5.5 MEASURES TO ENSURE VIABILITY

5.5.1 Preliminary Viability Analysis

(1) Step of Analysis

The Study team conducted a preliminary viability analysis based on the results of SITRAMP. The following steps have been taken for the analysis:

- Arrangement of preconditions for toll road construction;
- Viability analysis based on simplified model case; and
- Measures to be taken to induce future traffic demand for the toll road.

1) Preconditions

The following are the preconditions to analyze the viability for the toll road in the Study.

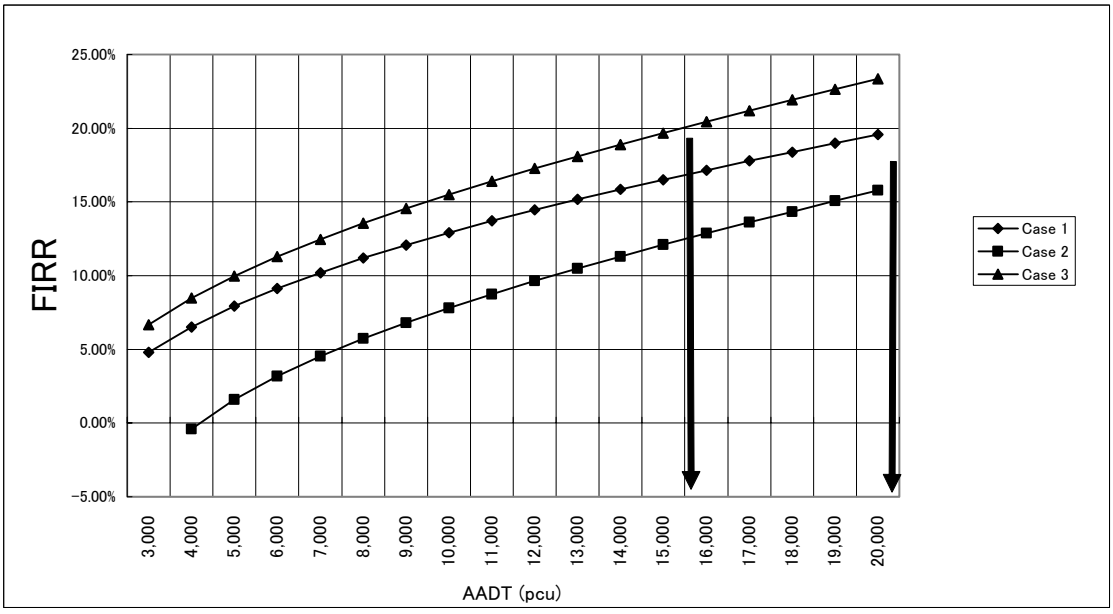
Table 5.5.1 Basic Preconditions for Viability Analysis

Items	Conditions	Remarks
Length	1 km as a unit length	
Unit toll rate	Rp. 450 /km and 20% up every 3 years	Jasa Marga has already filed a request.
Unit of traffic volume	P.C. U.	
Traffic growth	5 percent per year	
Price	Constant price in 2003 year	
Land cost	Rp. 8.0 billion /km	Borne by investor or the central government
Project cost	Rp. 33.29 billion / km for 6 lanes*	Including land cost, contingency and others.
Operation and Maintenance cost	Rp. 0.37 billion / km and 5% up every year	Referring to Phase 1 study on JORR
Service year	Toll is open to public in 2004	
Duration for analysis	30 years	
Capital	All costs are covered by toll revenue	No capital fund is assumed.

Note: *) the cost is assumed based on that of between Jagorawi Toll Road and Cikampek Toll Road.

2) Viability Analysis

A key issue is how much traffic volume is required to meet toll business under certain conditions. Based on the preconditions mentioned in the previous section, the viability was roughly analyzed (refer to Figure 5.5.1). Under the assumption that the toll road is opened to the public in 2004, around 20,000 pcu are at least required to ensure viability as initial traffic volume in 2004.



Note: Case 1: All costs are covered by investors.
Case 2: No toll raising
Case 3: Land costs are appropriated by the central government.

Figure 5.5.1 Preliminary Viability Analysis

(2) Preliminary Evaluation

According to the viability analysis, a preliminary evaluation from a viewpoint of toll business is performed and results are given in the following table.

Table 5.5.2 Preliminary Evaluation

Major Stretches		Evaluation
From	To	
Cengkareng Access (west route)	Daan Mogot	Estimated traffic volume is far lower than that required for toll business and any area development cannot enhance viability.
Daan Moggot	Merak Toll road	Traffic volume is not sufficient, however, combination with consecutive sections may make the stretch viable since the distance of the section is short.
Merak Toll road	Serpong Toll road	Traffic volume may be an edge for viability.
Serpong Toll road	Cinangka Raya	These stretches have enough traffic volume to make toll road business viable.
Cinangka Raya	Jagorawi Toll road	
Jagorawi Toll road	Cikampek Toll road	This stretch is obviously short on traffic volume to make toll business viable and some measures to increase traffic are required.
Cikampek Toll road	East Section of JORR	Estimated traffic volume is much lower than that required for toll road operation and area developments cannot make it viable, though some high traffic volume can be observed near the east section of JORR.

The evaluation leads to the following preliminary conclusions:

- The west side route between Cengkareng Access Road and Jl. Daan Mogot has little possibility for toll business even if a large-scale area development is taken into consideration.

- The stretch between Jl. Daan Moggot and Jl. Cinangka Raya seems difficult to make toll business viable independently. However, viability may be augmented if the section is combined with the stretch between Jl. Cinangka Raya and Jagorawi Toll Road, on which much traffic volume is anticipated.

- The stretch between Cinangka Raya and Jagorawi Toll Road is likely to have sufficient traffic demand to make toll business feasible independently.

- The stretch between Jagorawi and Cikampek Toll Roads has not enough traffic volume. In addition, even under the condition of combination with other stretches like between Jl. Cinangka Raya and Jagorawi Toll Road, total viability may not be maintained. From these facts, integration between the large-scale area development and toll road development is recommended in order to enhance viability of toll road investment, or the combination with the other stretches having higher traffic volume may also be required.

(3) Measures to Ensure Viability of the Project

1) Integration between Area Development and Toll Road Development

Simply speaking, there are two methods to ensure viability of the toll road project as follows:

- to increase traffic volume; and

- to reduce project cost.

The only way to satisfy these two methods at the same time is to take advantage of large-scale estate development, by which additional traffic volume would be generated and part of land for the toll road could be furnished through integration of area development and toll road development. The stretch between Cikampek Toll Road and Jagorawi Toll Road is anticipated to have insufficient traffic volume to operate a toll road business because the area along this stretch has not been aggressively developed for a long time except agglomeration of industrial factories along Jl. Siliwangi and the rather large-scale industrial estate along Cikampek Toll Road. As 2nd JORR is a ring road, missing the stretch between Cikampek and Jagorawi Toll Roads becomes a fatal drawback as a distributor and sub-center development scenario would not be encouraged by transportation system development.

In this context, integration between large-scale area development and toll road development is the single most important measure to materialize 2nd JORR.

2) Direction and Policy on Regional Development

A policy on regional development in Jabodetabek can be summarized as follows:

- Restriction on area development in the southern region in Jabodetabek in order to prevent the central area of Jakarta from serious flood and degradation of drinking water;
- To promote sub-center development scenario; and
- To accelerate east-west corridor development instead of southern area development.

Considering the development policy in Jabodetabek, it can be said that the large-scale area development between Cikampek Toll Road and Jagorawi Toll Road is to meet the development strategy.

There are several large-scale housing estates such as Bintaro Jaya and BSD (Bumi Serpong Damai). BSD is expected to be further extended toward the west up to near Tigaraksa targeting eventual 600,000 residents in the future. On the other hand, there is not such a large new-town or housing estate except industrial estates in the eastern region in Jabodetabek. For the future development perspective, a well-balanced area development is required between the east and west from a viewpoint of efficient and harmonious development. Distorted development may cause excessive investment on transportation and other infrastructure facilities.

(4) Characteristics of Required Area Development

1) Concept of Area Development

Preliminary analysis reveals that around 8% of utilization ratio of toll road can be expected out of trips generated from the zones along 2nd JORR. Area development near interchanges will increase the ratio to divert to the toll road by around 15% due to short and easy accessibility. Another analysis estimates that some 65,000 trip-ends are required to increase 2nd JORR traffic by 10,000 pcu.

2) Components of Area Development

Considering characteristics of areas along the road and existing transportation facilities, the major development component should be housing estates. It is, however, necessary to contain business and commercial functions with a view to avoiding additional burden to the CBD of DKI Jakarta in terms of commuting trips. This also meets with the regional development scenario to promote sub-centers in the east of Jabodetabek.

3) Framework of Area Development

Figure 5.5.2 shows the relationship between the number of residents, the number of jobs and trip production and attraction in pcu basis. According to the relationship, the following residents and jobs are required to obtain around 65,000 trip-ends in pcu from the assumed area development.

Table 5.5.3 Framework of Assumed Area Development

Item	Development Framework
Residents	220,000
Jobs	40,000

It is, however, better to divide this framework into two places near planned interchanges on 2nd JORR with a view to increasing accessibility to the interchanges and from an easy implementation management viewpoint. In this context, the following area development is proposed.

Table 5.5.4 Actual Development in Place

Place	Residents	Job Opportunity
Near Siliwangi Interchange	110,000	20,000
Near Setu Interchange	110,000	20,000

4) Layout Plan

Preliminary layout plan is shown in Figures 5.5.3. Although this layout itself may change according to progress of further study, the important thing is to take advantage of short and easy accessibility to the interchange of 2nd JORR. In addition, the area development is expected to furnish part of land for 2nd JORR with a view to ensuring viability.

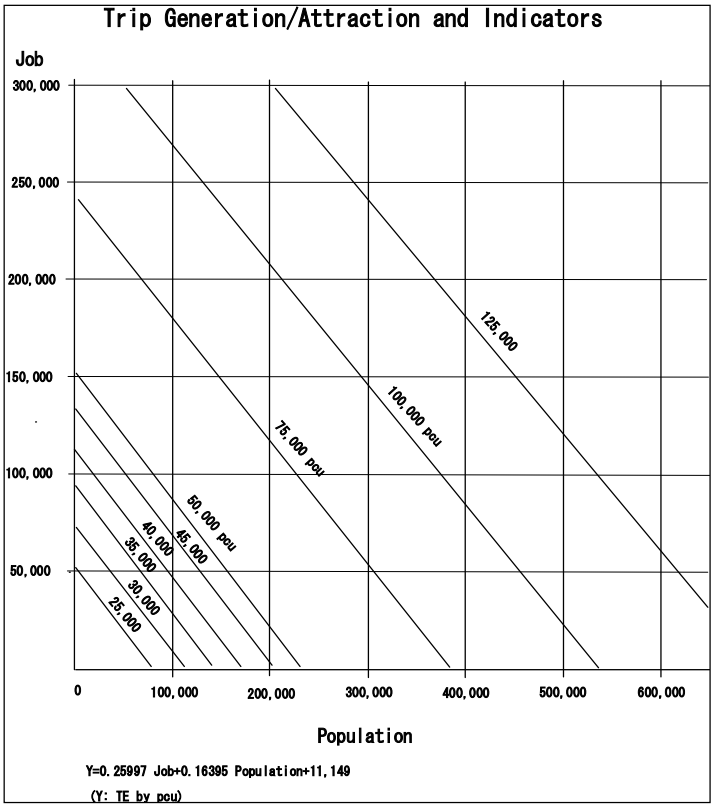


Figure 5.5.2 Relationship between Framework and Trip-Ends

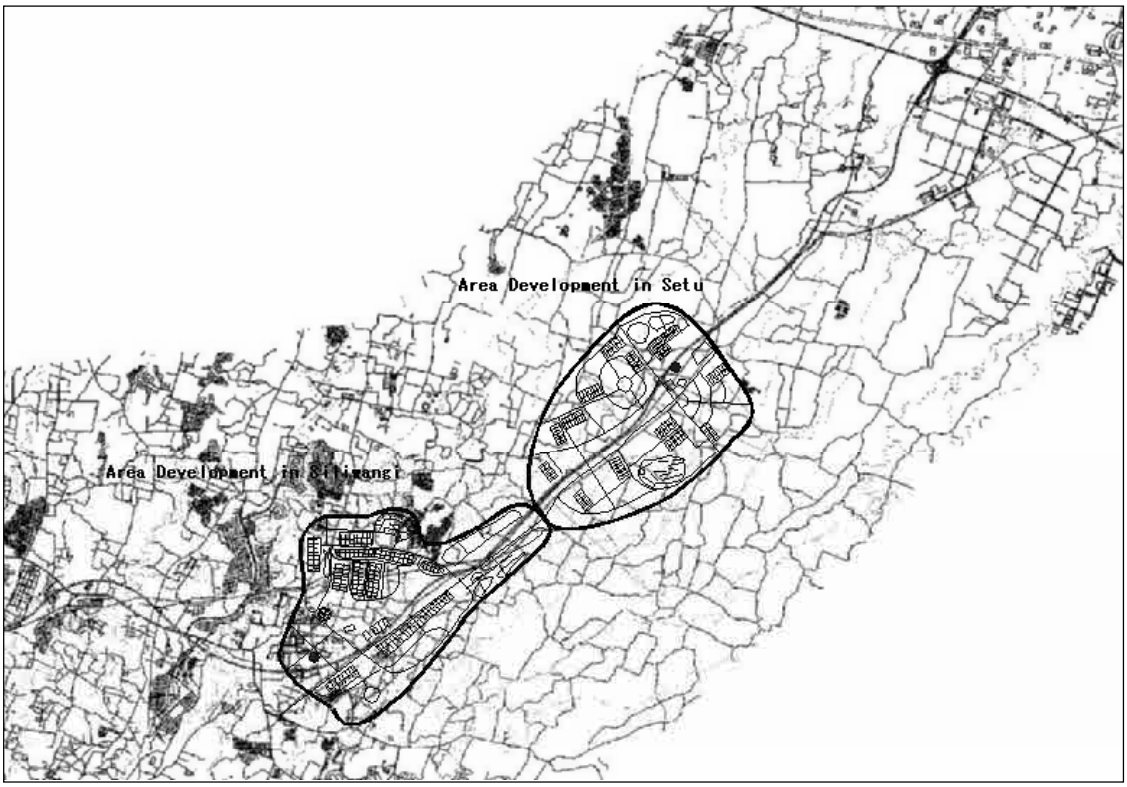


Figure 5.5.3 Layout Plan of Area Development (between Siliwangi and Setu IC)

(5) Expected Development Benefits

1) Current Land Price Distribution

Toll road development usually greatly impacts on land price due to increase of accessibility to the land, especially near interchanges. SITRAMP has carried out land value survey, which contains the highest and lowest market land value in the urbanized area of the Jabodetabek region. Two kinds of land-price brackets, those of near interchanges and far from interchanges, were extracted from the results of the land value survey for the impact analysis. The outline of extracted land values is shown in Table 5.5.5.

Table 5.5.5 Land Values at Selected Locations in Jabodetabek

Unit: Price is 1000 Rp./m2

Area	Near Interchange				Far from Interchange			
	Samples	Highest Price	Lowest Price	Ratio (H/L)	Samples	Highest Price	Lowest Price	Ratio (H/L)
Kab. Tangerang	5	1420	149	9.0	6	364	76	5.3
Depok	1	1500	125	12.0	16	719	191	3.7
Kota Bekasi	4	1875	425	4.2	8	413	126	3.2
Kab. Bogor	4	398	72.5	7.3	5	460	92	5.8
DKI Jakarta	6	1408	366.7	3.9	0	-	-	-
Average	20	1307	253.0	6.3	35	546	139	4.2

The land values near interchanges in the highest and lowest are both dominant in comparison to those of far from interchanges. In addition, the average ratio of the highest prices to the lowest near interchanges is also higher than that of far from interchanges.

Figures 5.5.4 and 5.5.5 show the comparison between the highest and the lowest land values, and the ratio of the highest to the lowest land values. According to the figures, the following features can be observed.

a. Group H1

This group belongs to the areas along Jagorawi Toll Road in Kab. Bogor. Low development and scattered urbanization can be observed. The big differences between the highest and lowest prices come from gaps between developed and undeveloped situations.

b. Group H2.

This group is located in already developed area such as DKI Jakarta and Kota Bekasi. Land values are rather high and no big differences between the highest and lowest prices can be seen due to maturity of the area.

c. Group H3

This is in BSD (Bumi Serpong Damai) area, which has been developed as a large-scale housing estate. However, undeveloped districts still remain around BSD estate. This resulted in big gaps between the highest and lowest prices.

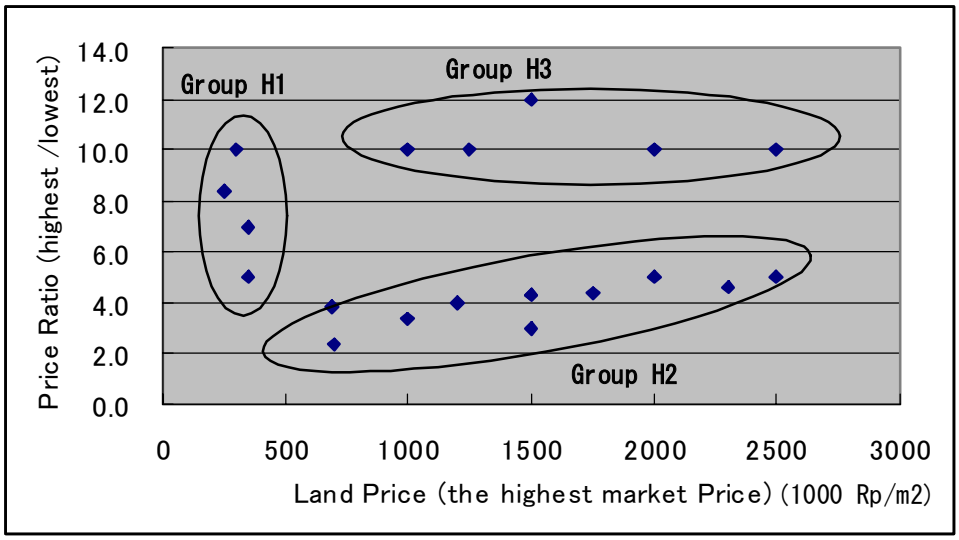


Figure 5.5.4 Land Values and Range of Land Values Near Interchanges

d. Group L1

This group contains the locations in surrounding area of BSD and has potential for future development. This situation resulted in big gaps between the highest and lowest land values.

e. Group L2

This group contains low urbanization area or undeveloped area resulting in low land prices and small gaps between the highest and the lowest.

f. Group L3

This group belongs to Kota Depok. Urbanization is in progress and developed area is widely spread out around the railway stations or along arterial roads. However, some vacant areas still remain between the developed ones. Land values are rather high in this group although the locations are distant from the existing interchanges, but there are significant gaps between the highest and the lowest land values.

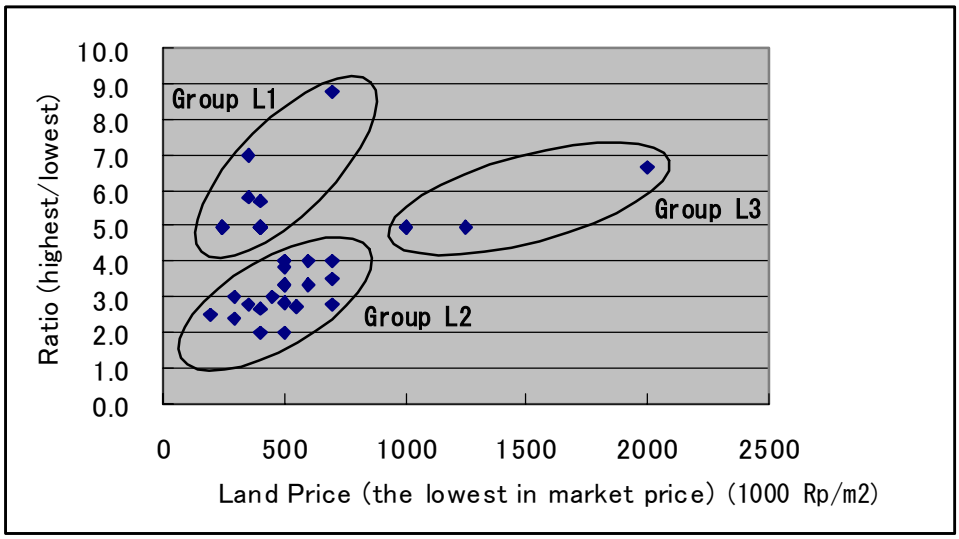


Figure 5.5.5 Land Values and Range of Land Values Far from Interchanges

2) Factors Affecting Land Value Gaps

The market land values are determined by many factors as follows:

- Distance from CBD of Jakarta;
- Type of land use;
- Extent of infrastructure development including road, and
- Estate development like new town or none.

The land-price gap analysis contains many factors mentioned above and many implications. Although a simple and easy conclusion seems inappropriate, nonetheless, it can be said that toll road contributes to higher land prices in comparison to those far from the toll road.

3) Impacts by 2nd JORR

The length of 2nd JORR is as long as around 110 km in total and considerable impacts would be given to the areas along this route. In this section only the impacts on large-scale area development mentioned above is to be discussed. The case of Merak Toll Road looks similar to that of 2nd JORR because the area between Cikampek Toll Road and Jagorawi Toll Road is less developed at present, and required new area development is rather huge in scale like BSD. Based on this premise, the land prices near interchanges after completion of 2nd JORR are expected to be around 10 times of the current prices.

4) Return of Development Benefits

The discussions and analyses in the previous sections do not explain speculation in land but extents of development benefits. In other words, the main issue is how to return the part of development benefits not to estate developers but to the public welfare. In this context, it can be justified that real estate developers provide, to some extent, the land for 2nd JORR through the implementation of area development.

5.6 TRAFFIC DEMAND FORECAST

5.6.1 Cases of Demand Forecast

(1) Basic Conditions

According to the demand forecast, which was carried out in the master plan stage of the study, the following basic conditions are set up prior to a discussion of alternative cases for demand forecast on 2nd JORR:

- Distance-proportionate tariff rate of 350 Rp/ km (the old rate is used to be consistent with the results in the master plan, SITRAMP, though a new tariff was currently applied by Jasa Marga).
- Planned toll roads of Antasari toll road in Depok and Jatiasih toll road in Bekasi are deleted to clarify the impacts of 2nd JORR.

(2) Factors to Compose Alternative

Based on the fundamental conditions mentioned above, the following alternative cases are set up with a view to discussing the development features of 2nd JORR (see Table 5.6.1):

Table 5.6.1 Factors for Alternatives

Factors	Main Alternatives	Incidental Alternatives
1) Route	- West route of Soekarno Hatta International Airport - East route	
2) Toll section	- From Cengkareng Access to Jagorawi - From Cengkareng Access to Cikampek Toll - All sections	- The route other than the one mentioned on the lefthand side is toll free road (as high mobility highway) - The route other than the one mentioned on the lefthand side has no connection.
3) Area development near Siliwangi and Setu interchanges	- With area development - Without area development	

(3) Alternative Cases

Based on the above, seven alternative cases for traffic demand forecast were arranged as follows:

Table 5.6.2 Alternative Cases for Demand Forecast

Case Code	1) Route around Airport	2) Toll Section		3) Area Development
		Toll Section	Other Section	
RW1	West route	All sections	-	Without
RE2	East route	All sections	-	Without
REA-A1	East route	All Section	-	With
REA-C1	East route	From Cengkareng to Cikampek	Toll free (HMH)	With
REA-J1	East route	From Cengkareng to Jagorawi	Toll free (HMH)	With
REA-C2	East route	From Cengkareng to Cikampek	No connection except existing roads	With
REA-J2	East route	From Cengkareng to Jagorawi	No connection except existing roads	With

Note: HMH: high mobility highway

(4) Traffic Demand by Case

The results of traffic demand are summarized in Figure 5.6.1.

Section /Case	Cengkareng Access	Teluk Naga (if West)	Daan Mogot	Merak Toll Road	Jl. Serpong Raya	Serpong Toll Road	Jl. Cinangka Raya	Jl. Meruyung	Jl. Margonda	Bogor Raya	Jagorawi	Jl. Trace Yogi	Jl. Siliwangi	Setu/Jl.S.Parman	Cikampek Toll Road	New Rd for Cikarang	Jl. Babelan	JORR E Section
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
RW1	2,800	1,300	30,000	53,700	40,900	48,300	55,400	45,400	59,200	54,500	20,600	18,100	15,500	6,400	7,300	7,300	7,100	
RE2	14,400	14,400	31,600	54,800	41,000	48,400	55,100	45,000	59,300	55,000	20,500	17,900	15,300	6,300	7,300	7,400	7,200	
REA-A1	17,300	17,300	34,700	56,300	43,000	52,800	57,400	49,300	63,600	61,400	36,900	30,700	21,600	9,000	8,300	8,200	8,500	
REA-C1	1,740	17,400	34,300	53,300	42,300	52,300	57,600	46,500	63,000	60,900	36,300	30,000	21,000	9,600	-	-	-	
REA-J1	16,300	16,300	34,500	58,000	46,800	59,700	60,600	57,100	71,000	80,600	-	-	-	-	-	-	-	
REA-C2	16,900	16,900	35,300	56,700	43,200	52,600	57,900	49,500	63,700	61,500	37,300	30,900	21,600	9,600	-	-	-	
REA-J2	14,500	14,500	31,400	54,400	40,500	48,300	53,200	42,700	55,200	47,500	-	-	-	-	-	-	-	

Figure 5.6.1 Traffic Demand by Case in 2020 (pcu)

(5) Demand Comparison Analysis

The results of traffic demand forecast reveal the following features of 2nd JORR:

1) Route around Airport

Comparing Case RW1 with RE2, the traffic volume by route is as follows:

- West route: 2,800 pcu
- East route: 14,400 pcu

This clearly indicates that the east route has much traffic volume than that of west route and has higher viability as toll road.

2) Toll Section

Comparison between case REA-A1, REA-C1 and REA-C2 shows the difference of traffic volume in case the toll section is limited to the section from Cengkareng Access Road to Cikampek. The result indicates that any conspicuous differences in traffic volume cannot be seen between Cengkareng Access Road and Jagorawi in the three cases. In other words, little traffic volume goes through Cikampek Toll Road, even in case of no high mobility highway from Cikampek to the east of JORR.

Table 5.6.3 Impact by Cikampek to East JORR

Unit: pcu/day

Case	Conditions	Cengkareng Access	Merak Toll Road	Serpong Toll Road	Jagorawi Toll Road	Cikampek Toll Road	JORR E Section	
RE2	No area development		20,800	44,600	50,500	13,500	7,300	
REA-C1	With area development*1)		23,700	46,500	54,700	17,100	8,400	
REA-C2	Toll Road is up to Cikampek*2)		23,700	46,700	54,800	21,400	-	

Note: *1) Cikampek Toll and East JORR is high mobility highway (toll free)

*2) Cikampec Toll and East JORR is existing road only

According to another comparison between REA-A1, REA-J1 and REA-J2, the toll-free high mobility highway induces the traffic into eastside section from Serpong Toll Road on 2nd JORR. However, the west side from Serpong Toll Road has nothing to do with the road network condition at the east side of Jagorawi Toll Road.

Table 5.6.4 Impact by Jagorawi to East JORR

Unit: pcu/day

Case	Conditions	Cengkareng Access	Merak Toll Road	Serpong Toll Road	Jagorawi Toll Road	Cikampek Toll Road	JORR E Section
REA-A1	No area development	23,700	44,600	54,700	17,000	8,400	
REA-J1	With area development*1)	23,000	49,700	62,900			
REA-J2	Toll Road is up to Cikampek*2)	20,700	44,100	48,100			

Note: *1) Jagorawi Toll and East JORR is high mobility highway (toll free)

*2) Jagorawi Toll and East JORR is existing road only

3) Impact of Area Development around Siliwangi and Setu Interchanges

Comparison between RE2 and REA-A1 shows the difference between "with" and "without" area development. The result clearly indicates that traffic volume on the section between Jagorawi Toll Road and Cikampek Toll Road increases by a maximum of 16,400 pcu and a minimum of 3,300 pcu. Most of additional traffic induced from the area development mainly flows for Jagorawi Toll Road from Siliwangi and Setu interchanges.

Table 5.6.5 Impact by Area Development

Unit: pcu/day

Case	Conditions	Jagorawi Toll Road	Jl. Trace Yogi	Jl. Siliwangi	Setu/ Jl. S. Parman	Cikampek Toll Road	New Rd for Cikarang	Jl. Babelan	JORR E Section
RE-2	No area development	20,500	17,900	15,300	6,300	7,300	7400	7,200	
REA-A1	With area development	36,900	30,700	21,600	9,000	8,300	8200	8,500	

4) Major Conclusions

According to the above comparison, the following major features can be observed:

- The east route around the International Airport should be taken as the preferable alternative alignment for 2nd JORR, while the west route may be taken into consideration as new area development along the route, which has been planned by Kabupaten Tangerang, as progress is made in the future.

- Estimated traffic volume showing less than 10,000 pcu in 2020 clearly indicates that the section between Cikampek Toll Road and the east section of JORR has no viability as the toll road at this moment. In addition, no strong connection between the north side and

south side of Cikampek Toll Road can be observed. Implementation of this section may be considered as the progress of new area development in Babelan region in Kabupaten Bekasi continues, whether as high mobility highway or toll road.

- Construction of high mobility highway (toll free) between Jagorawi Toll Road and Cikampek Toll Road has big impact to induce traffic volume between Serpong Toll Road and Jagorawi Toll Road. Traffic demand forecast revealed that the 2nd JORR section between Jagorawi Toll Road and Cikampek Toll Road has not much traffic. Possibility of construction of this section has to remain as even high mobility highway (toll free) to promote sub-center development in Jabodetabek.

- As mentioned above, the section between Jagorawi Toll Road and Cikampek Toll Road has important meaning when discussion turns to sub-center development scenario. In this context, it is obvious that area development between Siliwangi and Setu interchanges contribute to betterment of viability of this section. It is strongly necessary to realize this idea and put the plan into effect.

5.7 COST ESTIMATES

(1) Preconditions

Project costs are estimated under the following preconditions:

Table 5.7.1 Major Preconditions for Cost Estimates

Item		Preconditions	Remarks
1	Exchange Rate	US$ 1 = Rp. 8500; Japanese Yen 1 = Rp. 77.92	As of the 31 Oct. 2003
2	Land price	Market land price is used to estimate land acquisition cost, considering current atmosphere on activities of public works. Compensation cost for property on the land such as buildings is estimated at around 20% of the land market price on average, judging from current land use.	Market land price was obtained by the survey, which had been conducted in the course of the Study.
3	Unit construction costs	Unit construction costs were determined based mainly on the past construction costs, which the Study team collected.	
5	Project costs	Project costs were estimated including engineering cost, contingency, VAT and land cost with compensation cost.	

(2) Project Cost

1) Category for Construction Cost

Construction costs are estimated under the following work category:

- General
- Drainage
- Earthwork
- Sub-grade preparation
- Sub-base and base course
- Pavement
- Structure
- Miscellaneous
- Lighting
- TIS / ETC

2) Construction Cost by Section

Construction cost by section was estimated as shown in Table 5.7.2.

Table 5.7.2 Construction Cost by Section

Unit: Rp. Billion

Section	Type	Construction Cost	General	Drainage	Earthworks	Subgrade Preparation	Subbase and Basecource	Pavement	Structure	Miscellaneous	TIS & ETC	Lighting	Consulting Cost
Cenkareng IC		60	2	0	0	0	0	0	45	4	0	8	119
Section 1	Main-Line	526	18	0	0	0	0	0	480	0	28	0	1,052
(L= 10.649 km)	Fr-Rd	4	1	2	0	0	0	0	0	0	0	0	7
Daan Mogot IC		25	1	2	0	0	0	2	0	7	0	12	49
Section 2	Main-Line	185	11	11	7	0	2	21	106	11	16	0	370
(L= 6.234 km)	Fr-Rd	0	0	0	0	0	0	0	0	0	0	0	0
Merak Toll JC		50	3	3	1	0	0	3	30	2	0	8	100
Section 3	Main-Line	46	5	6	4	0	1	12	5	6	7	0	92
(L= 2.763 km)	Fr-Rd	0	0	0	0	0	0	0	0	0	0	0	0
Serpong Raya IC		26	1	2	0	0	0	3	2	5	0	12	51
Section 4	Main-Line	123	13	17	12	0	4	34	6	16	21	0	246
(L= 7.854 km)	Fr-Rd	4	1	2	0	0	0	0	0	0	0	0	7
Serpong Toll JC		64	4	4	1	0	1	5	24	2	0	24	129
Section 5	Main-Line	125	14	16	12	0	4	33	8	16	22	0	250
(L= 8.263 km)	Fr-Rd	1	0	1	0	0	0	0	0	0	0	0	2
Cinangka IC		26	1	2	0	0	0	3	2	5	0	12	51
Section 6	Main-Line	76	7	8	6	0	2	17	17	8	11	0	152
(L= 4.125 km)	Fr-Rd	23	3	7	0	0	3	6	4	1	0	0	47
Limo Raya IC		25	1	2	0	0	0	2	0	7	0	12	49
Section 7	Main-Line	27	3	1	2	0	0	3	12	1	5	0	54
(L= 1.865 km)	Fr-Rd	11	2	4	0	0	2	3	0	0	0	0	22
Depok-Antasari IC		50	3	3	1	0	0	3	30	2	0	8	100
Section 8	Main-Line	106	10	9	7	0	2	17	38	8	15	0	212
(L= 5.773 km)	Fr-Rd	29	4	10	1	0	4	9	0	1	0	0	58
Margonda IC		26	1	2	0	0	0	3	2	5	0	12	51
Section 9	Main-Line	47	5	6	4	0	1	12	6	6	7	0	94
(L= 2.786 km)	Fr-Rd	2	0	1	0	0	0	1	0	0	0	0	4
Bogor Raya IC		25	1	2	0	0	0	2	0	7	0	12	49
Section 10	Main-Line	56	6	7	5	0	1	14	8	7	9	0	113
(L= 3.275 km)	Fr-Rd	21	2	5	0	0	2	4	7	1	0	0	42
Jagorawi JC		50	3	3	1	0	0	3	30	2	0	8	100
Section 11	Main-Line	29	5	2	3	0	1	5	2	2	8	0	57
(L= 2.974 km)	Fr-Rd	11	0	0	0	0	0	0	10	0	0	0	21
Yogie IC		26	1	2	0	0	0	3	2	5	0	12	51
Section 12	Main-Line	39	10	0	6	0	0	0	8	0	15	0	78
(L= 5.759 km)	Fr-Rd	3	1	1	0	0	0	0	0	0	0	0	5
Siliwangi		26	1	2	0	0	0	3	2	5	0	12	51
Setu IC	Main-Line	126	16	17	13	0	4	33	2	16	25	0	252
(L= 9.565 km)	Fr-Rd	2	1	1	0	0	0	0	0	0	0	0	4
Setu		26	1	2	0	0	0	3	2	5	0	12	51
Section 14	Main-Line	133	15	19	13	0	4	37	3	18	23	0	265
(L= 8.758 km)	Fr-Rd	0	0	0	0	0	0	0	0	0	0	0	0
Cikampek JC		50	3	3	1	0	0	3	30	2	0	8	100
Section 15	Main-Line	605	19	0	0	0	0	0	556	0	30	0	1,210
(L= 11.270 km)	Fr-Rd	1	0	0	0	0	0	0	0	0	0	0	1
New Road IC		26	1	2	0	0	0	3	2	5	0	12	51
Section 16	Main-Line	258	9	0	0	0	0	0	236	0	14	0	517
(L= 5.222 km)	Fr-Rd	2	0	1	0	0	0	0	0	0	0	0	3
Babelon IC		26	1	2	0	0	0	3	2	5	0	12	51
Section 17	Main-Line	511	19	0	0	0	0	0	463	0	29	0	1,022
(L= 11.065 km)	Fr-Rd	15	3	7	0	0	1	2	2	0	0	0	30
JORR JC		60	2	0	0	0	0	0	45	4	0	8	119
Total	Main-Line	3,685	216	157	99	0	27	285	2,206	194	285	204	7,358
	Fr-Rd	129	18	42	1	0	12	25	23	3	0	0	253
Grand Total		3,814	234	199	100	0	39	310	2,229	197	285	204	7,611

3) Project Cost by Major Section

Project cost including consulting fee, physical contingency, VAT and land acquisition cost is shown in Table 5.7.3.

Table 5.7.3 Project Cost by Major Section

Unit: Billion Rp.

IC/JC	Length (km)	Const. Cost	Others	Land Cost	Project Cost
Cenkareng					
Merak Toll Road	16.9	800.0	248.1	420	1,468.2
Serpong Toll Road	10.6	248.6	77.0	246.7	572.3
Jagorawi	26.1	741.0	229.4	878.0	1848.4
Cikampek	27.1	470.8	145.8	276.1	892.7
JORR	27.6	1,553.9	481.6	239.7	2,275.2
Total	108.2	3,814.3	1,181.9	2,060.6	7,056.8

5.8 ENVIRONMENTAL AND SOCIAL CONSIDERATION

5.8.1 Examination of AMDAL Requirement

(1) Criteria for AMDAL Requirement

Each segment of Outer-Outer Ring Road project will be implemented in toll road or arterial road corresponding to the forecasted traffic demand. However, it is recommended that the project proponent integrate AMDAL to analyze impacts cumulated by several segments, which will start their operation in close succession. The reason is that the integrated evaluation contributes to illuminating potential issues, which might be overlooked by analyzing fragmentary impacts. In order to implement the integrated AMDAL, some of the segments need to be bundled in a project package and the scale of the project package must be compared with the criteria for AMDAL requirement shown in Table 5.8.1.

Table 5.8.1 National Criteria for AMDAL Requirement (Road Construction)

Project Type	National Screening Criteria
Construction of Toll Road	All
Construction of New Road with Land Acquisition	Length : 5 km or Extent Area : 5 ha (for Big city/Metropolitan)

(2) Project Proponent and Relevant Agencies

According to Kimpraswil, the project proponent of toll road has been either Kimpraswil or Jasa Marga, even though Kimpraswil is assigned to work as both a regulator and a project proponent while Jasa Marga is assigned to work as an operator. The confusion of demarcation would be resolved in the case that Kimpraswil will be enforced to work as both the regulator and the project proponent of toll road. In the case of arterial road, Kimpraswil has been the project proponent in most cases. Consequently, whether the project type is toll road or arterial road, the proponent is supposed to be Kimpraswil as shown in Table 5.8.2.

Table 5.8.2 Project Proponent Proposed and Relevant Agencies

The Proponent	Project Type	Relevant Agencies	Tasks assigned
Kimpraswil	Toll Road or Arterial Road	Local Government	Implementation of Land acquisition Construction of Frontage Road
		MLH	EIA Secretariat

(3) Other Stakeholders

In addition to the project proponent and relevant agencies, stakeholders of the project are preliminary identified as shown in Table 5.8.3.

Table 5.8.3 Preliminary Identification of Stakeholders

Categories	Features of the People/Group
Beneficiaries	- Users of the Outer-Outer Ring Road - Operator of the Outer-Outer Ring Road
Negatively Affected Groups	- Individuals/households/business enterprises/public facilities who have to give up a part of their property (land, building) but no need to resettle. - Individuals/households/business enterprises/public facilities who have to give up all of their property and resettle - Users of public facilities mentioned above - Illegal occupants on the project site such as squatters and street vendors - (People living near the Outer-Outer Ring Road & its connecting roads)
Implementing agencies	- Project Proponent & relevant agencies (see Table 5.8.2)
Funding agencies	- Unknown yet
Local & Community leaders	Following leaders in the project area and its surrounding areas - Head of Kecamatan - Head of Kelarahan / Desa - Head of RT & RW - Leaders of various community groups
Potential Opponents	- Social Groups/NGOs which concern environmental issues - Social Groups/NGOs which concern interests of the negatively affected groups mentioned above
Supporting Groups	- Private developers - People who have intention to possess or rent house to settle in outer areas of DKI Jakarta - (People living near the Outer-Outer Ring Road & its connecting roads)

(4) Scoping of Natural Environment

There are some differences among segments in terms of natural environmental impacts due to regional differences of environmental conditions. The possible impacts are described for each segment in Table 5.8.4 and natural environmental issues are scoped as shown in Table 5.8.5.

Table 5.8.4 Possible Impacts by Segment (Natural Environment)

Segment	Possible Impacts Description
Chengkareng Access – Merak Toll road	Soft ground lies over the segment and the construction would cause land subsidence and lower level of ground water.
Merak Toll road - Cinangka Raya	Low density housing area lies over the segment and they would suffer from air pollution, noise and vibration caused by the construction and the operation.
Cinangka Raya - Jagorawi Toll road	Some parts of the alignment lie nearby housing development area and they would suffer from air pollution, noise and vibration caused by the construction and the operation. And they lie in undulating (wavy) terrain and across rivers, therefore the impacts on soil erosion and water quality are considered.
Jagorawi Toll road - Cikampek Toll road	Agriculture and open space lie over the segment and fewer impacts would be caused than in the others.
Cikampek Toll road – JORR E Section	Soft ground lies over the segment and the construction would cause land subsidence and lower level of ground water. And the project might eliminate the area for water catchment and then cause more serious flooding problem.

Table 5.8.5 Possible Impacts on Natural Environment

Possible impact		Construction stage	Operational Stage
Natural Environment	(1) Air Quality	A	A
	(2) Water Quality	B	-
	(3) Noise & Vibration	A	A
	(4) Health	A	A
	(5) Topography & Geology	A	B
	(6) Hydrology	C	C
	(7) Flora & Fauna	B	B
	(8) Wastes	B	-
	(9) Landscape	B	-

A: Serious impact expected, B: Impact expected, C: Unknown, -: No/Negligible Impact expected

(5) Scoping of Social Environment

Since the project covers very large areas, land use is diverse so that the impacts also vary. General characteristics of land use are distinct from each segment of the project as shown in Table 5.8.6.

Table 5.8.6 Land Use of Surrounding Areas of the Project

Segment	Characteristics
Cengkareng Access – Merak Toll road	There is productive agricultural field and semi-urban style settlement on the south of the airport. Surroundings of Jl. Daan Mogot are built-up with factories, commercial buildings and urban settlements, so it will be most critical part in terms of land acquisition. To the south toward Merak Toll, low-density settlements and housing complex are found.
Merak Toll road – Cinangka Raya	Low-density settlements and agricultural fields are dominant.
Cinangka Raya – Jagorawi Toll road	This segment is most densely populated. Along the route, there are middle- or high-class housing complexes and some public facilities such as Univ. of Indonesia campus. Some houses in these housing complexes will definitely include those within the project's right-of-way.
Jagorawi Toll road– Cikampek Toll road	Agricultural fields and low-density rural settlements are dominant. Near Cikampek Toll, the route passes through industrial areas.
Cikampek Toll road– JORR E Section	After passing industrial areas, there are productive agricultural areas that are mostly irrigated paddy fields.

It is clear that land acquisition greatly affects the life of people in and around the project area. First, some lose a part or whole of their houses. Along the route, there are some housing complexes, especially in Cinangka Raya – Jagorawil Toll section, and are rural and urban settlements. Second, some lose the basis of their livelihood. For instance, in the northern part of Kabupaten Bekasi (Cikampek Toll Road – JORR E Section) where irrigated paddy field spread, some farmers will lose their productive agricultural field. Those who do business such as running a shop will lose their facilities as well as opportunities for their business.

During and after construction stage, the project will interrupt travel and communication of people across the 2nd JORR. Travel needs for people in surrounding areas should be taken into consideration. In medium- and long-run, the project will change traffic flow and volume. On the roads having direct access to the 2nd JORR, traffic volume might increase and interchange will be congested. These forecasted impacts on traffic should be carefully examined

Implementation of the project might also trigger housing and commercial development. The new development activities will turn in either positive or negative impact on different stakeholders. Some will get nice housing with good access to toll road while the others be ousted from the place where they have lived and worked. New development activities also have possibilities to deteriorate living environment.

In conclusion, influence of the project over the social environment will be significant. Possible impacts and degree of their seriousness are summarized in Table 5.8.7.

Table 5.8.7 Possible Impacts on Social Environment

Possible impact		Construction stage	Operational Stage
Social Environment	(1) Land acquisition & Involuntary resettlement	A	A
	(2) Split Community	A	A
	(3) Socio-economic activities	A	A
	(4) Traffic activities	A	A
	(5) Land use	C	A/B
	(6) Cultural property	C	C

A: Serious impact expected, B: Impact expected, C: Unknown, -: No/Negligible Impact expected

5.8.2 Preliminary Examination of EIA Methodologies

It is not recommended that an integrated EIA be conducted for a whole project because some segments will be delayed and remain in too early a stage to begin EIA in AMDAL procedure. On the other hand, fragmentary EIA, which means a separate EIA for each segment, should be avoided because the cumulative impacts will not be illuminated and analyzed.

Therefore it is recommended to integrate EIA for several segments, which are connected together and supposed to start their construction within three years, because basically the completion of AMDAL procedure is legally valid for three years.

(1) Natural Environment

Methodology of natural environmental impact assessment in AMDAL is proposed as shown in Table 5.8.8.

(2) Social Environment

Methodology of social impact assessment in EIA is proposed in Table 5.8.9.

Table 5.8.8 Methodologies on Natural Environment (1/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis	Methodology of Impact Forecasting	Methodology of Evaluation of Forecasted Impact
(1) Air Quality	Construction stage: Construction machines and trucks would emit air pollutants and earthwork would cause particulates. Operational stage: Heavy traffic on the project route would cause significant impacts on air quality along the alignment.	If continuous monitoring data measured (BPLHD, etc.) at a monitoring station near to project site (Secondary data) are available, they would be most reliable for long-term evaluation. However air quality survey (Primary data) should be implemented since monitoring station locates away from project site and the monitoring data might not describe its own characteristics. Therefore long-term trend should be analyzed by continuous monitoring data and the analyzed trend would be converted to the project site properly by comparing on-site survey data with the continuous monitoring data in the survey periods. The survey points should be located at environment-sensitive area/sites, namely housing area, hospitals and schools adjacent to the project site, which should be identified on a map.	For forecasting the construction and the traffic impact on air quality, Gausian model is simple and commonly used as the simulation method adopted in EIA. It requires emission condition and weather condition (wind direction/velocity) for the simulation. Emission condition consists of the condition of traffic flow (construction/operational stage) or construction machines (construction stage) and emission factors. Traffic condition should be acquired from traffic demand forecast for construction and operational stage. Weather condition, namely wind condition, should be the average of past 5 years or more to eliminate yearly bias. For determining background concentration, long-term average concentration at continuous monitoring station is necessary. The background concentration should be determined by analyzing recent trend of the average concentration.	There are two ways to evaluate the forecasted impacts, which are to compare the simulated concentrations with air quality standards and with current concentrations in pre-construction stage. Basically the impacts should be evaluated with the standards and appropriate countermeasures should be planned for a significant impact. However, if some forecasting points have higher concentrations than the standards even in current situation, it would be better to evaluate the impact with current situation.
(2) Water Quality	Construction stage: Construction work of bridges would worsen especially turbidity.	Regular monitoring data on water quality are available in major rivers. If the rivers crossing the project sites are monitored and the sampling points are near to crossing points, monitored data should be collected and analyzed. And for the other rivers, on-site survey should be conducted.	Since the impact would be limited in construction stage, the impact would be forecasted in empirical method by considering construction activity at the crossing points.	The impact should be evaluated with the standards or the current concentration. If the current concentrations are already above the standards, the impact should be minimized by appropriate construction methods.

Table 5.8.8 Methodologies on Natural Environment (2/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis	Methodology of Impact Forecasting	Methodology of Evaluation of the Impact
(3) Noise & Vibration	<u>Construction stage:</u> Construction machine and trucks would make noise and vibration. <u>Operational stage:</u> Heavy traffic would cause significant impacts on noise and vibration along the alignment.	For Noise & Vibration, secondary data might not be expected, therefore the current condition should be analyzed by on-site survey. On-site survey should be measured in LAeq, A-weighted noise equivalent level for noise and in L10, 90-percentile level, for vibration and conducted especially at the traffic peak hours, i.e. morning and evening hours. The survey points should be located at environment-sensitive area/sites, namely housing area, hospitals, schools and worship facilities adjacent to the project site, which should be identified on a map.	A-weighted noise equivalent level for one hour, LAeq-1hour, should be applied for accurate noise forecasting. It requires power levels of vehicle traffic noise depending on traffic speed. For vibration, advanced simulation method, like the model empirically developed in Japan, should be adopted and it may require ground condition (e.g. ground specific predominant frequency) and traffic condition.	The impact should be evaluated with the standards or the current noise/vibration level. However if the standards are considered inappropriate, the appropriate one should be adopted to evaluate the impacts.
(4) Health	<u>Construction/Operational stage:</u> Health of people living along the project site would be affected by construction machines in Construction stage and traffic in Operational stage.	The project will have certain health impact mainly by air pollution and noise. Therefore the number of patients with respiratory and/or hearing problems at hospitals in adjacent area to the project site should be examined as Secondary Data.	The project impacts on health due to air pollution and noise could be presumed by the impact forecasting conducted in “Air Quality” and “Noise.”	An evaluation of Health impacts should be conducted on existing epidemiological study (e.g. WHO guidelines) It is quite important to monitor the number of the patients continuously from pre-construction to operational stage, since considerable increase of the number might be the result of the project if any other condition is not considered to change.

Table 5.8.8 Methodologies on Natural Environment (3/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis	Methodology of Impact Forecasting	Methodology of Evaluation of the Impact
(5) Topography & Geology	Construction stage: (Land subsidence) In northern part of the alignment on soft ground, the construction work would cause land subsidence. Construction/Operational stage: (Soil erosion) Several segments lie in undulating (wavy) terrain.	Soil data could be obtained from on-site survey, soil bearing capacity survey as primary data. Secondary data would be obtained from maps, namely geological, hydrological, pedological and topographic as well as aerial photographs/satellite images.	Land subsidence could be forecasted by considering soil condition and construction method adopted. The construction work would pump up ground water and then lower level of water table and contribute land subsidence as well. Soil erosion could be forecasted from the balance between soil situation and slopes created by road embankments/cuts. They might occur if the slopes are steeper than surrounding natural slopes.	Land subsidence should be evaluated for possible damage of existing buildings and infrastructures in affected area. Soil erosion should be evaluated as impacts on local rivers and mitigation measure (e.g. Replanting) should be considered in case of significant impact evaluated.
(6) Hydrology	Construction stage: (Lower ground water level) The construction work adopted on soft ground would lower ground water level. Operational Stage: (Flooding) The project might eliminate the area for water catchment and/or modify surface water flow. They would cause adverse impact on flooding.	For ground water level, on-site survey could show ground water level and current velocity/direction. And as secondary data, location of well fetching water from affected aquifer should be collected. For flooding, as secondary data, regular monitoring data on water speed and level at the crossing rivers, with the climatologic situation at monitoring, are important hydrological information. And the boundary data of floodable zones are also significant.	For ground water level, the level could be forecasted by aquifer conditions and underground structure of the project. For flooding, an amount of runoff could be forecasted from the project site area and intensity of rainfall. The additional volume of runoff would be estimated by the difference of runoff coefficient between pre-construction and operational stage. And it would increase water level of rivers connected to the drainage system and the level at heavy rain should be forecasted.	The impact on Ground water level should be evaluated generally and at affected wells. Flooding should be evaluated mainly as water level of rivers connected and mitigation measures (e.g. infiltration ditches) should be proposed in case of significant impact evaluated.

Table 5.8.8 Methodologies on Natural Environment (4/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis	Methodology of Impact Forecasting	Methodology of Evaluation of the Impact
(7) Flora & Fauna	<u>Construction/Operational stage:</u> At an ecosystem crossed by the road alignment, the project would cause habitat fragmentation and habitat loss.	Firstly, legally protected area should be identified in the project site, which preserves precious species. Secondly, academic/non-academic experts' information at the project site will be comprehensive as secondary data. However, their information might be too subjective, on-site survey, exploration method with sampling, would be required to supplement and improve their information.	The impact forecasting approach will need the experts. Their advice based on their empirical knowledge should be complied and integrated for the impact assessment. Furthermore, analogical method would be also appropriate if similar project impact is observed in the area with similar characteristic of flora and fauna.	The evaluation should be based on the experts' empirical knowledge. And the possibility of mitigation and transplanting should be also evaluated if the impact is identified significant.
(8) Wastes	<u>Construction stage:</u> Construction wastes, especially excavated soil and domestic wastes of workers, would be generated.	The situation of dumping sites of surplus soil from the construction should be examined. Amount of domestic wastes should be examined in adjacent area to the project site.	Amount of the soil could be estimated from the construction work plan specified by project design. Amount of the domestic wastes could be estimated from the number of man-months required in the construction work plan.	The impact of the soil should be evaluated by the estimated amount and the capacity of the dumping sites. The impact of the domestic wastes should be evaluated by additional amount of the project wastes in proportion to the amount in pre-construction stage.
(9) Landscape	<u>Construction stage:</u> Construction trucks carrying soil would strew dust in a trail across the road.	The situation of the major roads connecting to the project sites should be observed in pre-construction stage.	Analogical method would be appropriate if similar project impact is observed in the similar road projects.	The evaluation should be based on the experts' empirical knowledge. And a guideline to reduce the impact should be proposed if the impact is identified significant.

Table 5.8.9 Methodologies on Social Environment (1/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis * Required Data & Information * Method of Data Collection & Source of Data	Methodology of * Impact Forecasting * Evaluation of Forecasted Impact
(1) Land acquisition & Involuntary resettlement *(Those who live or do their business in the areas which need to be acquired for the project)*	1) It will weaken socio-economic situation of households which lost their property (e.g. loss of job opportunities, deterioration of housing condition, loss of community relationship) 2) People will have difficulty to adjust to the new settlement place (e.g. conflict with other residents, difficulty to get job) 3) Removal of some social facilities will cause inconvenience to their users	Required data & information • Data & information of ***land acquisition area***: - Population, number of households, characteristics of households (housing & land status, living conditions, occupation, income, etc.) - Land use pattern & inventory of existing infrastructure (property/land right status, location & area of houses, local road, social facilities, agricultural field, commercial & business facilities) - Socio-cultural characteristics of community (community history & profile, ethnic & geographical origin, custom & tradition, socio-cultural group & its activities, mutual help, communal property & facilities) Method & Source (Primary data & information) • Household interview (sample HHs, using questionnaire) • Key informant interview (RT/RW leader, leader of various social groups, local government officials) • Direct observation (Secondary data & information) • Relevant maps & statistics obtained from: - Local government (e.g. Camat, Lurah) - Local office of National Land Agency (BPN) - Local office of National Statistics Agency (BPS), and - Other relevant government agencies (e.g. Dinas Tata Kota)	**(Impact forecasting)** Required data & information • Opinion & perception from project affected people (PAP) and other relevant stakeholders • Experience of similar projects Method & Source • Household interview (sample HHs, using questionnaire) • Key informant interview ((RT/RW leader, leader of various social groups, local government officials, local NGOs, intellectuals, experts) • Group discussion (by different stakeholders) • Project document & research paper of similar projects **(Evaluation of forecasted impact)** Required data & information • Number of PAP • Project affected area (m^2) • Degree/seriousness of impact • Period of impact continued Method & Source • Empirical knowledge of expert • Analysis of obtained data & information • Project document & research paper of similar projects

Table 5.8.9 Methodologies on Social Environment (2/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis * Required Data & Information * Method of Data Collection & Source of Data	Methodology of * Impact Forecasting * Evaluation of Forecasted Impact
(2) Split community	1) The project will cut traditional lines of travel or communication of people.	Required data & information • Data & information of ***surrounding area of the project*** - Population, number of households, characteristics of households (housing & living conditions, occupation, income, etc.) - Land use pattern & inventory of existing infrastructure (location & area of houses, local road, social facilities, agricultural field, commercial & business facilities) - Socio-cultural characteristics of community (community history & profile, ethnic & geographical origin, custom & tradition, socio-cultural group & its activities, mutual help, communal property & facilities) Method & Source (Primary data& information) • Household interview (sample HHs, using questionnaire) • Key informant interview (RT/RW leaders, leaders of various social groups, local government officials, staff of social facilities such as school, hospital, farmers, market traders) • Direct observation (Secondary data & information) • Relevant maps & statistics obtained from: - Local government (e.g. Camat, Lurah) - Local office of National Statistics Agency (BPS), and - Other relevant government agencies	**(Impact forecasting)** Required data & information • Opinion & perception from project affected people (PAP) and other relevant stakeholders • Experience of similar projects Method & Source • Household interview (sample HHs, using questionnaire) • Key informant interview ((RT/RW leader, leader of various social groups, local government officials, local NGOs, intellectuals, experts) • Group discussion (by different stakeholders) • Project document & research paper of similar projects **(Evaluation of forecasted impact)** Required data & information • Number of PAP • Project affected area (m^2) • Degree/seriousness of impact • Period of impact continued Method & Source • Empirical knowledge of expert • Analysis of obtained data & information • Project document & research paper of similar projects
(3) Socio-economic activities *(Those who live or do business in the surrounding area of the project)*	1) Split community as well as change of land use pattern will affect economic activities of local people and most possibly enervate them. 2) Split community as well as change of land use pattern will weaken community ties & relationships. 3) The project will make it difficult for local people to access social service facilities located at opposite side of the road. 4) Change of traffic flow/volume (including connecting roads) caused by the project will influence on socio-economic activities		

Table 5.8.9 Methodologies on Social Environment (3/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis * Required Data & Information * Method of Data Collection & Source of Data	Methodology of * Impact Forecasting * Evaluation of Forecasted Impact
(4) Traffic activities	1) The project will change traffic volume/flow of the roads in surrounding areas. 2) The project will aggravate traffic jam on the connecting roads.	Required data & information • Data explaining current situation of traffic - Traffic volume, travel time (speed) Method & Source (Primary data& information) • Traffic survey (Secondary data & information) • Relevant statistics obtained from: - Relevant government agencies (e.g. DLLAJ, traffic police)	**(Impact forecasting)** Required data & information • Traffic demand forecast • Opinion & perception of relevant stakeholders • Experience of similar project Method & Source • Analysis of obtained data • Key informant interview and/or group discussion (Leader of various social groups and residents in surrounding areas, local government officials, local NGOs, intellectuals, experts) • Project document & research paper of similar projects **(Evaluation of forecasted impact)** Required data & information • Degree of traffic jam Method & Source • Empirical knowledge of expert • Analysis of obtained data & information • Project document & research paper of similar projects

Table 5.8.9 Methodologies on Social Environment (4/4)

Issue	Preliminary Forecasted Impact	Methodology of Data Collection/Analysis * Required Data & Information * Method of Data Collection & Source of Data	Methodology of * Impact Forecasting * Evaluation of Forecasted Impact
(5) Land use	1) Housing and commercial development will be encouraged so that it will impact on socio-economic activities of people (e.g. hike of land price, decline of local industry)	Required data & information • Data & information of development plan - Housing development, commercial & business development - Regional Spatial Structure Plan (RTRW) of local government Method & Source • Relevant maps & planning document obtained from: - Private developers - Housing Agency (Perumnas) - Relevant local government agencies (e.g. Bappeda, Dinas Tata Kota, Dinas PU)	**(Impact forecasting)** Required data & information • Opinion & perception from relevant stakeholders • Experience of similar projects Method & Source • Key informant interview (private developers, local government officials, intellectuals, experts) • Project document & research paper of similar projects **(Evaluation of forecasted impact)** Required data & information • Degree/seriousness of impact Method & Source • Empirical knowledge of expert • Analysis of obtained data & information • Project document & research paper of similar projects
(6) Cultural property	1) Cultural property located in/along the project area will be damaged.	Required data & information • Location, area, and the profile of cultural property in/along the project area Method & Source (Primary data & information) • Direct observation • Key informant interview (relevant government officials, community leaders, traditional users of the property) (Secondary data & information) • Relevant maps and document obtained from: - Information office at the cultural property - Tourism Authority, and - Relevant local government agencies	**(Impact forecasting)** Required data & information • Opinion & perception from relevant stakeholders • Experience of similar projects Method & Source • Key informant interview (local government officials, intellectuals, experts) • Project document & research paper of similar projects **(Evaluation of forecasted impact)** • Project affected area (m^2) • Degree/seriousness of impact Method & Source • Empirical knowledge of expert • Analysis of obtained data & information • Project document & research paper of similar projects

5.8.3 Recommendations on Environmental Impact Assessment for F/S

1) In some areas along the route, new land development (possibly housing development) seems to take place. It is crucial to define the project alignment in the Feasibility Study and ask local government to restrict development activities in the supposed project areas. Otherwise, it will become more difficult to acquire necessary land for the project for future implementation.
2) Kimpraswil should manage the progress of basic design and F/S, which vary from segment to segment, and conduct integrated AMDAL for bundled segments which are connecting and will be implemented within less than three years.
3) Kimpraswil should review several alternatives, analyze their impacts comparatively and explain the results to the evaluation committee to achieve the accountability for the project. And the evaluation committee should weigh the potential environmental impacts against the project costs.
4) Land Acquisition and Resettlement Plan (LARAP) needs to be formulated for the site where involuntary resettlement of project-affected people will take place. In addition, some special measures should be considered for illegal occupants, such as squatters and street vendors in the project site, to mitigate their loss.
5) MLH should monitor the progress of the project with the support of Kimpraswil and the AMDAL procedure for the project whose site does not lie across provincial boundary in cooperation with BPLHD/BAPEDALDA.
6) Kimpraswil should conduct an integrated RPL (Environmental Management and Mitigation Plan) and RKL (Environmental Monitoring Plan), corresponding to the integrated AMDAL. And they should be broken down into more detailed action plans of RPL and RKL.
7) Kimpraswil and EIA secretariat should ensure fairness and transparency in AMDAL procedure.

5.9 ECONOMIC AND FINANCIAL ANALYSIS

5.9.1 Implementation schedule

(1) Implementation schedule

The implementation schedule of 2nd JORR project is prepared in Figure 5.9.1 considering several aspects as follows:

- The section between Serpong Toll Road and Jagorawi Toll Road has the largest future traffic volume and high priority for implementation has to be given in order to support the sub-center development scenario and to mitigate expected traffic congestion in this region.

- As mentioned in the latter section, the stretch between Jagorawi Toll Road and Cikampek Toll Road has rather high FIRR. It is, however, better to implement this stretch in the latter stages due to low traffic volume and integration with area development seems preferable.

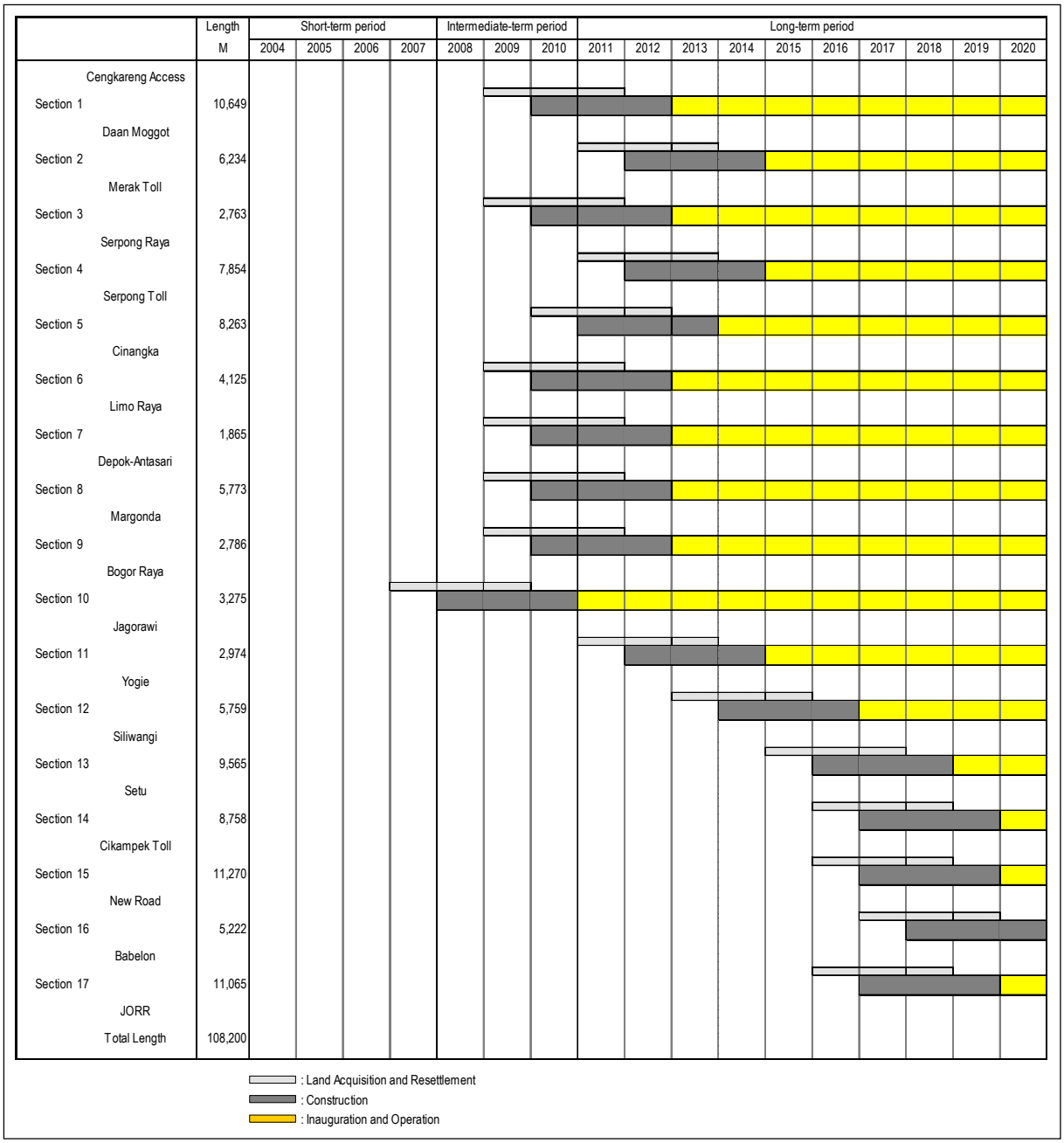


Figure 5.9.1 Implementation Schedule of 2nd JORR

(2) Annual cost allocation

Total cost of 2nd JORRR amounts to Rp. 7,491 billion during the period from 2004 to 2020, of which cost for investment is Rp. 7,057 billion and that for operation and maintenance is Rp. 434 billion. Figure 5.9.2 shows the annual cost schedule of 2nd JORR based on the implementation schedule above.

The sections which are scheduled to be implemented in the earlier stage of the master plan include rather highly populated and urbanized area; therefore high land acquisition cost is required in the beginning stage of the implementation of 2nd JORR.

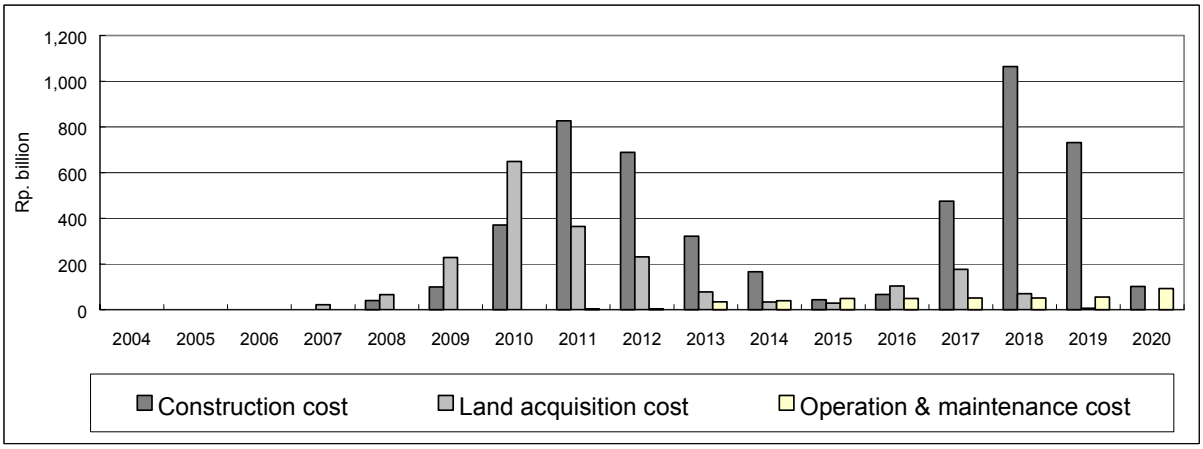


Figure 5.9.2 Annual Allocation of Investment and OM Cost of 2nd JORR (2004 ~ 2020)

5.9.2 Economic Analysis

(1) Assumptions

1) General

In order to examine the economic efficiency of the implementation of 2nd JORR project, the Cost-Benefit analysis was carried out under several assumptions of economic analysis.

In the Benefit-Cost Analysis, two scenarios, "With Project" and "Without Project" scenarios are assumed in order to distinguish and compare the benefits and costs accompanied by the implementation of the proposed alternative. In the economic analysis of 2nd JORR, the SITRAMP Master Plan is regarded as "With 2nd JORR Project Case," while "Without 2nd JORR Project Case" scenario is formulated under the assumption that only 2nd JORR Project will not be implemented in the SITRAMP Master Plan.

The following are the assumptions for general conditions in the economic evaluation.

- Project Life: 20 years after the target year of the Master Plan, i.e., 2004 to 2040.

- Life Period: Life period of facility is estimated as the following years and residual value is calculated as negative cost in the last year of the evaluation period:
- Civil Works: 50 years
- Structure and Building: 40 years
- Financial and Economic Cost: Financial costs are converted into economic cost using the conversion factor at 0.80 and 0.85 for foreign currency portion and local currency portion, respectively.
- Discount Rate: A discount rate of 12% is used.
- Foreign Exchange Rate: For the purpose of pre-feasibility study of 2nd JORR the foreign exchange rate is fixed at the following rate as of October 2003 and shadow exchange rate is not considered. US Dollar 1.00 is equivalent to Rp. 8,500 and Japanese Yen 109.08
- Inflation: Inflation is not taken into account both in benefit and cost estimates during the evaluation period.

2) Traffic demand

Traffic demand forecast of RE2 case is employed for economic analysis under the assumptions of the following alternatives:

- Route around airport: east route
- Toll section: all sections
- Without area development near Siliwangi and Setu interchanges of 2nd JORR

3) Vehicle Operation Cost (VOC) estimate

Unit vehicle operating cost is estimated by the following types of representative vehicles and operating speed. Unit VOC by type of vehicles and vehicle speed as well as the assumptions for VOC estimates are referred to Appendix of "Technical Report 10 Master Plan Evaluation" of SITRAMP Phase 2.

- Passenger car, Motorcycle, Large truck, Medium/small truck and Bus (Patas AC, Patas Non-AC, Regular bus, Medium bus and Small bus)

4) Travel time cost estimate

Hourly travel time value of passengers is estimated by three income groups based on the results of the Home Visit Survey of the SITRAMP conducted in 2002. Regarding the estimation of the future value of traveling time, it is assumed that income level will increase proportionally to the growth of the GRDP per capita estimated in the socio-economic framework of SITRAMP. Table 5.9.1 presents the average time value of passenger and annual real growth rate of time value. Inflation is not considered in the estimates.

Table 5.9.1 Average Time Value of Passenger

	Average Time Value of Passenger *1) (Rp. per hour)	Annual Real Growth Rate
2007	2,290	5.7% (2005 ~ 2009)
2010	3,890	
2020	6,510	5.9% (2010 ~ 2020)

Note 1): Indirect cost at 10% is included in time value estimates.

5) Passenger occupancy of vehicle

Average passenger occupancy rates of each type of vehicle are shown in Table 5.9.2, which is provided from the results of the Screen Line Traffic Count of the SITRAMP.

Table 5.9.2 Average Passenger Occupancy Rate by Vehicle

Unit: Passengers per vehicle

	Passenger Car	Motor -cycle	Bus		
			Large	Medium	Small
Number of passengers per vehicle	1.8	1.4	28.6	12.3	4.9

Source: Screen Line Traffic Count of SITRAMP

(2) Economic evaluation

1) Benefit and Cost

Savings in Vehicle Operating Cost (VOC) and Passenger Traveling Time Cost (TTC) were regarded as tangible benefits and measured in monetary terms as benefits of 2nd JORR project in economic analysis.

Based on the future traffic volume provided by the traffic demand forecast of the SITRAMP and unit VOC and time values of passenger by three income groups, the total value of the VOC and the TTC of two scenarios were calculated and compared for the evaluation period from 2004 to 2040. The cumulative benefits of 2nd JORR project, including the savings in the VOC and the

TTC, is Rp. 2,615 billion in terms of the present value discounted by 12% throughout the evaluation period (2004 – 2040).

Meanwhile the cost of 2nd JORR including investment cost and OM cost which converted in economic prices is Rp. 2,020 billion in terms of present value discounted by 12%.

2) Evaluation

The Net Present Value (NPV) discounted by 12% is estimated at Rp. 595 billion and the Economic Internal Rate of Return (EIRR) is 16.3% as shown in Table 5.9.3, which is sufficiently high to declare the economic viability of the implementation of 2nd JORR project.

Table 5.9.3 Evaluation Index of Economic Analysis

Present Value discounted by 12 % (Rp. billion)					EIRR (%)
Costs	Benefits			Net Present Value	
	VOC Savings	Travel Time	Total Benefits		
2,020	1,265	1,350	2,615	595	16.3%

3) Sensitivity Analysis

The effect of variations in the costs and the benefits on the EIRR is examined, when the cost will increase by 20% and the benefits will decrease by 20%, simultaneously. Switching value, which is one of the tools for assessing risks for the project analysis, is also calculated. Table 5.9.4 examines the sensitivity of the EIRR of 2nd JORR project.

Table 5.9.4 Sensitivity of EIRR

Cost	Benefit	NPV discounted by 12 % (Rp. billion)	EIRR
Base Case		595	16.3 %
10 % Decrease		797	18.2 %
20 % Increase	-	191	13.1 %
-	20 % Decrease	72	12.5 %
20 % Increase	20 % Decrease	-332	10.1 %
30 % Increase (Switching value *1)of cost increase)	-	0	12.0 %
-	23% Increase (Switching value of benefit decrease)	0	12.0 %

Note 1): The switching value of a variable is the value at which the NPV becomes zero or the EIRR equals the discount rate.

The indices of sensitivity analysis reveal the following:

- The EIRR of the project remains higher than the discount rate when only the cost increases by 20% as well as when only the benefit decreases by 20%.

- The EIRR decreases to 10.1% which is lower than the discount rate when the cost will increase by 20% and the benefits will decrease by 20%, simultaneously.

- Switching value shows that increase in cost by 30% makes the NPV zero and decrease in benefit by 23% makes the NPV zero.

- On the other hand, decrease in cost by 10% will raise the EIRR to 18.2% from 16.3% of Base Case.

4) Indirect benefits

Highway development generates the direct and indirect benefits. The major direct benefits resulting from the 2nd JORR project are savings in Vehicle Operating Cost and Passenger Traveling Time Cost, which was measured in monetary terms and included in benefits to estimate the EIRR.

On the other hand, increase in driving with comfort and convenience is also direct benefits of the project, however, it is impossible to make an estimate in monetary terms. Furthermore, the indirect benefits such as increase in land value and stimulation of economic development due to increase of accessibility are also important benefits of 2nd JORR project. These benefits will raise the rate of the EIRR of the project but it is difficult to put a value to it reasonably in monetary terms and integrate the figures into economic analysis in practice.

5) Evaluation

The EIRR of 2nd JORR was estimated at 16.3 % in Base Case, which reveals the efficiency of the project implementation of 2nd JORR. In addition, considering those intangible benefits as well as indirect benefits described above, the implementation of 2nd JORR will be worth undertaking from the viewpoint of economic analysis.

5.9.3 Financial Analysis

(1) Highway operation

In Indonesia, toll way investment and operation are provided in a form of public and private cooperation such as the forms of joint venture, joint operation, modified turnkey and profit sharing. The government provided the land and Jasa Marga and/or investors operate toll business in principle. However, the investors are required to provide the fund for land acquisition from the revenue of toll business in case when the government is unable to provide land.

In financial analysis, the financial viability of 2nd JORR was evaluated as a toll business by private investors. Cash-flow analysis was employed in order to reveal the profitability of the

project. In cash-flow analysis, the FIRR of the alternatives were estimated in order to examine whether the toll revenue will recover the cost of the project or not. The following assumptions are used in the analysis:

- Evaluation period is assumed to be 30 years after the target year of the Master Plan, i.e., from 2004 to 2050.
- Traffic volume of the demand forecast is used and the growth of traffic volume after 2020 is assumed to be 5% per year assessing the growth during 2010 and 2020.
- Additional investment cost for the extension to 6 lanes from 4 lanes is included after 2020 to 2050 due to the increase of traffic volume.
- Prices: Constant price in 2003 is used. Inflation is not taken into account both in revenue and cost estimates during the evaluation period to calculate the FIRR.

The following are important factors that will be expected to affect the profitability of the toll business of 2nd JORR project:

- Toll sections for the development by private investor
- Toll tariff level and its increase
- Land cost burden by investors
- Effect of area development on the traffic characteristic and toll revenue
- Land cost burden by developers for area development along 2nd JORR

Table 5.9.5 shows the assumptions of variable factors and alternative cases assumed in financial analysis.

Table 5.9.5 Variable Factors in Alternatives

Factors		Alternatives in financial analysis			
Toll sections		Section 1 ~ 17	Section 1 ~ 14	Section 1 ~10	Section 11 ~ 14
Toll tariff	Tariff in 2010	Rp. 350 per PCU-km	Rp. 450 per PCU-km	Rp. 500 per PCU-km	
	Annual increase rate of tariff in real terms	0 %	3 %	5 %	7 %
Share of land cost burden by investor of toll business		100 %	75 %	50 %	0 %
Land development near Siliwangi and Setu interchanges of 2nd JORR		With land development	Without land development	Without land development	Without land development
Land cost burden by developer along 2nd JORR		With cost burden by developer	Without cost burden by developer		

Table 5.9.6 shows the FIRR of 159 alternatives in combination with the alternatives as shown in Table 5.9.5. For the toll business by private investors, an FIRR over 15 % ~ 18% at the minimum is required.

Table 5.9.6 FIRR of Alternatives

	Tariff in 2010			Land Cost Burden by BOT				FIRR (%)						
								With Land Dev.			Without Land Dev.			
	Rp. 350 per PCU-km	Rp. 450 per PCU-km	Rp. 550 per PCU-km	100%	75%	50%	0%	Toll: 1-14 *1)		Toll: 1-17 *2)	Toll: 1-17 *3)	Toll: 1-14 *3)	Toll: 1-10 *3)	Toll: 11-14 *3)
									Land: Developer					
Annual tariff increase: 0%	✓			✓				7.0	7.1	5.3	4.8	6.3	6.3	5.2
		✓		✓				8.9	9.0	7.0	6.6	8.1	8.1	6.9
			✓	✓				9.7	9.8	7.9	7.4	8.8	8.8	7.6
Annual tariff increase: 3%	✓			✓				10.9	11.0	9.4	9.0	10.0	10.0	9.6
	✓				✓			11.6	-	10.0	9.6	10.7	10.7	10.1
	✓					✓		12.4	-	10.7	10.2	11.5	11.5	10.7
	✓						✓	14.7	-	12.5	11.9	13.7	13.7	12.2
		✓		✓				12.7	12.8	11.3	10.8	11.8	11.8	11.3
		✓			✓			13.5	-	11.9	11.4	12.5	12.5	11.9
		✓				✓		14.5	-	12.7	12.2	13.4	13.4	12.5
		✓					✓	17.2	-	15.0	14.3	16.1	16.1	14.2
			✓	✓				13.5	13.6	12.1	11.6	12.5	12.5	12.1
			✓		✓			14.4	-	12.8	12.3	13.4	13.4	12.7
			✓			✓		15.4	-	13.7	13.1	14.3	14.3	13.4
			✓				✓	18.4	-	16.1	15.3	17.1	17.1	15.1
Annual tariff increase: 5%	✓			✓				13.3	13.4	12.1	11.7	12.4	12.4	12.5
		✓		✓				15.2	15.3	13.9	13.5	14.2	14.2	14.2
			✓	✓				16.0	16.1	14.8	14.3	15.0	15.0	15.0
Annual tariff increase: 7%	✓			✓				15.7	15.8	14.6	14.2	14.7	14.7	15.2
		✓		✓				17.7	17.7	16.6	16.1	16.5	16.5	17.0
			✓	✓				18.5	18.6	17.4	16.9	17.3	17.3	17.8

The results of FIRR analysis in Table 5.1.6 reveal the following:

The FIRR shows the highest rate at 18.6% under the following assumptions:

- Toll section: Section 1 ~ 14 (Length: 80.6 km or 75% of the total length of 108.2 km)

- Traffic volume with land development scenario along 2nd JORR
- Tariff: Rp. 500 per PCU-km in 2010 at 2003 constant prices and annual increase of tariff by 7% after 2010

Meanwhile increase in toll tariff rate is the most crucial factor for the profitability of 2nd JORR. In cases under the assumption with annual real growth rate at 7%, the FIRR is rather high and it is higher than 15% in most cases. However, considering the toll users viewpoint, the increase of toll tariff by 7% will not be acceptable as the average growth rate of income per capita is estimated at 5.9%.

On the other hand, in case of growth rate at less than 3%, it is impossible for the private investor to provide toll services if the government will not provide the land.

If the government is unable to provide land for the construction of 2nd JORR, it is indispensable to increase the toll tariff appropriately for the private initiative development. It is required that annual increase rate will be more than 5% at the minimum.

5.10 TOWARD IMPLEMENTATION

5.10.1 Viability Perspective

(1) Factors to keep Viability

There are several important factors to discuss the financial viability of 2nd JORR. Such are listed as follows:

- Project cost
- Tariff and raising
- Traffic characteristics
- Burden of land cost
- Area development

(2) Project Cost

The project cost to construct 2nd JORR is estimated at around Rp. 7,000 Billion including land acquisition cost. This cost cannot be drastically reduced even in the future because low-cost embanking cross section is applied to lower the total cost in the estimates. In other words, this is basic and unchangeable conditions to analyze the viability.

(3) Initial Toll Rate and Tariff-Raise

The toll rate has been kept low for a long time under the policy not to raise consumer prices and to strive to keep the stability of the people's livelihood. Although Rp.350 /km had been applied as toll rate for a long time in Indonesia, Jasa Marga currently reviewed the toll tariff based on a new toll rate in the neighborhood of Rp. 400 /km. Initial tariff has important meaning to discuss financial viability of 2nd JORR. In addition, tariff-raise based on the real growth such as GDP per capita becomes also inevitable to secure the viability as well. Considering that the first part of 2nd JORR is assumed to be opened to the public in 2010, at least the toll rate of 500 Rp. / km is one of minimum conditions to maintain viability. In addition, real growth of per capita in Jabodetabek is estimated at as high as around 5.9%. This leads to the conclusion that 5% of annual tariff-raise is also one of the basic conditions for toll business in Jabodetabek.

1) Traffic Characteristics

The section between Merak Toll Road and Jagorawi Toll Road has the largest traffic volume on planned 2nd JORR. However, traffic flow on 2nd JORR shows a different pattern by major section. There are four existing toll roads between Cengkareng Access Road (start) and the EAST JORR (end); Merak Toll Road, Serpong Toll Road, Jagorawi Toll Road and Cikampek Toll Road. It can be said that not so much traffic passes through beyond the existing toll. In other words, although 2nd JORR is contributing to sub-regional development scenario, traffic flow itself is using 2nd JORR as an approach access to the existing toll roads. Specifically, the traffic passing through beyond Cikampek Toll Road is very small. This means 2nd JORR can be divided by the existing toll roads into five major sections from the viewpoint of viability analysis.

2) Burden of Land Cost

According to the current regulation, land cost of toll road has been appropriated by Kimpraswil. However, decentralization climates make it difficult to prepare the necessary land acquisition cost anymore. On the other hand, the local government also cannot afford to provide necessary budget for the land acquisition cost due to scarce resources at this moment. These facts lead to the fact that private investors have to shoulder the land cost in toll business. Based on the cost estimates in the Study, the land cost reaches around 30% of the total project cost. This means that past toll business conditions, which have been applied in Indonesia for a long time, have to be dramatically changed to meet viability. Otherwise, any private investors will not participate in the toll business due to high risk with low return. In the worst case, they may face the same situations in 1997; economic crisis era again.

(4) Integration with Area Development

1) Implication of Integration

Two facts usually become obstacles to discuss the viability of the toll road; one is to keep necessary traffic and another is problems on land acquisition. The section between Jagorawi Toll Road and Cikampek has small traffic. As the unit project cost of this section is lower than the other, FIRR is kept comparatively high though traffic volume is small. However, when considering future risk such as price inflation, further fertile conditions are required to ensure the implementation. Area development along this section will satisfy the insufficiency mentioned above. If there is area development between Siliwangi and Setu intersections is introduced, more traffic can be expected. N addition, part of land for toll road will also be secured if a pertinent procedure is adapted in taking advantage of the way of returning-development-benefits.

2) Policy of Integration

Average land use allocation in large-scale area development in Indonesia is as follows:

Table 5.10.1 Average Land Use Allocation in Large-scale Development

Item	Ratio	
For Selling	60%	
Public Space	40%	
Road		20%
School & others		7%
Green Space		5%
Cemetery		2%
Others		6%

On the other hand, necessary land for 2nd JORR within the area development is estimated as follows:

Table 5.10.2 Required Land for 2nd JORR

Location	Dev. Size (ha)	Average Road Space	2nd JORR				Ratio for 2nd JORR
			Length	Space	Interchange Space	Total Space	
		20%	(km)	(ha)	(ha)	(ha)	
Siliwangi	1000	200	5.5	22	10	32	3.2%
Setu	1000	200	4	16	10	26	2.6%

This reveals that additional 3% of the total development area is required to secure the land for 2nd JORR. Basic policy of integration is to burden the land developer with this additional toll road area.

3) Justification of Burden of Land

The analysis held in the previous "article (4) and (5) section 5.5.1," revealed that area developers can expect, to a large extent, the benefits from area development along 2nd JORR by taking the most use of new toll road, 2nd JORR. Land price is expected to be hiked up to around a maximum 10 times comparing to that of current land prices after the completion of toll road. This rise in land price can cover a large portion of construction cost of area development. Considering these facts, it can be easily justified to burden the area developers with additional cost of around 3% of total land.

5.10.2 Issues on Planning and Implementation

Issues on planning and implementation of the project are summarized as follows:

(1) Implementation Body to Manage Private Investor

On the premise that the section between Cengkareng Access Road and Cikampek Toll Road (around 80 km) will be constructed as the toll road, it is problematic for the related local governments to take the initiative with a view to managing all the procedures and steps necessary to construct the toll road, because all the related local governments have not much experience on such a big project so far. JTA (Jabodetabek Transportation Authority), which has been proposed in SITRAMP, has to manage the project. Furthermore, it is also problematic for the private investors to take a certain section independently. All related investors have to be united as a consortium to address implementation not only for profitable sections but also for lean sections as a matter of equity.

(2) Preconditions for Viability

Although toll raise was recently permitted, toll tariff had been left low for a long time in Indonesia and the governmental permission is required to raise the toll rate. Toll road is materialized by toll revenue. Setting up of initial toll tariff within the user's benefits and future raise of toll rate within real growth of GDP per capita become a precondition to materialize toll road business.

(3) Integration with Area Development

Although the large-scale area development itself has a difficulty to implement, the following issues can be listed to ensure the implementation:

- It is necessary to stipulate the planning principle and boundary of the area development project in a local spatial plan. This will prevent small size of uncontrollable area development.

- It is preferable, if possible, for one investor to take responsibility for the implementation of area development project. In case plural investors, however, participate in the project, it is necessary for all the related investors to bear the land cost of toll road as an investor responsible for within the designated area development, regardless if the area is beside or far from the 2nd JORR.

- It is also easily supposed that some land speculation may happen in association with area development. In terms of land buying/selling within the designated area on the local spatial plan, it is strongly necessary for the local government to manage the land price – not to hike it up – by applying a regulation to obtain permission to buy/sell land.

- As the large-scale area development is required, it is necessary to provide land use in the development to offer job opportunity. In addition, some public transportation facility development will be required such as extension of busway from Bekasi through Jl. Siliwangi, which is proposed in SITRAMP or new rail-based system to connect Bekasi Line to the area development along 2nd JORR.

5.11 RECOMMENDATIONS AND CONCLUSIONS

(1) Sub-center Development Scenario

As explained in SITRAMP, it is obvious that fulfillment of sub-center development scenario is a key to success to challenge traffic congestion in Jabodetabek region. In this context, 2nd JORR is expected to play an important role to connect between promising urban centers located in the outskirts of DKI Jakarta. It is strongly required to construct all the sections between Cengkareng Access Road and Cikampek Toll Road.

(2) Ensuring Viability

Private participation is expected to implement this project. Ensuring viability for toll business is required. For this end, adoption of pertinent toll rate and raising-toll system to meet real growth of GDP per capita is a basic condition. Reasonable tariff raise should be justified in place of price restraint for the long perspective of forthcoming Indonesian economy.

Furthermore, it is revealed in the course of the Study that the completion between Jagorawi Toll Road and Cikampek Toll Road is important to fulfill sub-center development though much traffic is not projected. In this context, area development has to be introduced to secure necessary traffic and land for the toll road. These will contribute to a better financial viability for 2nd JORR.

(3) Implementation Body

Local government has to play an important role to crystallize the project. It is strongly necessary to stipulate the project in the local spatial plan as well as to include area development between Siliwangi and Setu interchanges. Close cooperation between the local governments is required.

Another important subject is management body. Completion of easy section is meaningless. Completion of all the sections is a key of this project that will open up wider opportunities. Economic crisis revealed that toll business was risky and not an easy field. In this view, although this is mentioned in the current regulation, participation of PT. Jasa Marga in this project is strongly required to a large extent.

(4) Others

A toll road needs establishment of well-arranged access roads to distribute traffic flow to surrounding areas. SITRAMP proposed future road network to meet traffic demand and urbanization. The local government has to undertake the responsibility for the establishment of access road network as well as 2nd JORR. In some cases, land readjustment method may be useful to construct the access road to the interchanges.

Lastly, this Study proposed the large-scale area development near Siliwangi and Setu interchanges. The traffic generated from this area will be huge. Extension of busway between Jakarta and Setu, which was proposed in SITRAMP, may become necessary. Furthermore, rail-based system to connect the area to Bekasi railway station may also be required in the future. Necessary studies and discussions are of importance from time to time to meet the progress of the project.