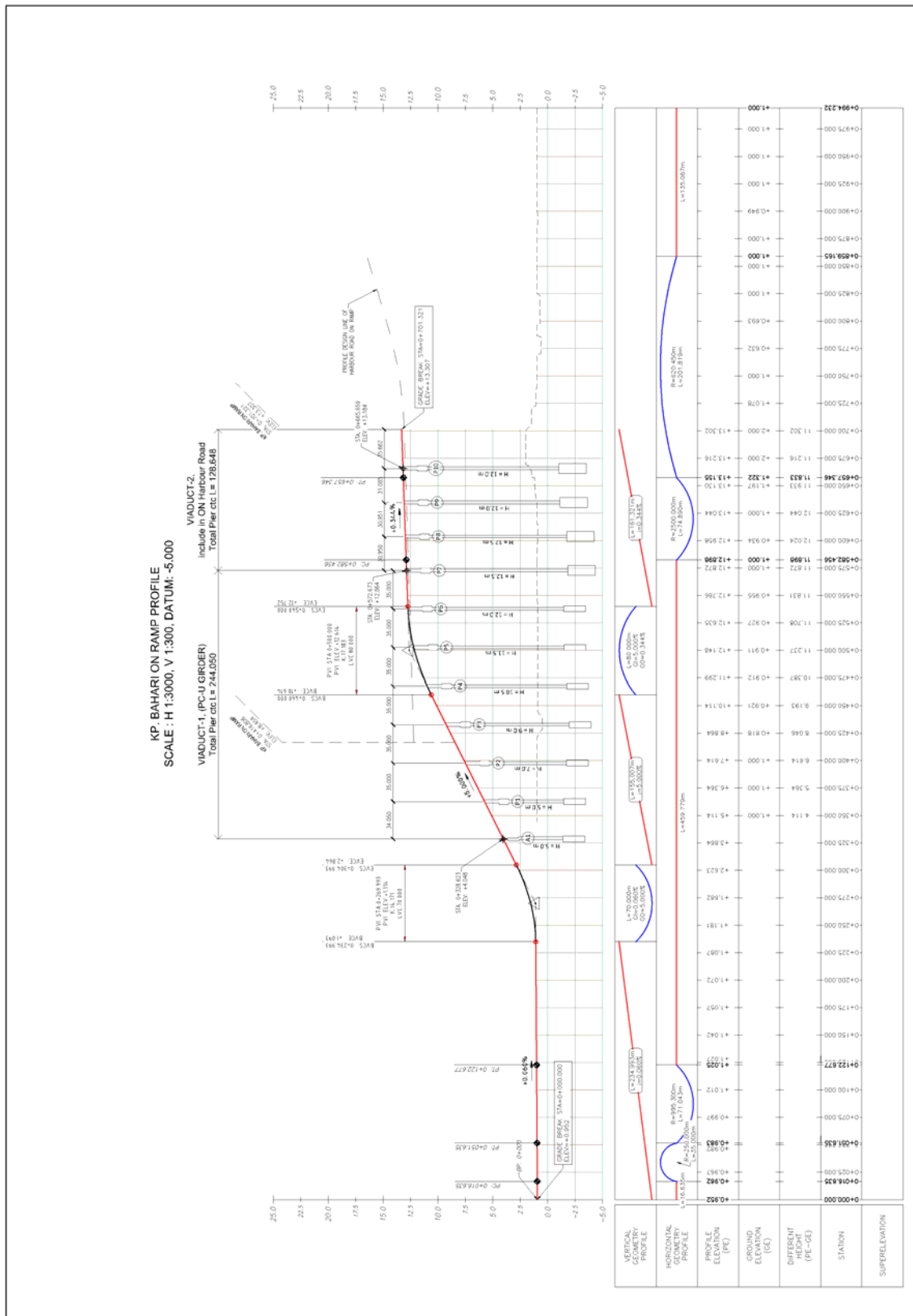


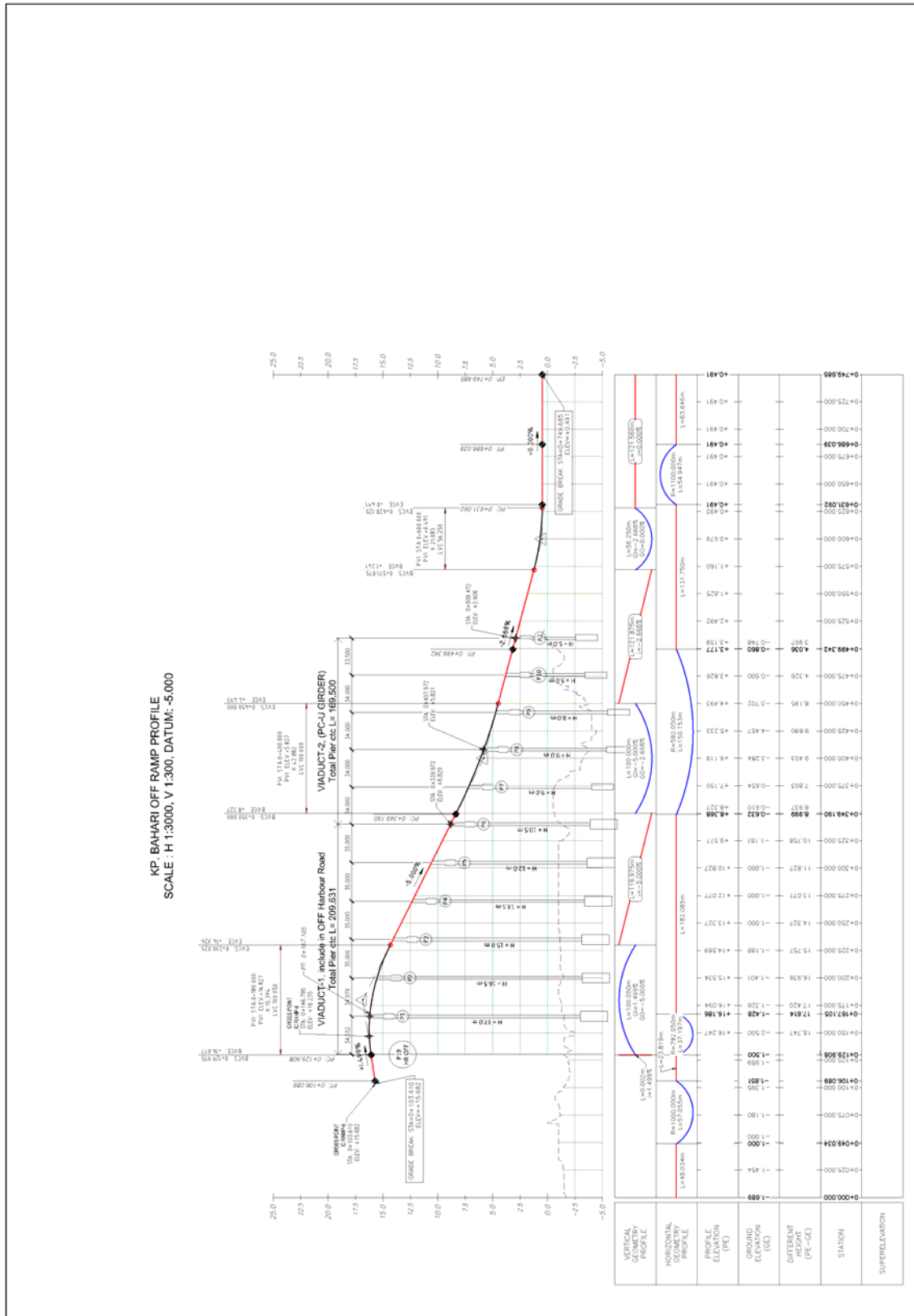


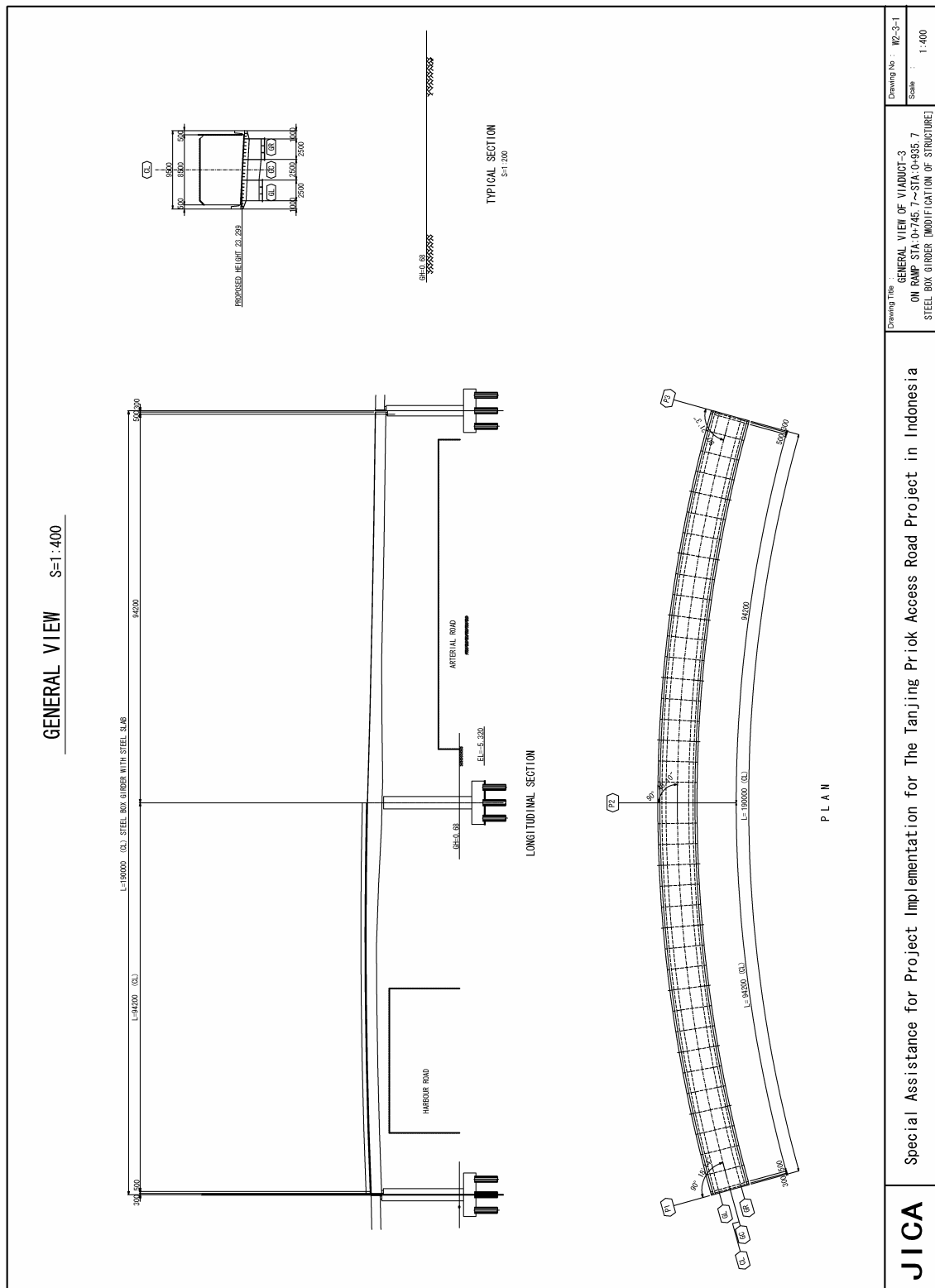












APPENDIX 5

DETAIL OF PROJECT COST ESTIMATE

Final Report

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

November 2010

Manning Schedule for the Consulting Services for Phase 3

44

Position		2010				2011				2012				2013				2014				2015				2016				Total								
Task Name		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
Pro-A																																						
Core Team																																						
A-	1 Team Leader																																				40	
A-	2 Supervision Engineer																																				29	
A-	3 Structure Engineer																																				32	
A-	4 Cable Stayed Bridge Specialist																																				23	
A-	5 Highway Engineer																																				31	
A-	6 Traffic Control Engineer																																				3	
A-	7 Cost Estimator																																				10	
A-	8 Document/Contract Specialist																																				38	
A-	9 Environmental Specialist																																				3	
																																		0				
Sub-Total of Pro-A		0				0				53				67				72				17				0				209								
Pro-B																																		0				
B-	1 Co-Team Leader																																				40	
B-	2 Superstructure Engineer 1																																				38	
B-	3 Substructure Engineer 1																																				37	
B-	4 Steel Structure Engineer																																				21	
B-	5 Foundation Engineer 1																																				16	
B-	6 Highway Engineer 1																																				38	
B-	7 Drainage Engineer 1																																				27	
B-	8 Traffic Engineer																																				27	
B-	9 Facility/Electric Engineer 1																																				27	
B-	10 Cost Estimator 1																																				36	
B-	11 Document/Contract Specialist 1																																				40	
B-	12 Environmental Specialist 1																																				40	
B-	13 Utility Engineer																																				30	
																																		0				
B-	14 Site Engineer																																				29	
B-	15 Quality Engineer																																				27	
B-	16 Quantity Engineer																																				0	
Sub-Total of Pro-B		0				0				88				189				183				30				0				490								
Assistant Engineer & Supporting Staff																																						
C-	1 Assistant Structure Engineer																																				39	
C-	2 Assistant Highway Engineer																																				38	
C-	3 Assistant Facility/Electric Engineer																																				38	
C-	4 Assistant Environmental Specialist																																				38	
C-	5 Assistant Utility Engineer																																				38	
C-	6 Office Manager																																				40	
C-	7 Assistant Office Manager																																				40	
C-	8 Computer Specialist 1																																				40	
C-	9 Computer Specialist 2																																				40	
C-	10 Secretary																																				40	
C-	11 Office Boy																																				40	
C-	12 Driver																																				240	
																																		0				
C-	13 Inspector 1																																				27	
C-	14 Inspector 2																																				27	
C-	15 Inspector 3																																				27	
C-	16 Inspector 4																																				27	
C-	17 Inspector 5																																				27	
C-	18 Inspector 6																																				27	
C-	19 Inspector 7																																				27	
C-	20 Inspector 8																																				27	
C-	21 Inspector 9																																				27	
C-	22 Inspector 10																																				27	
C-	23 Secretary																																				27	
C-	24 Office Boy																																				27	
Sub-Total of Assistant & Supporting Staff		0				0				187				319				319				83				0				908								
Grand Total		0				0				328				575				574				130				0				1607								

Breakdown for the Consulting Services Fee

USD 1 = 9017 IDR
 JPY 1 = 99.0099 IDR

	Unit	Qty	Foreign Portion (JPY)		Local Portion (IDR)		Total Amount
			Unit Rate	Amount	Unit Rate	Amount	JPY
1. Remuneration							
(1) Pro-A	M/M	209	2,400,000	501,600,000			501,600,000
(2) Pro-B	M/M	490			18,000,000	8,820,000,000	89,082,000
(3) Assistant & Supporting Staff	M/M	908			6,000,000	5,448,000,000	55,024,800
Sub-Total				501,600,000		14,268,000,000	645,706,800
2. Direct Cost							
(1) Office Rental & Furniture	Month	40			20,000,000	800,000,000	8,080,000
(2) Oversea Transportation	Trip	40	250,000	10,000,000			10,000,000
(3) Living Allowance	M/M	209			14,000,000	2,926,000,000	29,552,600
(4) Office Consumable	M/M	40			10,000,000	400,000,000	4,040,000
(5) Computer Supply	M/M	40			15,000,000	600,000,000	6,060,000
(6) Communication	M/M	40			4,000,000	160,000,000	1,616,000
(7) Computer Rental	M/M	1398			500,000	699,000,000	7,059,900
(8) Computer Software	M/M	1398			500,000	699,000,000	7,059,900
(9) Vehicle & Others	M/M	240			10,000,000	2,400,000,000	24,240,000
Sub-Total				10,000,000		8,684,000,000	97,708,400
Total				511,600,000		22,952,000,000	743,415,200

Disbursement Schedule for Phase 3

Base Year for Cost Estimation August 2010
USD 1 = 9,017 IDR
Exchange Rate
Price Escalation
Physical Contingency for Construction
Physical Contingency for Construction
Interest During Construction
Construction Charge

	Contract Amount		Annual Disbursement												Total	
	FC (1000 Rp)	L/C (1000 Rp)	FC (1000 Rp)	L/C (1000 Rp)	FC (1000 Rp)	L/C (1000 Rp)	FC (1000 Rp)	L/C (1000 Rp)	FC (1000 Rp)	L/C (1000 Rp)	FC (1000 Rp)	L/C (1000 Rp)	FC (1000 Rp)	L/C (1000 Rp)	FC (1000 Rp)	L/C (1000 Rp)
1. Construction																
Construction Fee (Base Cost)	511,400	22,912	511,400	22,912	511,400	22,912	511,400	22,912	511,400	22,912	511,400	22,912	511,400	22,912	511,400	22,912
Construction Fee (Price Escalation)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction Fee (Physical Contingency)	51,140	2,291	51,140	2,291	51,140	2,291	51,140	2,291	51,140	2,291	51,140	2,291	51,140	2,291	51,140	2,291
Construction Fee (Total)	562,540	25,203	562,540	25,203	562,540	25,203	562,540	25,203	562,540	25,203	562,540	25,203	562,540	25,203	562,540	25,203
Interest during construction																
Construction Charge																
2. Construction																
(2) Phase 3																
Construction Cost	2,231,348	313,463	2,231,348	313,463	2,231,348	313,463	2,231,348	313,463	2,231,348	313,463	2,231,348	313,463	2,231,348	313,463	2,231,348	313,463
Construction Cost (Price Escalation)	144,299	16,037	144,299	16,037	144,299	16,037	144,299	16,037	144,299	16,037	144,299	16,037	144,299	16,037	144,299	16,037
Construction Cost (Physical Contingency)	111,157	12,391	111,157	12,391	111,157	12,391	111,157	12,391	111,157	12,391	111,157	12,391	111,157	12,391	111,157	12,391
Construction Cost (Total)	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891
Interest during construction																
Construction Charge																
Total of Construction	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891	2,486,804	341,891
Total																
Construction = Construction Cost (Total)	3,011,976	727,412	3,011,976	727,412	3,011,976	727,412	3,011,976	727,412	3,011,976	727,412	3,011,976	727,412	3,011,976	727,412	3,011,976	727,412
Interest during construction																
Construction Charge																

Annual fund Requirement for Phase 3													
Base Year for Cost Estimation August 2010 USD 1 = 9,017 IDR Exchange Rate JPY 1 = 99.01 IDR Price Escalation F/C = 1.8 % L/C = 7.9 % Physical Contingency for Construction 5 % Physical Contingency for Construction 10 % Administration Cost 5 % Tax 10 % Interest During Construction 0.01 % Construction 0.20 % (STEP) Construction Charge 0.1 %													
Item	Total		2011		2012		2013		2014		2015		Total
	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	Total
(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)	(1000 JPY)
A. Eligible Period													
1) Procurement / Construction	2,408,316	702,292	2,408,316	702,292	2,408,316	702,292	2,408,316	702,292	2,408,316	702,292	2,408,316	702,292	2,408,316
State Cost	1,311,348	513,493	1,311,348	513,493	1,311,348	513,493	1,311,348	513,493	1,311,348	513,493	1,311,348	513,493	1,311,348
Price Escalation	146,569	160,937	1,771,563	0	3,002	1,196	54,022	54,022	73,154	61,433	86,579	14,421	17,663
Physical Contingency	111,987	29,923	371,892	0	4,112	933	49,568	49,568	11,453	18,353	16,513	8,244	1,809
2) Operating Expenses	942,760	25,247	942,760	25,247	942,760	25,247	942,760	25,247	942,760	25,247	942,760	25,247	942,760
State Cost	311,600	22,972	311,600	22,972	311,600	22,972	311,600	22,972	311,600	22,972	311,600	22,972	311,600
Price Escalation													
Physical Contingency	31,160	2,297	74,342	0	13,874	331	16,106	16,106	17,624	791	25,116	4,141	191
3) Interest During Construction	9,767	2,453	36,913	0	97	334	1,299	1,299	3,313	969	1,349	1,349	18,469
4) Construction Charge	8,175	2,345	31,798	0	2,816	713	10,136	10,136	7,462	898	2,223	3,163	40
A. TOTAL (A = B + C + D + E + F)	3,070,916	702,340	10,467,935	3,072	25,316	39,761	1,279,703	1,279,703	1,312,037	331,799	4,664,017	259,704	61,233
B. Non Eligible Period													
a) Land Acquisition	125,645	1,248,816		61,823	624,408								
b) Administration Cost	132,399	36,373	519,842	0	11,654	1,411	26,352	26,352	43,811	15,199	212,142	41,428	232,377
c) VAT	303,168	72,751	1,019,924	0	33,246	2,403	127,622	127,622	130,312	33,060	464,724	23,421	1,653
d) Interest Tax													
B. TOTAL (A = b + c + d)	457,396	252,763	2,808,702	61,823	624,408	34,873	197,434	197,434	194,778	48,389	697,131	30,112	8,978
GRAND TOTAL (A + B)	3,528,312	955,103	13,276,637	3,072	27,940	274,634	1,477,137	1,477,137	1,506,815	380,188	5,361,148	279,816	70,210

Alternative design for Cable Stayed Bridge

Comparative Study of Superstructure Type

Evaluation Items	Max. Point	Alternative-1 Steel Box Girder with Steel Slab	Alternative-2 Steel Truss with RC Slab
Side View			
Structural Aspect and Stability	15	<ul style="list-style-type: none"> • Economical span length of this girder type is from 40m to 150m. • Depth of girder is shorter than Steel Truss. • This type of superstructure is structurally stabilized for curved alignment. • Dead load is light weight compare with Steel Truss in order to adopt steel slab. • The shape of substructure can be minimized due to light weight. 	<ul style="list-style-type: none"> • Economical span length of this girder type is from 60m to 120m. • Depth of girder is higher than Steel Box. • Short depth is required since Ancol IC will cross over this bridge. • This type of superstructure is not very good for curved alignment.
Construction Plan and Period	15	<ul style="list-style-type: none"> • Superstructure is erected by staging method. • Safety facilities are required especially above the Harbor Toll and arterial road. • Construction period is 15 months 	<ul style="list-style-type: none"> • Superstructure is erected by staging method. • Safety facilities are required especially above the Harbor Toll and arterial road. • Construction period is 17 months
Maintenance	20	<ul style="list-style-type: none"> • Regular maintenance (re-painting) is necessary for exposed steel members at 10 - 20 years intervals 	<ul style="list-style-type: none"> • Regular maintenance (re-painting) is necessary for exposed steel members at 10 - 20 years intervals
Construction Cost	40	<ul style="list-style-type: none"> • Construction Cost : Rp. 72,885 Mill. 	<ul style="list-style-type: none"> • Construction Cost : Rp. 75,612 Mill.
New Technology	5	<ul style="list-style-type: none"> • Common Technology 	<ul style="list-style-type: none"> • Common Technology
Environmental Impact and Traffic Management/ROW	5	<ul style="list-style-type: none"> • No major environmental impact • Traffic management for Harbor Road is required. 	<ul style="list-style-type: none"> • No major environmental impact • Traffic management for Harbor Road is required.
Evaluation	100	<ul style="list-style-type: none"> • This type is economically and structurally recommended. 	<ul style="list-style-type: none"> • Construction Cost is higher than the other alternative.
		Recommendable	Less Recommendable

