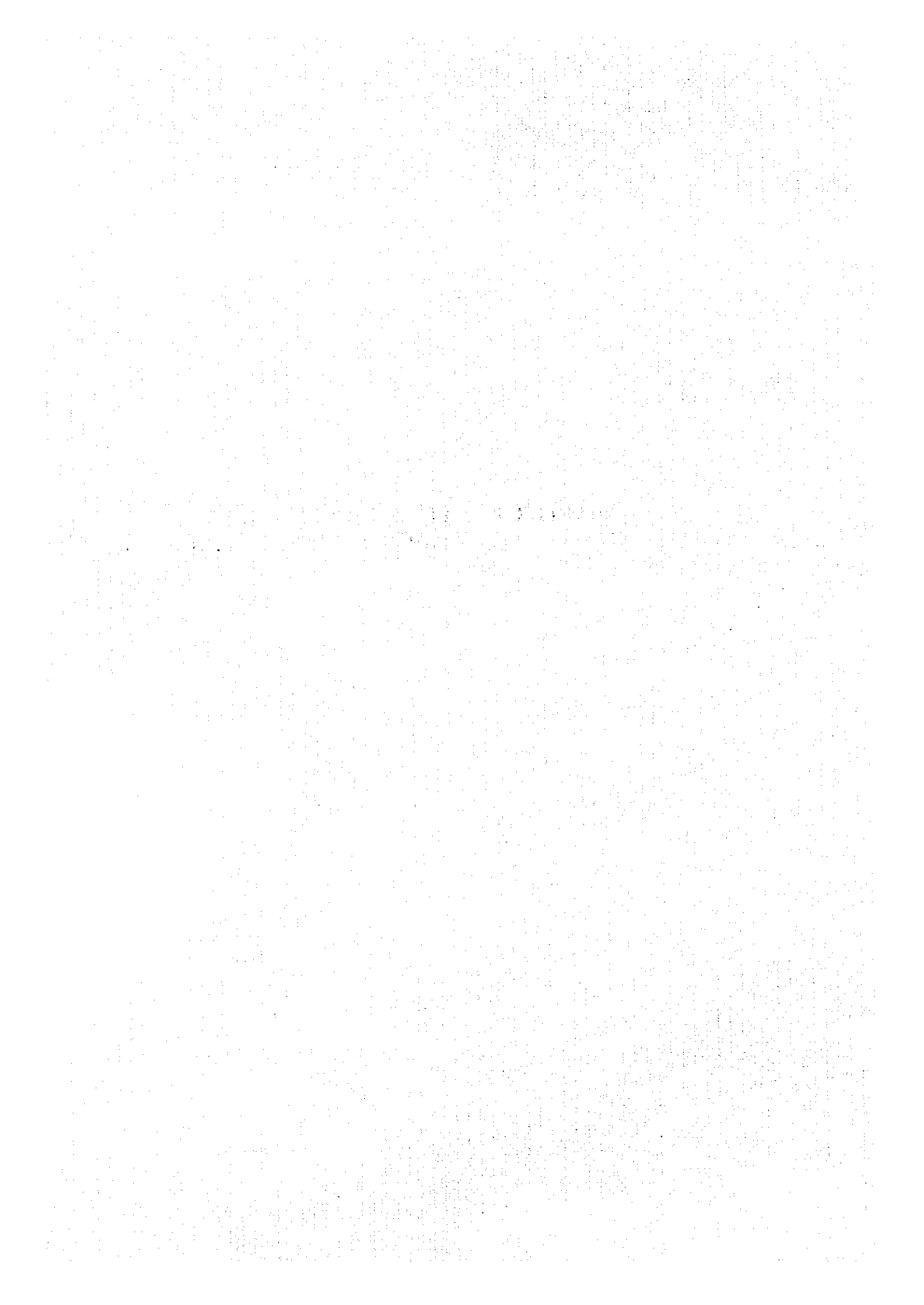


**CHAPTER 8    FUND SOURCES AND  
IMPLEMENTATION PROGRAM**



## CHAPTER 8

### FUND SOURCES AND IMPLEMENTATION PROGRAM

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#### 8.1 Fund Source Analysis

##### 8.1.1 Availability of Fund and Fund Source

###### (1) Funding Structure of Road Development Budget

###### 1) Funding Structure

###### a. General

Figure 7.3.1 shows a schematic summary of the funding structure for road development in Indonesia. The funding sources for road development in Indonesia comprise three sources; namely, APBN, APBD Dati I and APBD Dati II.

APBN (Anggaran Pendapatan dan Belanja Negara) stands for the National Revenue and Expenditure Budget. The revenue of APBN is composed of Central Government Revenue and Foreign Loans.

APBD Dati I (Anggaran Pendapatan dan Belanja Daerah Tingkat I) stands for the Regional Revenue and Expenditure Budget at Provincial Level, and APBD Dati II (Anggaran Pendapatan dan Belanja Daerah Tingkat II) stands for the Regional Revenue and Expenditure Budget at Kabupaten (District) / Kotamadya (Municipal) Level.

Other funds required for the construction, operation and maintenance of toll road facilities are those consisting of private investment and toll revenues.

###### b. APBN

The component of APBN related to road development is mainly divided into three; namely, APBN Murni, IPJP and IPJK.

APBN Murni (pure APBN) is the funds used for National Road projects. That is, National Road projects are financed merely by the fund originated from the APBN budget.

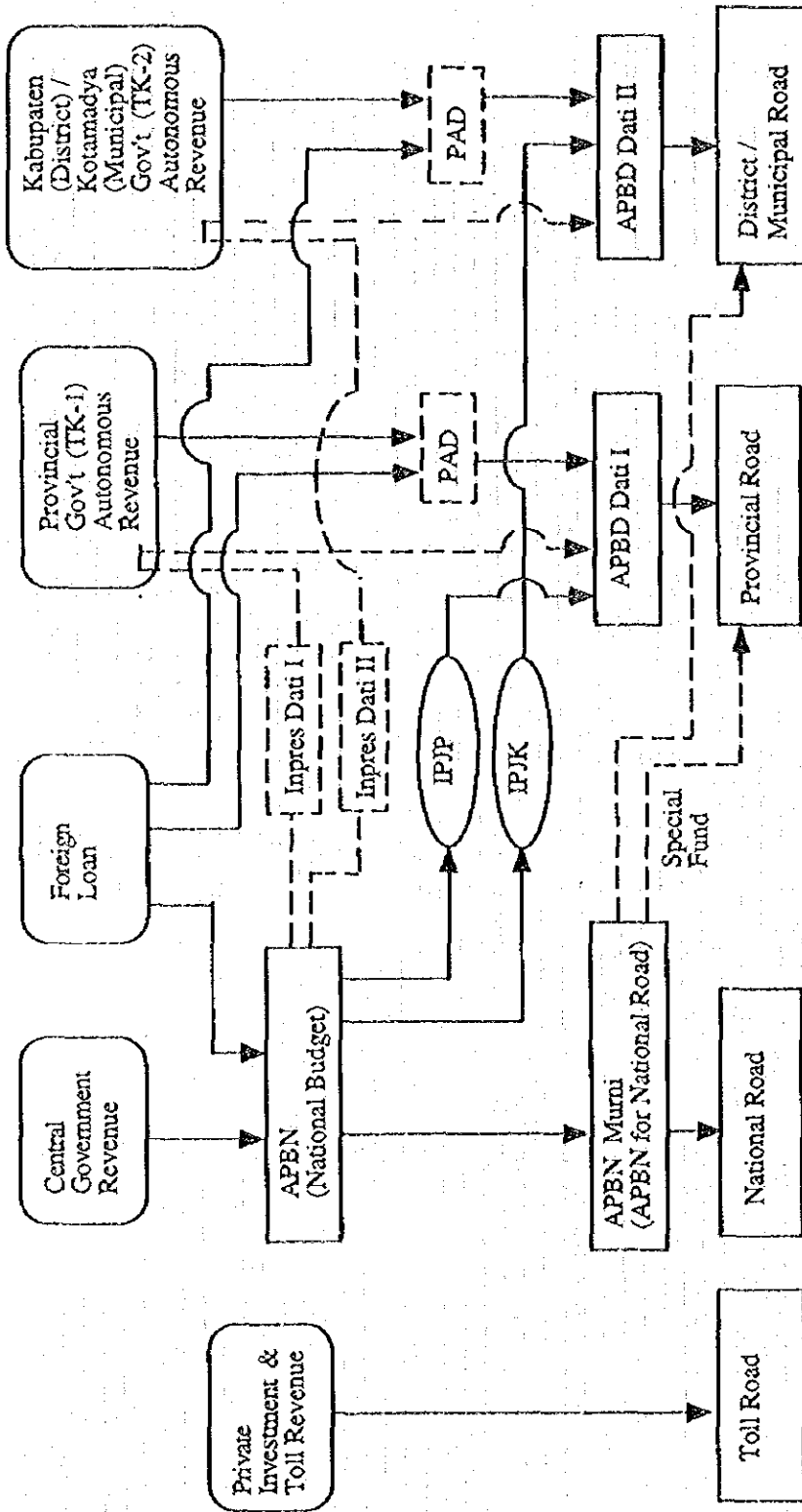


Figure 8.1.1 General Flow of Funding Structure for Road Development in Indonesia

Source: Compiled by JICA Study Team based on the "Roads in Indonesia 1995 (Bina Marga)" and the hearing at the Bina Marga, DPU, JATIM.

Note: 1) APBN: Anggaran Pendapatan dan Belanja Negara (National Revenue and Expenditure Budget)

2) IPJP: Inpres Peningkatan Jalan Propinsi (Assistance for Provincial Road Betterment)

3) IPJK: Inpres Peningkatan Jalan Kabupaten/Kotamadya (Assistance for Kabupaten/Kotamadya Road Betterment)

4) APBD Dati I : Anggaran Pendapatan dan Belanja Daerah Tingkat I (Regional Revenue and Expenditure Budget at Provincial Level)

5) APBD Dati II : Anggaran Pendapatan dan Belanja Daerah Tingkat II (Regional Budget at Kabupaten/Kotamadya Level)

6) Inpres Dati I : Inpres Daerah Tingkat I (Assistance for Provincial Road Maintenance Financed by Central Government through Regional Government)

7) Inpres Dati II : Inpres Daerah Tingkat II (Assistance for Kabupaten/Kotamadya Road Maintenance Financed by Central Government through Regional Government)

8) PAD: Pendapatan Asli Daerah (Original Revenue of Regional Government)

The IPJP (Inpres Peningkatan Jalan Propinsi, (Inpres: Instruksi Presiden)) means the financial assistance for Provincial Road Betterment by the Central Government. The IPJK (Inpres Peningkatan Jalan Kabupaten / Kotamadya) means the financial assistance for Kabupaten / Kotamadya Road Betterment by the Central Government.

(Besides the above, as a part of the APBN budget, there are Inpres Dati I and Inpres Dati II (Inpres Daerah Tingkat I and II), which are defined as the financial assistance for Provincial Road Rehabilitation/Maintenance and the financial assistance for Kabupaten (District) / Kotamadya (Municipal) Road Rehabilitation/Maintenance financed by the Central Government through the Regional Government).

#### c. APBD Dati I

APBD Dati I (the Regional Revenue and Expenditure Budget at Provincial Level) comprises three components; namely, IPJP, Inpres Dati I and PAD.

PAD (Pendapatan Asli Daerah) means the original revenue of Regional Government, which is composed of the two factors of the autonomous revenue of Regional Government and foreign loan.

In the case of APBD Dati I, it is composed of the autonomous revenue of Provincial Government and foreign loan.

The fund of IPJP is used for Provincial Road Betterment. The use of Inpres Dati I is for Provincial Road Rehabilitation/Maintenance. The fund of PAD is allocated for Provincial Road Betterment and Rehabilitation/Maintenance. According to an interview at the office of Bina Marga, DPU, JATIM, the fund of PAD includes Betterment, which means widening on a small-scale.

For new development of Provincial Road, there is a Special Fund originated from the fund of APBN. However, in this case, the purpose of new Provincial Road development is limited to the connecting roads related to "industrial area", "seaport", "tourism points", etc.

#### d. APBD Dati II

Similar to APBD Dati I, APBD Dati II (the Regional Revenue and Expenditure Budget at Kabupaten / Kotamadya Level) comprises three components; namely, IPJK, Inpres Dati II and PAD.

In this case, PAD is composed of the two factors of the autonomous revenue of Kabupaten / Kotamadya Government and foreign loan.

The usage of the funds of IPJK, Inpres Dati II and PAD are similar to the above cases of APBD Dati I, respectively.

### 2) APBN

Table 8.1.1 show a summary of the national road development budget in APBN for the whole of Indonesia in the period of REPELITA VI (Sixth Five Year Development Plan). In the total of five years, the total road budget in APBN amounts to 22,195 billion Rupiah, which is equivalent to about 4,400 billion Rupiah average per annum.

As for the share portion of Rupiah (central government revenue) / foreign loan, the share percentage of central government revenue is about 80%, while that of foreign loan is about 20%. Regarding the share portion by component, about 55% in the APBN total is distributed to "APBN Murni", and 45% is allocated to "IPJP" (15%) and "IPJK" (30%).

For the period in REPELITA VI, the annual average growth ratio during 1994/95 - 1998/99 is about 9.0% for the total amount. Among the three components, the annual average growth ratio of "IPJP" is rather higher (about 15%), followed by APBN Murni (about 9%).

### 3) APBN Allocated to East Java Province (JATIM)

Table 8.1.2 shows a summary of the national road development budget in APBN allocated to the Province of East Java in the period of REPELITA V and REPELITA VI (Fifth and Sixth Five Year Development Plan).

#### a. REPELITA V

In the period of REPELITA V, the total road budget of APBN allocated to East Java Province amounts to about 414 billion Rupiah. The share ratio by work type is about 25%, 75% and 0% (not null, but almost 0%) for "rehabilitation/maintenance", "betterment" and "development", respectively. The weight of "betterment" is high, while no portion is for "development". The share ratio by fund currency type is about 67% and 33% for "national revenue" and "foreign loan" respectively.

#### b. REPELITA VI

In the period of REPELITA VI, the total road budget of APBN allocated to East Java Province amounts to about 1,140 billion Rupiah.

The share ratio by work type is about 11%, 54% and 35% for "rehabilitation/ maintenance", "betterment" and "development", respectively. The weight of "betterment" is high. Compared with REPELITA V, the share ratio of "development" increased dramatically.

The share ratio by fund currency type is about 87% and 13% for "national revenue" and "foreign loan" respectively. Compared with REPELITA V the share ratio of "foreign loan" decreases and the share ratio of "national revenue" increases. The total amount of "foreign loan" from REPELITA V to REPELITA VI shows a small increase. The weight of "foreign loan" changes to small.

#### c. Growth Ratio Between REPELITA V and REPELITA VI

The growth ratio between REPELITA V and REPELITA VI in terms of the total of five years is about 2.8 times in the total amount, which is equivalent to an average annual growth ratio of about 22%. In terms of the work type, while the growth ratio of "rehabilitation/ maintenance" and "betterment" are about 1.3 and 2.0 times respectively, "development" shows a dramatic increase. This is because of the implementation of several national road development projects of widening (recent / on-going).

The following are representative samples of the projects:

- ♦ Gempol - Malang
- ♦ Sidoarjo - Gempol (On-going)
- ♦ Gempol - Pasuruan (On-going)

## ♦ Gresik - Babat (Planned)

## d. Estimation of Share Ratio of APBN Allocated to East Java Province to Total APBN

Through a comparison between Table 8.1.1 and Table 8.1.2, the share ratio of APBN allocated to East Java Province to the total APBN is estimated regarding the total amount in the period of REPELITA VI. For the period of REPELITA VI, the share ratio is estimated to be about 9%. This probably reflect the dramatic increase in the total amount of five years for REPELITA VI compared with REPELITA V (about 2.8 times).

**Table 8.1.1 Summary of National Road Development Budget in APBN for Whole Indonesia in REPELITA VI**

PELITA VI		Component of APBN				APBN Total	Remarks
		(1) APBN Murni	(2) IPJP	(3) IPJK			
1994/95	(1) Rupiah	1,560	405	967	2,932		
	(2) Foreign Loan	578	110	264	952		
	(Total)	(2,138)	(515)	(1,231)	(3,884)		
1995/96	(1) Rupiah	1,670	431	997	3,098		
	(2) Foreign Loan	456	94	165	715		
	(Total)	(2,126)	(525)	(1,162)	(3,813)		
1996/97	(1) Rupiah	1,618	513	1,177	3,308		
	(2) Foreign Loan	424	29	147	600		
	(Total)	(2,042)	(542)	(1,324)	(3,908)		
1997/98	(1) Rupiah	2,248	564	1,295	4,107		
	(2) Foreign Loan	601	260	145	1,006		
	(Total)	(2,849)	(824)	(1,440)	(5,113)		
1998/99	(1) Rupiah	2,473	621	1,424	4,518		
	(2) Foreign Loan	534	276	149	959		
	(Total)	(3,007)	(897)	(1,573)	(5,477)		
Total of Five Years	(1) Rupiah	9,569	2,534	5,860	17,963		
	(2) Foreign Loan	2,593	769	870	4,232		
	(Total)	(12,162)	(3,303)	(6,730)	(22,195)		

Share Portion in Total of Five Years (By Rupiah / Foreign Loan)						
Total of Five Years	(1) Rupiah	78.7%	76.7%	87.1%	80.9%	
	(2) Foreign Loan	21.3%	23.3%	12.9%	19.1%	
	(Total)	100.0%	100.0%	100.0%	100.0%	
Share Portion in Total of Five Years (By Component)						
Total of Five Years	(1) Rupiah	53.3%	14.1%	37.6%	100.0%	
	(2) Foreign Loan	61.3%	18.2%	20.6%	100.0%	
	(Total)	54.8%	14.9%	30.3%	100.0%	

Annual Average Growth Ratio During 1994/95 - 1998/99						
	(1) Rupiah	-	-	-	11.4%	
	(2) Foreign Loan	-	-	-	0.2%	
	(Total)	8.9%	14.9%	6.3%	9.0%	

Source: BIPRAN, Bina Marga.

Note : 1) Rupiah : Central Government Revenue

2) "Inpres Dati I" and "Inpres Dati II" are not included.

**Table 8.1.2 APBN for National Road Allocated to Province of East Java in REPELITA V and REPELITA VI**

(Allocated to JATIM (Province of East Java) for National Road in APBN)

(Million Rp.)

PELITA V		Fund of APBN for National Road (Portion of JATIM)			Remarks
		National Revenue	Foreign Loan	APBN Total	
1989/90	(1) Rehabilitation/Maintenance	5,475	3,654	9,129	Actual
	(2) Betterment	10,909	25,209	36,118	
	(3) Development	0	0	0	
	(Total)	(16,384)	(28,863)	(45,247)	
1990/91	(1) Rehabilitation/Maintenance	7,502	2,292	9,794	Actual
	(2) Betterment	28,046	11,574	39,620	
	(3) Development	0	0	0	
	(Total)	(35,548)	(13,866)	(49,414)	
1991/92	(1) Rehabilitation/Maintenance	7,592	6,605	14,197	Actual
	(2) Betterment	56,668	5,314	61,982	
	(3) Development	0	0	0	
	(Total)	(64,260)	(11,919)	(76,179)	
1992/93	(1) Rehabilitation/Maintenance	20,001	26,039	46,040	Actual
	(2) Betterment	56,433	13,490	69,923	
	(3) Development	0	0	0	
	(Total)	(76,434)	(39,529)	(115,963)	
1993/94	(1) Rehabilitation/Maintenance	20,739	1,780	22,519	Actual
	(2) Betterment	64,998	39,016	104,014	
	(3) Development	889	0	889	
	(Total)	(86,626)	(40,796)	(127,422)	
Total of of Five Years	(1) Rehabilitation/Maintenance	61,309	40,370	101,679	Actual
	(2) Betterment	217,054	94,603	311,657	
	(3) Development	889	0	889	
	(Total)	(279,252)	(134,973)	(414,225)	

Share Portion in Total of Five Years (By Work Type)					
Total of of Five Years	(1) Rehabilitation/Maintenance	22.0%	29.9%	24.5%	
	(2) Betterment	77.7%	70.1%	75.2%	
	(3) Development	0.3%	0.0%	0.2%	
	(Total)	100.0%	100.0%	100.0%	
Share Portion in Total of Five Years (By National Revenue / Foreign Loan)					
Total of of Five Years	(1) Rehabilitation/Maintenance	60.3%	39.7%	100.0%	
	(2) Betterment	69.6%	30.4%	100.0%	
	(3) Development	100.0%	0.0%	100.0%	
	(Total)	67.4%	32.6%	100.0%	

Source: BIPRAN, Bina Marga.



**Table 8.1.2 APBN for National Road Allocated to Province of East Java in REPELITA V and REPELITA VI (Continued)**

(Allocated to JATIM (Province of East Java) for National Road in APBN)

(Million Rp.)

PELITA VI		Fund of APBN for National Road (Portion of JATIM)			Remarks
		National Revenue	Foreign Loan	APBN Total	
1994/95	(1) Rehabilitation/Maintenance	19,910	2,835	22,745	Actual
	(2) Betterment	26,468	42,691	69,159	
	(3) Development	39,202	9,761	48,963	
	(Total)	(85,580)	(55,287)	(140,867)	
1995/96	(1) Rehabilitation/Maintenance	20,475	2,770	23,245	Actual
	(2) Betterment	28,174	18,742	46,916	
	(3) Development	36,351	11,595	47,946	
	(Total)	(85,000)	(33,107)	(118,107)	
1996/97	(1) Rehabilitation/Maintenance	17,949	666	18,615	Planned
	(2) Betterment	37,834	12,446	50,280	
	(3) Development	27,297	9,433	36,730	
	(Total)	(83,080)	(22,545)	(105,625)	
1997/98	(1) Rehabilitation/Maintenance	28,150		28,150	Planned
	(2) Betterment	108,505	14,505	123,010	
	(3) Development	51,492	17,662	69,154	
	(Total)	(188,147)	(32,167)	(220,314)	
1998/99	(1) Rehabilitation/Maintenance	34,451		34,451	Planned
	(2) Betterment	324,373		324,373	
	(3) Development	195,978		195,978	
	(Total)	(554,802)	(0)	(554,802)	
Total of Five Years	(1) Rehabilitation/Maintenance	120,935	6,271	127,206	
	(2) Betterment	525,354	88,384	613,738	
	(3) Development	350,320	48,451	398,771	
	(Total)	(996,609)	(143,106)	(1,139,715)	

Share Portion in Total of Five Years (By Work Type)				
Total of Five Years	(1) Rehabilitation/Maintenance	12.1%	4.4%	11.2%
	(2) Betterment	52.7%	61.8%	53.9%
	(3) Development	35.2%	33.9%	35.0%
	(Total)	100.0%	100.0%	100.0%
Share Portion in Total of Five Years (By National Revenue / Foreign Loan)				
Total of Five Years	(1) Rehabilitation/Maintenance	95.1%	4.9%	100.0%
	(2) Betterment	85.6%	14.4%	100.0%
	(3) Development	87.8%	12.2%	100.0%
	(Total)	87.4%	12.6%	100.0%

Growth Ratio between PELITA V and PELITA VI				
Total of Five Years	(1) Rehabilitation/Maintenance	1.97	0.16	1.25
	(2) Betterment	2.42	0.93	1.97
	(3) Development	394.06	-	418.56
	(Total)	3.57	1.06	2.75

Annual Average Growth Ratio (%) between PELITA V and PELITA VI				
Total of Five Years	(1) Rehabilitation/Maintenance	14.6%	-	4.6%
	(2) Betterment	19.3%	-	14.5%
	(3) Development	230.5%	-	239.1%
	(Total)	29.0%	1.2%	22.4%

Source: Bina Marga, DPUD JATIM (Bina Marga, Dinas Pekerjaan Umum Daerah Jawa Timur)

Note: Development : including "New Construction" and "Widening".

## 4) APBD Dati I Related to East Java Province

Table 8.1.3 shows a summary of the APBD Dati I fund for Provincial Road development related to East Java Province for the period of REPELITA V and REPELITA VI.

**Table 8.1.3 Allocation of APBD Dati I Fund for Provincial Road Development of East Java Province in REPELITA V and REPELITA VI**

(APBD : Regional Revenue and Expenditure Budget)

PELITA V		(Million Rp.)				Remarks
		(1) IPJP	(2) Inpres Dati I	(3) PAD	APBD Total	
1989/90	(1) Rupiah	2,882	3,146	12,648	18,676	Actual
	(2) Foreign Loan	0	425	17,385	17,810	
	(Total)	(2,882)	(3,571)	(30,033)	(36,486)	
1990/91	(1) Rupiah	10,822	3,500	13,925	28,247	Actual
	(2) Foreign Loan	6,202	0	15,096	21,298	
	(Total)	(17,024)	(3,500)	(29,021)	(49,545)	
1991/92	(1) Rupiah	14,069	5,350	18,773	38,192	Actual
	(2) Foreign Loan	2,208	0	28,499	30,707	
	(Total)	(16,277)	(5,350)	(47,272)	(68,899)	
1992/93	(1) Rupiah	14,069	6,825	19,235	40,129	Actual
	(2) Foreign Loan	1,177	0	12,517	13,694	
	(Total)	(15,246)	(6,825)	(31,752)	(53,823)	
1993/94	(1) Rupiah	16,124	7,236	15,067	38,427	Actual
	(2) Foreign Loan	4,461	0	1,168	5,629	
	(Total)	(20,585)	(7,236)	(16,235)	(44,056)	
Total of Five Years	(1) Rupiah	57,966	26,057	79,648	163,671	Actual
	(2) Foreign Loan	14,048	425	74,665	89,138	
	(Total)	(72,014)	(26,482)	(154,313)	(252,809)	

Share Portion in Total of Five Years (By Rupiah / Foreign Loan)						
Total of Five Years	(1) Rupiah	80.5%	98.4%	51.6%	64.7%	
	(2) Foreign Loan	19.5%	1.6%	48.4%	35.3%	
	(Total)	100.0%	100.0%	100.0%	100.0%	

Share Portion in Total of Five Years (By Component)						
Total of Five Years	(1) Rupiah	35.4%	15.9%	48.7%	100.0%	
	(2) Foreign Loan	15.8%	0.5%	83.8%	100.0%	
	(Total)	28.5%	10.5%	61.0%	100.0%	

Source: Bina Marga, DPIID IATIM (Bina Marga, Dinas Pekerjaan Umum Daerah Jawa Timur)

**Table 8.1.3 Allocation of APBD Dati I Fund for Provincial Road Development of East Java Province in REPELITA V and REPELITA VI (Continued)**

(APBD : Regional Revenue and Expenditure Budget)

(Million Rp.)

PELITA VI		(1) IPJP	(2) Inpres Dati I	(3) PAD	APBD Total	Remarks
1994/95	(1) Rupiah	13,519	5,211	17,810	36,540	Actual
	(2) Foreign Loan	4,949	0	0	4,949	
	(Total)	(18,468)	(5,211)	(17,810)	(41,489)	
1995/96	(1) Rupiah	13,417	5,211	21,827	40,455	Actual
	(2) Foreign Loan	0	0	1,755	1,755	
	(Total)	(13,417)	(5,211)	(23,582)	(42,210)	
1996/97	(1) Rupiah	14,345	5,211	19,738	39,294	Planned
	(2) Foreign Loan			6,320	6,320	
	(Total)	(14,345)	(5,211)	(26,058)	(45,614)	
1997/98	(1) Rupiah	34,530	8,500	36,850	79,880	Planned
	(2) Foreign Loan				0	
	(Total)	(34,530)	(8,500)	(36,850)	(79,880)	
1998/99	(1) Rupiah	39,000	12,500	36,100	87,600	Planned
	(2) Foreign Loan				0	
	(Total)	(39,000)	(12,500)	(36,100)	(87,600)	
Total	(1) Rupiah	114,811	36,633	132,325	283,769	
	(2) Foreign Loan	4,949	0	8,075	13,024	
	(Total)	(119,760)	(36,633)	(140,400)	(296,793)	

Share Portion in Total of Five Years (By Rupiah / Foreign Loan)						
Total of Five Years	(1) Rupiah	95.9%	100.0%	94.2%	95.6%	
	(2) Foreign Loan	4.1%	0.0%	5.8%	4.4%	
	(Total)	100.0%	100.0%	100.0%	100.0%	

Share Portion in Total of Five Years (By Component)						
Total of Five Years	(1) Rupiah	40.5%	12.9%	46.6%	100.0%	
	(2) Foreign Loan	38.0%	0.0%	62.0%	100.0%	
	(Total)	40.4%	12.3%	47.3%	100.0%	

Growth Ratio between PELITA V and PELITA VI						
Total of Five Years	(1) Rupiah	1.98	1.41	1.66	1.73	
	(2) Foreign Loan	0.35	-	0.11	0.15	
	(Total)	1.66	1.38	0.91	1.17	

Annual Average Growth Ratio (%) between PELITA V and PELITA VI						
Total of Five Years	(1) Rupiah	14.6%	7.1%	10.7%	11.6%	
	(2) Foreign Loan	-	-	-	-	
	(Total)	10.7%	6.7%	-	3.3%	

Source: Bina Marga, DPUD JATIM (Bina Marga, Dinas Pekerjaan Umum Daerah Jawa Timur)

a. REPELITA V

In the period of REPELITA V, the total road development budget in APBD Dati I related to East Java Province amounts to about 253 billion Rupiah.

The share ratio by component is roughly 30%, 10% and 60% for "IPJP", "Inpres Dati I" and "PAD", respectively. PAD occupies the dominant portion. The share ratio by fund currency type is about 65% and 35% for "Rupiah (provincial government revenue)" and "foreign loan", respectively. It is noted that while the shares of Rupiah in "IPJP" and "Inpres Dati I" are dominant, the share of foreign loan occupies a rather high share (almost half) in "PAD".

b. REPELITA VI

In the period of REPELITA VI, the total road development budget in APBD Dati I related to East Java Province amounts to about 297 billion Rupiah.

The share ratio by component is roughly 40%, 10% and 50% for "IPJP", "Inpres Dati I" and "PAD", respectively. PAD occupies the dominant portion, however its share has decreased compared with that in REPELITA V (from 60% to 50%).

c. Growth Ratio Between REPELITA V and REPELITA VI

The growth ratio between REPELITA V and REPELITA VI in terms of the total of five years is about 1.2 times in the total amount, which is equivalent to an average annual growth ratio of about 3%. In respect to components, while the growth ratio of IPJP is rather high, that of PAD shows a negative growth ratio.

d. Estimation of Share Ratio of APBN Related to East Java Province to Total APBN

Through a comparison between Table 8.1.1 and Table 8.1.3, the share ratio of IPJP related to East Java Province to the total IPJP is estimated regarding the total amount in the period of REPELITA VI. For the period of REPELITA VI, the share ratio is estimated to be about 4%.

(2) Availability of Funds for the Project

1) Assumption of Fund Source Related to the Project

a. Funding Scheme

Through the overview of the funding structure for road development as mentioned in the above section, the funding scheme is summarized as shown in Table 8.1.4.

b. Assumption of Funds Related to Project

Taking the characteristics of the Project into consideration, among the above funds, the funds related to the Project are assumed to be as shown in the column of Remarks in Table 8.1.4. (The "X" in the remarks column means "Related to the Project".)

**Table 8.1.4 Funding Scheme and Related Funds**

Road Classification	Fund	Remarks
1. National Road	(A) APBN Allocated to East Java Province	
	(a) Development	X
	(b) Betterment	X
2. Provincial Road	(B) APBD Dati I in East Java Province	
	(a) IPJP	X
	(b) Inpres Dati I	
	(c) PAD	

Source: Assumed by JICA Study Team

Note: Marking of "X" in Remarks means "Related to the Project".

## 2) Estimation of Availability of Funds Based on REPELITA VI

According to the data in REPELITA VI (refer to Table 8.1.2 and 8.1.3), the availability of related funding amounts for the whole East Java Province are as follows (in these amounts the portions of "foreign loan" are excluded for the sake of a conservative estimation) :

(1) For National Road Development	(Billion Rp.)
1) Component of "Development" in APBN Allocated to East Java Province	350
2) Component of "Betterment" in APBN Allocated to East Java Province	520
(2) For Provincial Road Development	(Billion Rp.)
1) Component of "IPJP" in APBD Dati I in East Java Province	110

Estimated by JICA Study Team

The above amounts are related to the whole East Java Province while the Project related area is the GKS region within the Province. It is considered difficult to estimate the share portion allocated to the GKS region out of the above amounts.

Consequently, the above amounts are to be reasonably understood as the maximum amounts to be allowed for the Project. The amounts to be allocated to the Project are duly a part of the above amounts.

## 3) Estimation of Availability of Funds up to REPELITA X (up to 2018)

### a) Assumption of Growth Ratio for Estimating Future Funding Amounts

For estimation of the future funding amounts, growth ratios are assumed.

Here, the annual growth ratios for estimation of the future funding amount are assumed in accordance with the GRDP growth ratio.

In accordance with the future target value of the annual growth ratios of GRDP in East Java Province (7% up to 2008 and 8% during 2008 - 2018), the annual growth ratios for estimation of the future funding amount are assumed, i.e. 7% up to 2008 and 8% during 2008 - 2018.

### b) Estimation of Availability of Funds

Table 8.1.5 shows a summary of the APBD Dati II fund for Municipal Road development

related to Surabaya Municipality for the period of REPELITA V. However, data are not available for the period of REPELITA VI, and the breakdown between "Rupiah" and "Foreign Loan" is not also available. Further examination/elaboration of the data to be collected is required. Although there are items to be examined further, an estimation of availability of funds has been made.

Table 8.1.6 shows the results of the estimation. For the "Surabaya Municipal Road", the total amount of the three types of fund source of "IPJK", "Inpres Dati II" and "PAD" is applied, and the annual average growth ratio for REPELITA VI is assumed to be the same for REPELITA VII.

**Table 8.1.5 Allocation of APBD Dati I Fund for Municipal Road Development of Surabaya Municipality in REPELITA V**

(APBD : Regional Revenue and Expenditure Budget)

PELITA V		(Million Rp.)				Remarks
		(1) IPJK	(2) Inpres Dati II	(3) PAD	APBD II Total	
1989/90	(1) Rupiah	-	-	-	-	Actual
	(2) Foreign Loan	-	-	-	-	
	(Total)	(600)	(4,058)	(31,311)	(35,969)	
1990/91	(1) Rupiah	-	-	-	-	Actual
	(2) Foreign Loan	-	-	-	-	
	(Total)	(995)	(5,256)	(40,302)	(46,553)	
1991/92	(1) Rupiah	-	-	-	-	Actual
	(2) Foreign Loan	-	-	-	-	
	(Total)	(2,000)	(7,766)	(50,426)	(60,192)	
1992/93	(1) Rupiah	-	-	-	-	Actual
	(2) Foreign Loan	-	-	-	-	
	(Total)	(2,239)	(16,182)	(55,603)	(74,024)	
1993/94	(1) Rupiah	-	-	-	-	Actual
	(2) Foreign Loan	-	-	-	-	
	(Total)	(2,676)	(12,972)	(64,130)	(79,778)	
Total of Five Years	(1) Rupiah	-	-	-	-	Actual
	(2) Foreign Loan	-	-	-	-	
	(Total)	(8,510)	(46,234)	(241,772)	(296,516)	

Share Portion in Total of Five Years (By Rupiah / Foreign Loan)

Total of Five Years	(1) Rupiah	-	-	-	-
	(2) Foreign Loan	-	-	-	-
	(Total)	-	-	-	-

Share Portion in Total of Five Years (By Component)

Total of Five Years	(1) Rupiah	-	-	-	-
	(2) Foreign Loan	-	-	-	-
	(Total)	2.9%	15.6%	81.5%	100.0%

Source: BAPPEDA, Kotamadya Surabaya

Table 8.1.6 Estimation of Availability of Future Funding Amounts

## (1) Assumption of Annual Average Growth Ratio

		PELITA Year	VI 94/95 - 98/99	VII 99/00 - 03/04	VIII 04/05 - 08/09	IX 09/10 - 13/14	X 14/15 - 18/19
<b>(a) For National Road</b>							
	1)	Component of "Development" in APBN Allocated to JATIM		7.0%	7.0%	8.0%	8.0%
	2)	Component of "Betterment" in APBN Allocated to JATIM		7.0%	7.0%	8.0%	8.0%
<b>(b) For Provincial Road</b>							
	1)	Component of "IPJP" in APBD Dati I		7.0%	7.0%	8.0%	8.0%
<b>(c) For Surabaya Municipal Road</b>							
		Total Amount in APBD Dati II	(7.0%)	7.0%	7.0%	8.0%	8.0%

## (2) Estimation of Availability of Future Funding Amount

(Billion Rp.)

		PELITA Year	VI 94/95 - 98/99	VII 99/00 - 03/04	VIII 04/05 - 08/09	IX 09/10 - 13/14	X 14/15 - 18/19
<b>(a) For National Road</b>							
	1)	Component of "Development" in APBN Allocated to JATIM	350	491	689	1,012	1,486
	2)	Component of "Betterment" in APBN Allocated to JATIM	520	729	1,023	1,503	2,208
<b>(b) For Provincial Road</b>							
	1)	Component of "IPJP" in APBD Dati I	110	154	216	318	467
<b>(c) For Surabaya Municipal Road</b>							
		Total Amount (Pelita V) in APBD Dati II	290	407	570	800	1,176
						1,176	1,727

Source: Estimated by JICA Study Team

Note: "For Surabaya Municipal Road"; the annual average growth ratio for the period of REPELITA VI is assumed to be the same for REPELITA VII.

### 8.1.2 Estimation of Future Availability of Funds

The government budget from domestic sources is estimated on a trend basis to be 10,296 billion Rupiah for national and provincial road development in East Java from Repelita VII and to Repelita X as presented in Table 8.1.7. Further, foreign loans for Road "Betterment" and "Development" categories account for 30.3% and 13.5% of the East Java APBN total (refer to Table 8.1.2) of Repelita V and VI respectively.

According to the sources from Bina Marga of the East Java Government the road budget allocated to the GKS region averages about 10% to 15% of the total Provincial budget.

Assuming that the foreign loan portion is 15% of the domestic road budget in East Java, and of which 15% is allocated to the GKS region, the total budget during Repelita VII through X is estimated to be 1,777 billion Rupiah for primary arterial and collector road development in the GKS region.

Generally, the road budget at municipal or regency level is mostly confined to road maintenance and rehabilitation but there are current road improvement/development projects by Surabaya Municipality using IBRD loan under SUDP program. Therefore, the road budget of Surabaya Municipality was used as a base to assume the coarse frame of the road development budget in GKS, as shown in Table 8.1.7.

**Table 8.1.7 Availability of Funds for JATIM and GKS**

		(Billion Rp.)				
Type of Roads	Fund Sources	VII	VIII	IX	X	TOTAL
National Road:	APBN-Development	491	689	1,012	1,486	3,678
	APBN-Betterment	729	1,023	1,503	2,208	5,463
Provincial Road	IPJP	154	216	318	467	1,155
National/Provincial Roads	Sub-Total	1,374	1,928	2,833	4,161	10,296
Foreign Loans to N/P Roads (15% of sub-total)		206	289	425	624	1,544
GKS Portion of N/P Roads (Assumed to be 15%)		237	333	489	718	1,777
Funds allocated to Kod. Surabaya		570	800	1,176	1,727	4,273
Estimated Total Funds available for GKS roads		807	1,133	1,665	2,445	6,050

Source: Estimates of JICA Study Team

As a consequence, the future budgetary fund for Repelita VII through Repelita X was estimated to be 6,050 billion Rupiah for primary arterial and collector roads as well as secondary arterial roads in the GKS region.

### 8.2 Implementation Program

The total amount of funds required for the arterial road development in GKS is 11,515 billion Rupiah, as presented in Table 8.2.1, in the period between Repelita VII and Repelita X, provided that all the toll road projects committed to by private investors will be completed by them and projects committed to by foreign aid programs will be executed during Repelita VI.

Furthermore, if the toll road projects in Table 8.2.1, which are not yet committed to by private investors, i.e. Gresik-Driyorejo Toll Road, Outer Ring Road II and Mojokerto-Gempol Toll Road (of which construction costs are estimated at 2,532 billion Rupiah in total) are excluded, a public budgetary fund of 8,983 billion or nearly 9,000 billion Rupiah is required for general arterial road



development in the GKS region.

Compared to the funds required for the road master plan development and the estimated budgetary availability (Rp. 1,777 billion, See Table 8.1.7), the budget can only afford to cover 20% of the total funds required, unless a development fund such as SUDP for Kotamadya Surabaya is reserved for the future. Since it is a national policy to decrease the dependence on foreign loans, efforts should be made to create new fund sources. Enlarged tax basis for road development, especially for local governments, is urgently required, as local governments would be responsible for most road developments necessary in the area.

The implementation program, therefore, should be prepared with reference to Table 8.2.1, where the priority projects are enumerated in descending order.

**Table 8.2.1 Accumulated Costs of Prioritized Road Development Projects**

Code No.	Sub-Code No.	Road Function	Project Route	Length (km)	Road Type		Evaluation	Development Cost				
					Number of Lanes	ROW (m)		Construction Cost (million Rp.)	Land Acquisition Cost (million Rp.)	Contingency (million Rp.)	Total (million Rp.)	Accumulation (million Rp.)
1-8)	40	P.A. (Toll)	Gresik-Diyorejo Toll Road	20.6	6	60	Very Good	349,180	154,500	75,552	579,232	579,232
4-7)	22	S.A.	Kedamen-Sumur Welut-Jemur Sari-Prapen	11.1	4 + Busway	35	Very Good	111,796	48,563	24,054	184,413	763,645
4-7)	23	S.A.	Kedamen-Sumur Welut-Jemur Sari-Prapen	14.5	4 + Busway	35	Very Good	112,803	58,800	25,740	197,343	960,988
4-15)		S.A.	Jl. Kali Anak-Waru	15.5	2 + 2	20 + 20	Very Good	156,499	99,000	38,325	293,824	1,254,812
4-5)	16	S.A.	O.R.R.(near Cerme)-Raya Darmo Permai-Sunkono-Wonokromo-Raya Panjang Jiwo-Eastern Sub-center	8.5	4 + Busway	35	Good	85,609	37,188	18,420	141,217	1,396,029
4-5)	17	S.A.	O.R.R.(near Cerme)-Raya Darmo Permai-Sunkono-Wonokromo-Raya Panjang Jiwo-Eastern Sub-center	5.4	4 + Busway	35	Good	54,387	28,350	12,411	95,148	1,491,177
4-5)	18	S.A.	O.R.R.(near Cerme)-Raya Darmo Permai-Sunkono-Wonokromo-Raya Panjang Jiwo-Eastern Sub-center	6.6	4 + Busway	35	Good	66,473	34,650	15,168	116,291	1,607,468
4-5)	19	S.A.	O.R.R.(near Cerme)-Raya Darmo Permai-Sunkono-Wonokromo-Raya Panjang Jiwo-Eastern Sub-center	7.2	4 + Busway	35	Good	72,516	37,800	16,547	126,863	1,734,331
4-13)	41	S.A.	Gresik-Diyorejo	20.6	4 + Frontage	35	Good	207,477	90,125	44,640	342,242	2,076,573
2-8)	59	P.A.	Frontage Road of Eastern Middle Ring Road(Toll Road)	13.9	4 + Frontage	50	Good	180,001	104,250	42,638	326,889	2,403,462
4-8)	24	S.A.	Jl. Jemur Andayani-Jl. Rungkut Industri-Eastern Middle Ring Road Stage 2	5.4	4	25	Good	36,451	20,250	8,505	65,206	2,468,665
4-8)	25	S.A.	Jl. Jemur Andayani-Jl. Rungkut Industri-Eastern Middle Ring Road Stage 2	2.4	4	25	Good	16,201	7,500	3,555	27,256	2,495,924
4-9)	26	S.A.	Banjaran-Sumur Welt	11.3	4	25	Good	113,810	49,438	24,487	187,735	2,683,659
4-14)	43	S.A.	Jl. Margomulyo-Jl. Mastrip	2.9	4 + Busway	35	Good	29,208	15,225	6,665	51,098	2,734,757
4-14)	44	S.A.	Jl. Margomulyo-Jl. Mastrip	2.8	4 + Busway	35	Good	28,201	14,700	6,435	49,336	2,784,093

Table 8.2.1 Accumulated Costs of Prioritized Road Development Projects (Continued)

Code No.	Sub-Code No.	Road Function	Project Route	Length (km)	Road Type		Evaluation	Development Cost				
					Number of Lanes	ROW (m)		Construction Cost (million Rp.)	Land Acquisition Cost (million Rp.)	Contingency (million Rp.)	Total (million Rp.)	Accumulation (million Rp.)
4-14)	45	S.A.	Jl. Margomulya-Jl. Mastrip	6.6	4 + Busway	35	Good	66,473	34,650	15,168	116,291	2,900,384
4-25)	56	S.A.	Jl. Raya Rungkut-Jl. J. Suprpto-Juanda Airport	9.5	4	25	Good	64,128	35,625	14,963	114,716	3,015,100
4-1)	67	S.A.	Labang-Burneh	13.5	4	25	Fair	91,129	33,750	18,732	143,611	3,158,711
4-2)	8	S.A.	Jl. Dupak-Jl. Kapas Kampung	6.5	4	25	Fair	43,877	24,375	10,238	78,490	3,237,201
4-4)	11	S.A.	O.R.R. (near Cerme)-Raya Tandes-Banyu Urip-Pandegiling-Kertajaya	13.8	4	25	Fair	93,154	43,125	20,442	156,721	3,393,922
4-4)	13	S.A.	O.R.R. (near Cerme)-Raya Tandes-Banyu Urip-Pandegiling-Kertajaya	2.7	4	25	Fair	18,226	10,125	4,253	32,604	3,426,526
4-4)	14	S.A.	O.R.R. (near Cerme)-Raya Tandes-Banyu Urip-Pandegiling-Kertajaya	6.3	4	25	Fair	42,527	23,625	9,923	76,075	3,502,601
4-6)	21	S.A.	Menganti-Jajar Tunggal-Margorejo	4.2	4	25	Fair	28,351	15,750	6,615	50,716	3,553,317
4-27)	75	S.A.	Airport Access	13.5	4	25	Fair	91,129	33,750	18,732	143,611	3,696,928
4-28)	76	S.A.	Jl. Girilaya-Jl. Raya Dukuh Kupang	3.8	4	25	Fair	25,651	14,250	5,985	45,886	3,742,814
4-30)	78	S.A.	Socah-East Labang	10.0	4	25	Fair	67,503	25,000	13,875	106,378	3,849,192
1-9)	35	P.A. (Toll)	Outer Ring Road (Toll Road)	59.0	6	60	Fair	711,920	252,000	144,588	1,108,508	4,957,700
2-3)	3	P.A.	Gresik Ring Road	26.5	4 + Frontage	50	Fair	343,168	165,625	76,319	585,112	5,542,812
3-4)	30	P.C.	Legundi-Mlirip	15.5	2	20	Fair	73,507	31,000	15,676	120,183	5,662,995
3-7)	64	P.C.	Lantongan-Mojokerto	46.3	2	20	Fair	219,573	92,600	46,826	358,999	6,021,994
4-10)	29	S.A.	Wonokromo-Gunung Sari-Jl. Mastrip (Outer Ring Road)	33.7	4	25	Fair	227,484	126,375	53,079	406,938	6,428,932
4-29)	77	S.A.	Jl. Tanjung Sari-Jl. Kali Butuh	3.0	4	25	Fair	20,251	11,250	4,725	36,226	6,465,158
2-1)	1	P.A.	Bangkalan-Torjun	54.0	4 + Frontage	50	Poor	699,286	270,000	145,393	1,114,679	7,579,837
2-11)	36	P.A.	Gresik-Legundi-Krian	26.9	4 + Frontage	50	Poor	348,348	134,500	72,427	555,275	8,135,112
3-1)	2	P.C.	Socah-Labang-Blega	42.0	2	20	Poor	199,181	84,000	42,477	325,658	8,460,770
3-2)	10	P.C.	Mantup-South of Cerme (Outer Ring Road)	21.5	2	20	Poor	101,961	43,000	21,744	166,705	8,627,475
3-3)	15	P.C.	Benjeng-Further South of Cerme (Outer Ring Road)	3.1	2	20	Poor	14,701	6,200	3,135	24,036	8,651,511
3-5)	37	P.C.	Krian-Mojosari	12.7	2	20	Poor	60,228	25,400	12,844	98,472	8,749,983
3-6)	61	P.C.	Babat-Mantup	28.0	2	20	Poor	132,787	56,000	28,318	217,105	8,967,088
3-8)	65	P.C.	Babat-Ploso-Gedeg	64.9	2	20	Poor	307,781	129,800	65,637	503,218	9,470,306
3-10)	68	P.C.	Deket-Karang Binagang	21.6	2	20	Poor	102,436	43,200	21,845	167,481	9,637,787
3-11)	69	P.C.	Pucuk-Brondong	28.2	2	20	Poor	133,735	56,400	28,520	218,655	9,856,442
3-12)	79	P.C.	East Fringe of Labang	9.0	4	25	Poor	60,752	22,500	12,488	95,740	9,952,182
4-3)	9	S.A.	Benowo-A. A. Watangrejo(Gresik)	11.0	4	25	Poor	74,253	34,375	16,294	124,922	10,077,104
4-11)	38	S.A.	Pengalengan-Tanjungan	14.7	4	25	Poor	99,229	45,938	21,775	166,942	10,224,046
4-12)	39	S.A.	Gempolkurang-Supmut	14.6	4	25	Poor	98,554	45,625	21,627	165,806	10,409,852
1-10)	63	P.A. (Toll)	Mojokerto-Gempol Toll Road	32.0	6	60	Poor	542,415	192,000	110,162	844,577	11,254,429
3-9)	66	P.C.	Mojosari-Pacet-Gemekan	33.6	2	20	Poor	159,344	67,200	33,982	260,526	11,514,955

Source: JICA Study Team

## **PART II: FEASIBILITY STUDY**

## **CHAPTER 9 INITIAL ENVIRONMENTAL EXAMINATION**

## CHAPTER 9

# INITIAL ENVIRONMENTAL EXAMINATION

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### 9.1 Preliminary Route Selection

#### (1) Route Selection for Route No. 1

This toll road starts from the existing Gresik Interchange on Surabaya-Gresik Toll Road. The interchange operates as a trumpet type interchange but is designed to be modified as a clover leaf type interchange. ROW for a clover leaf type interchange has already been prepared and the trumpet type flyover structure is ready to be modified for that purposes. The interchange area is a salt field and land acquisition is less of a problem. After passing through the salt field, the route passes through a hilly area where a huge housing development is going on. The route follows the housing development plan and passes by an existing golf course from north to south. In Driyorejo, the route passes a part of "Driyorejo Development" and turns to the west to connect to the planned Surabaya-Mojokerto toll road. On the Surabaya-Mojokerto toll road Driyorejo interchange is planned to be located just south of "Driyorejo Development", so the interchange connecting this toll road and Surabaya-Mojokerto toll road will be located more than two kilometers west of Driyorejo interchange.

#### (2) Route Selection for Route No. 2

Along the existing Surabaya-Gempol Toll Road, 20 meters ROW is available on both the west and east sides. The route is selected to be just parallel to the toll road within the already prepared ROW except where there is a local road or where a new road has been constructed. Existing fly over will be widened to reinforce the accessibility.

#### (3) Route Selection for Route No. 3

As described in 8.2(3) above, within the City of Surabaya 25 meters ROW is available. But within Kab. Sidoarjo no ROW is available. Along this road many industries, housings, markets, public and religious facilities and rice fields are scattered causing difficulty to select a new alignment for the road. The route follows the existing narrow road and widening of this road is planned.

#### (4) Route Selection for Route No. 4

Route No. 4 (27.7 km length) is a central East – West axis road with a busway (ROW = 35 m) as a Secondary Arterial Road of SMA. The route is divided into the following four sections.

- ♦ Section 1 : 8.5 km, Primary Arterial Road (Desa Domas) to Gresik-Driyorejo Toll Road

- ♦ Section 2 : 5.4 km, Gresik–Driyorejo Toll Road to Western Middle Ring Road
- ♦ Section 3 : 6.6 km, Western Middle Ring Road to Wonokromo
- ♦ Section 4 : 7.2 km, Wonokromo to Outer Ring Road

1) Section 1

This section consists of Kabupaten Gresik (7.5 km) and Kotamadya Surabaya (1.0 km). Kabupaten Gresik area has no ROW and Kotamadya Surabaya area has a 35 m ROW along the existing road. The route selection was carried out based on the established ROW situation. There is no major constrain for the route selection.

2) Section 2

A 35 m ROW along the existing road has been determined by Kotamadya Surabaya. The route selection was carried out based on the established ROW situation. It is noted that this section is under construction by a private housing developer. There is no major constrain for the route selection.

3) Section 3

A 35 m ROW along the existing road has been determined by Kotamadya Surabaya. The route selection was carried out based on the established ROW situation. It is noted that 3.3 km of the western part is being widened by a private housing developer.

4) Section 4

A 25 m ROW along the existing road has been determined by Kotamadya Surabaya. It is necessary that the current 25 m ROW is changed to a 35 m ROW to provide for a busway. The route selection was carried out based on the established ROW situation.

(5) Route Selection for Route No. 5

Route No. 5 (23.1 km length) is a southern East – West axis road with a busway (ROW = 35 m) as a Secondary Arterial Road of SMA. The route is divided into following four sections.

- ♦ Section 1 : 7.3 km, Primary Arterial Road (Desa Domas) to Gresik–Driyorejo Toll Road
- ♦ Section 2 : 4.0 km, Gresik–Driyorejo Toll Road to Western Middle Ring Road
- ♦ Section 3 : 7.5 km, Western Middle Ring Road to Jemur Sari
- ♦ Section 4 : 4.3 km, Jemur Sari to Jl. Jagir Wonokromo/Jl. Raya Panjang Jiwo

1) Section 1

This section is in Kabupaten Gresik and is without a ROW situation. The route selection was carried out along the existing road. There is no major constrain for the route selection.

2) Section 2

This section consists of Kabupaten Gresik (2.4 km) and Kotamadya Surabaya (1.6 km). Kabupaten Gresik area has no ROW and Kotamadya Surabaya area has a 35 m ROW along the existing road. The route selection was carried out based on the established ROW situation. There is no major constrain for the route selection.

The military road which runs approximately 0.5 km south of and parallel to the existing road was considered as an alternative route for this section to minimize land acquisition cost. Since the military road can not be opened to public traffic according to Indonesian regulations, the existing road was selected as the optimum route.

### 3) Section 3

This section is new road construction using the ROW situation for Surabaya–Mojokerto Toll Road as at the Feasibility Study stage. The ROW of Surabaya–Mojokerto Toll Road was changed to the south in the detailed design stage. The optimum route selection was controlled by the inspection road of Kedurus Retarding Pond in order to minimize land acquisition cost.

### 4) Section 4

A 45 m ROW has been determined along the existing road. There is no major constrain for the route selection.

## 9.2 Initial Environmental Examination

An Initial Environmental Examination (IEE) was carried out by Screening and Scoping methodology using existing data and information on the proposed priority projects. The Projects have been prioritized in Chapter 7 and are summarized in the following table.

The purpose of the Initial Environmental Examination is to identify preliminary negative impacts through the Screening and Scoping activities. Following that environmental considerations are assessed, if required. Environmental items which will be used for environmental site survey on the Environmental Impact Assessment are examined.

Table 9.2.1 Summary of Priority Projects

No.	Code	Title	Length	Remarks
1.	4-5)	Cerme South - Jl.Raya P.Jimo	27.7 Km	Widening
2.	4-7)	Kedamean - Jl.Jemur Sari	22.3 Km	Widening
3.	4-15)	Jl.Kali Anak - Waru	15.5 Km	Road parallel to toll road
4.	4-25)	Jl.Raya Rungkut - Jl.J.Saprapto	9.5 Km	Widening
5.	1-8) and 4-13)	Gresik-Driyorejo Toll Road	20.6 Km	Highway (Toll)

As a results of the Screening and Scoping assessment, the following comments for each priority project are made. Screening and Scoping sheets are shown in the following tables.

#### 1) Cerme South - Jl.Raya P.Jimo (27.7 Km Widening)

The alignment passes through the central part of Surabaya from the east end of Surabaya near the coast to inland Kabupaten Gresik on the west side. The alignment forms are east-west axis, planned total length is 27.7 Km, and the project component is widening of existing roads. Main land use of the area is a mixture, such as fish ponds on the east side near the sea, commercial area in the central part of Surabaya, residential area in urbanized areas and others.

Major negative impact is resettlement along the road due to land acquisition for widening, while there is neither major impact on the natural environment nor on pollution. Minor impacts may include some factors such as the hydrological situation, landscape, air pollution,

noise and vibration etc., which have been predicted through the preliminary examination.

2) Kedamean - Jl.Jemur Sari (22.3 Km Widening)

This alignment also forms an east-west axis in the southern part of Surabaya City and passes through from the North end of Jl.Jemur Sari to Kedamean in the South part of Kabupaten Gresik. Total length of the alignment is 22.3 Km and the project component is mainly widening works.

Major negative impact is also resettlement along the road because of land acquisition for widening, while there is neither major impact on the natural environment nor on pollution. Minor impacts may include some factors such as the hydrological situation, landscape, air pollution, noise and vibration etc., which have been predicted through the preliminary examination.

3) Jl.Kali Anak - Waru (15.5 Km, New road parallel to toll road)

This proposed road is aligned along with the Surabaya-Gempol Toll Road which is a north-south axis. The alignment passes through the west side fringe area of a high density urbanized area from Jl.Kali Anak to Waru. Total length of the alignment is 15.5 Km and the project component is mainly new road.

No major impact is predicted, although minor impacts may include items such as resettlement, economic activities, landscape and land subsidence which are considered for further environmental study.

4) Jl.Raya Rungkut - Jl.J.Saprapto (9.5 Km, Widening)

The alignment of the proposed widening to existing roads is from Jl.Raya Rungkut to Jl.J.Saprapto located in south-east part of Surabaya. Total length is 9.5 Km. This area is newly developed as an industrial estate. The project component is widening of existing roads

A few negative impacts such as resettlement, air pollution and noise are preliminarily predicted in accordance with the road construction and operation.

5) Gresik-Driyorejo Toll (20.6 Km, Highway (Toll road))

The proposed toll way passes through the western suburbs of Surabaya from Gresik City to Driyorejo. The project comprises a total length of 20.6 Km, and the project component is new toll road development. Urbanization in the area is growing very fast recently such as housing development.

Major environmental impacts on this project are resettlement due to land acquisition for the new road, split of community due to access controlled road design and topography along the road due to fillings. There are no major impacts on the natural environment nor on pollution. Minor impacts such as on the hydrological situation, landscape, air pollution etc., have been predicted through the preliminary examination.



## (1) Cerme South - Jl.Raya P.Jimo (27.7 Km)

Screening

Table 9.2.2 No. 1 Check List for Screening (Cerme South - Jl.Raya P.Jimo)

No.	Environmental Items	Description	Evaluation	Remarks (reason)
<b>Social Environment</b>				
1.	Resettlement	Resettlement by occupancy of proposed land	Yes	Residence and commercial exist in projective area
2.	Economic Activities	Loss of productive opportunity such as land	No	Change of economic activities is unknown
3.	Traffic and Public Facilities	Influence of existing traffic such as congestion	Yes	Public facilities exist in the project area
4.	Split of Communities	Split of Communities by obstruction of traffic	No	Non access control cause no obstruction
5.	Cultural Property	Loss of cultural property and falling of values	No	Cultural heritage do not exist
6.	Water Rights and Common Rights	Obstruction of fishing rights, water rights, and common rights of forest	Unknown	Water treatment plant exists
7.	Public Health Condition	Deterioration of a hygienic environment by production of refuse and noxious insect	No	Lots of refuse will not produced
8.	Waste	Occurrence of waste dumps and solid waste	Yes	A little waste of dumps will be produced
9.	Hazards (Risk)	Increase of possibility of danger of landslide and accident	No	Less possibilities to occur
<b>Natural Environment</b>				
10.	Topography and Geology	Change of valuable topography and geology by excavation or filling works	No	Large scale of earth work is not included
11.	Soil Erosion	surface soil erosion by rainwater after land development (vegetation removal)	No	Subjected area is developed already
12.	Ground Water	Change of distribution of ground water by large scale excavation	No	No large scale excavation
13.	Hydrological Situation	Change of river discharge and riverbed condition due to landfill and drainage inflow	Unknown	Subject area includes lower lands
14.	Coastal Zone	Coastal erosion and sedimentation due to landfill or change in marine condition	No	No plan along the coast
15.	Flora and Fauna	Obstruction of breeding and extinction of species due to change of habitat condition	Unknown	Wet land is important for ecosystem
16.	Meteorology	Change of temperature, precipitation, wind, etc., due to large scale development	No	There are no large scale development
17.	Landscape	Change of topography and vegetation by land development and harmonious obstruction by structural objects	Unknown	Fly over affects on urban landscape
<b>Pollution</b>				
18.	Air Pollution	Pollution caused by exhaust gas or toxic gas from vehicles and factories	Yes	Impact by exhaust gas from increasing traffic
19.	Water Pollution	Pollution by inflow of silt, and effluent into rivers and ground water	Unknown	Less impact by road facilities
20.	Soil Contamination	Contamination of soil by dust and chemicals	No	No activities with chemicals
21.	Noise and Vibration	Noise and vibration generated by vehicles	Yes	During construction and operation
22.	Land Subsidence	Deformation of land and land subsidence due to the lowering of ground water	Yes	Some sensitive area exists such as soft ground
23.	Offensive Odor	Generation of exhaust gas and offensive odor by facility construction and operation	No	No factor

## Scoping

Table 9.2.3 No. 1 Check List for Scoping (Cerme South - Jl.Raya P.Jimo)

No.	Environmental Items	Evaluation	Remarks (reason)
<b>Social Environment</b>			
1.	Resettlement	B	Resettlement will be occurred due to construction of new roads and improvement of existing roads
2.	Economic Activities	D	Large change of economic activities will not occur
3.	Traffic and Public Facilities	B	It is necessary to consider impacts for schools, medical, religious facilities in urbanized area
4.	Split of Communities	D	Non access controlled road will not split the community
5.	Cultural Property	D	It is necessary to consider impacts for cultural properties in urbanized area
6.	Water Rights and Common Rights	C	Purification plant exists near by alignment
7.	Public Health Condition	D	Large amount of refuse will not occur
8.	Waste	B	A little waste of dump will be produced by construction
9.	Hazards (Risk)	D	It is less possibility to occur natural disaster
<b>Natural Environment</b>			
10.	Topography and Geology	D	Large scale land development is not included
11.	Soil Erosion	D	Large scale of soil erosion has not been identified
12.	Ground Water	D	There is no large scale structure in under ground
13.	Hydrological Situation	C	No structure will not be built in the rivers
14.	Coastal Zone	D	There is no alignment in the coastal area
15.	Flora and Fauna	C	There is no valuable flora and fauna, but there are wetland in the subject area. It is important for ecosystem.
16.	Meteorology	D	Large scale filling and construction of high building will not be planned
17.	Landscape	B	It is necessary to harmonize urban landscape and rural landscape
<b>Pollution</b>			
18.	Air Pollution	B	There is impact on air quality by increasing traffic volume during operation stage
19.	Water Pollution	C	A little influence for rivers by road discharge water is predicted
20.	Soil Contamination	D	There is no action for soil contamination
21.	Noise and Vibration	B	There is impact on noise and vibration by increasing traffic volume during operation stage
22.	Land Subsidence	B	Sensitive area such as soft ground exist in lower land
23.	Offensive Odor	D	There is no factor regarding offensive odor.

Note 1: Evaluation categories:

A: Serious impact is predicted

B: Some Impact is predicted

C: Extent of impact is unknown (Examination is needed. Impact may become clear as study progresses)

D: No impact is predicted. EIA is not necessary

Note 2: The evaluation should be made with reference to the Explanation of Item.

## (2) Kedamean - Jl.Jemur Sari (22.3 Km)

## Screening

Table 9.2.4 No. 2 Check List for Screening (Kedamean - Jl.Jemur Sari)

No.	Environmental Items	Description	Evaluation	Remarks (reason)
<b>Social Environment</b>				
1.	Resettlement	Resettlement by occupancy of proposed land	Yes	Residence exist in projective area
2.	Economic Activities	Loss of productive opportunity such as land	No	No large change of economic activities
3.	Traffic and Public Facilities	Influence of existing traffic such as congestion	Yes	Public facilities exist in the project area
4.	Split of Communities	Split of Communities by obstruction of traffic	No	No access controlled road occur no split
5.	Cultural Property	Loss of cultural property and falling of values	No	No valuable cultural heritage exists
6.	Water Rights and Common Rights	Obstruction of fishing rights, water rights, and common rights of forest	Unknown	Rivers and canals for agriculture exist
7.	Public Health Condition	Deterioration of a hygienic environment by production of refuse and noxious insect	No	Lots of refuse will not produced
8.	Waste	Occurrence of waste dumps and solid waste	Yes	A little waste of dumps will be produced
9.	Hazards (Risk)	Increase of possibility of danger of landslide and accident	No	Less possibility
<b>Natural Environment</b>				
10.	Topography and Geology	Change of valuable topography and geology by excavation or filling works	No	No large scale structure or earth work
11.	Soil Erosion	surface soil erosion by rainwater after land development (vegetation removal)	No	Subjected area is developed already
12.	Ground Water	Change of distribution of ground water by large scale excavation	No	Main work is Filling
13.	Hydrological Situation	Change of river discharge and riverbed condition due to landfill and drainage inflow	Unknown	No structure will not be built in the rivers
14.	Coastal Zone	Coastal erosion and sedimentation due to landfill or change in marine condition	No	No large scale excavation
15.	Flora and Fauna	Obstruction of breeding and extinction of species due to change of habitat condition	Unknown	Wet land is important for ecosystem
16.	Meteorology	Change of temperature, precipitation, wind, etc., due to large scale development	No	There are no large scale development
17.	Landscape	Change of topography and vegetation by land development and harmonious obstruction by structural objects	Yes	Fly over bridges affect on urban landscape
<b>Pollution</b>				
18.	Air Pollution	Pollution caused by exhaust gas or toxic gas from vehicles and factories	Yes	Impact by exhaust gas from increasing traffic
19.	Water Pollution	Pollution by inflow of silt, and effluent into rivers and ground water	Unknown	Less impact by road facilities
20.	Soil Contamination	Contamination of soil by dust and chemicals	No	No chemical activities for soil
21.	Noise and Vibration	Noise and vibration generated by vehicles	Yes	During construction and operation
22.	Land Subsidence	Deformation of land and land subsidence due to the lowering of ground water	Yes	Sensitive lands exist in the subject area
23.	Offensive Odor	Generation of exhaust gas and offensive odor by facility construction and operation	No	No factor

## Scoping

Table 9.2.5 No. 2 Check List for Scoping (Kedamean - Jl. Jemur Sari)

No.	Environmental Items	Evaluation	Remarks (reason)
<b>Social Environment</b>			
1.	Resettlement	B	Resettlement will be occurred due to construction of new roads and improvement of existing roads
2.	Economic Activities	D	Large change of economic activities will not occur
3.	Traffic and Public Facilities	B	It is necessary to consider impacts for schools, hospital and public facilities in subject area
4.	Split of Communities	D	Non access controlled roads will not occur split
5.	Cultural Property	D	There is no cultural property along the planed roads
6.	Water Rights and Common Rights	C	It is unknown. Rivers and canals for agriculture exist
7.	Public Health Condition	D	Large amount of refuse will not occur
8.	Waste	B	A little waste of dump will be produced by construction
9.	Hazards (Risk)	D	It is less possibility to occur natural disaster
<b>Natural Environment</b>			
10.	Topography and Geology	D	Large land development is not included
11.	Soil Erosion	D	Large scale of soil erosion has not been identified
12.	Ground Water	D	There is no large scale structure in under ground
13.	Hydrological Situation	C	No large scale excavation will not be included
14.	Coastal Zone	D	There is no alignment in the coastal area
15.	Flora and Fauna	C	There is no valuable flora and fauna, but there are wetland in the subject area. It is important for ecosystem.
16.	Meteorology	D	Large scale felling and construction of high building will not be planned
17.	Landscape	B	It is necessary to harmonize urban landscape and rural landscape
<b>Pollution</b>			
18.	Air Pollution	B	There is impact on air quality by increasing traffic volume during operation stage
19.	Water Pollution	C	There is less impact on water quality by road project, however road facilities might have impacts.
20.	Soil Contamination	D	There is no action for soil contamination
21.	Noise and Vibration	B	There is impact on noise and vibration by increasing traffic volume during operation stage
22.	Land Subsidence	B	Sensitive lands exists in subject area
23.	Offensive Odor	D	There is no factor regarding offensive odor

Note 1: Evaluation categories:

A: Serious impact is predicted

B: Some Impact is predicted

C: Extent of impact is unknown (Examination is needed. Impact may become clear as study progresses)

D: No impact is predicted. EIA is not necessary

Note 2: The evaluation should be made with reference to the Explanation of Item.

## (3) Jl.Kali Anak - Waru (15.5 Km)

Screening

Table 9.2.6 No. 3 Check List for Screening (Jl.Kali Anak - Waru)

No.	Environmental Items	Description	Evaluation	Remarks (reason)
<b>Social Environment</b>				
1.	Resettlement	Resettlement by occupancy of proposed land	Yes	Residence exist in projective area
2.	Economic Activities	Loss of productive opportunity such as land	Yes	Commercial and agricultural lands exist
3.	Traffic and Public Facilities	Influence of existing traffic such as congestion	Yes	Public facilities exist in the project area
4.	Split of Communities	Split of Communities by obstruction of traffic	No	No access controlled roads occur no split
5.	Cultural Property	Loss of cultural property and falling of values	No	No valuable cultural heritage exists
6.	Water Rights and Common Rights	Obstruction of fishing rights, water rights, and common rights of forest	Unknown	Surabaya river and other canals exist
7.	Public Health Condition	Deterioration of a hygienic environment by production of refuse and noxious insect	No	Lots of refuse will not produced
8.	Waste	Occurrence of waste dumps and solid waste	Yes	A little waste of dumps will be produced
9.	Hazards (Risk)	Increase of possibility of danger of landslide and accident	No	Less possibility
<b>Natural Environment</b>				
10.	Topography and Geology	Change of valuable topography and geology by excavation or filling works	No	No large scale structure or earth work
11.	Soil Erosion	surface soil erosion by rainwater after land development (vegetation removal)	No	Subjected area is developed already
12.	Ground Water	Change of distribution of ground water by large scale excavation	No	No large scale excavation
13.	Hydrological Situation	Change of river discharge and riverbed condition due to landfill and drainage inflow	No	No structure will not be built in the river
14.	Coastal Zone	Coastal erosion and sedimentation due to landfill or change in marine condition	No	No plan along the coast
15.	Flora and Fauna	Obstruction of breeding and extinction of species due to change of habitat condition	No	No natural flora and fauna
16.	Meteorology	Change of temperature, precipitation, wind ,etc., due to large scale development	No	There are no large scale development
17.	Landscape	Change of topography and vegetation by land development and harmonious obstruction by structural objects	Yes	Fly over bridges will affect on urban landscape
<b>Pollution</b>				
18.	Air Pollution	Pollution caused by exhaust gas or toxic gas from vehicles and factories	Yes	Impact by exhaust gas from increasing traffic
19.	Water Pollution	Pollution by inflow of silt, and effluent into rivers and ground water	Unknown	Less impact by road facilities
20.	Soil Contamination	Contamination of soil by dust and chemicals	No	No activities for soil
21.	Noise and Vibration	Noise and vibration generated by vehicles	Yes	During construction and operation
22.	Land Subsidence	Deformation of land and land subsidence due to the lowering of ground water	Yes	Soft lands exist
23.	Offensive Odor	Generation of exhaust gas and offensive odor by facility construction and operation	No	No factor

## Scoping

Table 9.2.7 No. 3 Check List for Scoping (Jl.Kali Anak - Waru)

No.	Environmental Items	Evaluation	Remarks (reason)
<b>Social Environment</b>			
1.	Resettlement	B	Resettlement will be occurred due to construction of new roads and improvement of existing roads
2.	Economic Activities	B	Large change of economic activities will not occur
3.	Traffic and Public Facilities	B	It is necessary to consider impacts for schools, market, religious facilities
4.	Split of Communities	D	It is not predicted new split of communities due to non access controlled roads
5.	Cultural Property	D	There is no cultural property
6.	Water Rights and Common Rights	C	It is unknown. The plan will overpass Surabaya river and some canals for agriculture.
7.	Public Health Condition	D	Large amount of refuse will not occur
8.	Waste	B	A little waste of dump will be produced by construction
9.	Hazards (Risk)	D	It is less possibility to occur natural disaster
<b>Natural Environment</b>			
10.	Topography and Geology	D	Large land development is not included
11.	Soil Erosion	D	Large scale excavation is not included
12.	Ground Water	D	There is no large scale structure in under ground
13.	Hydrological Situation	D	River system will not be taken account for large scale direct impact
14.	Coastal Zone	D	There is no alignment in the coastal area
15.	Flora and Fauna	D	There is no valuable flora and fauna
16.	Meteorology	D	Large scale filling and construction of higher structure will not be planned
17.	Landscape	B	Fly over and other structure will affect on urban landscape and rural landscape
<b>Pollution</b>			
18.	Air Pollution	B	There is impact on air quality by increasing traffic volume during operation stage
19.	Water Pollution	C	There is less impact on water quality by road project, however road facilities might have impacts.
20.	Soil Contamination	D	There is no action for soil contamination
21.	Noise and Vibration	B	There is impact on noise and vibration by increasing traffic volume during operation stage
22.	Land Subsidence	C	There is soft lands
23.	Offensive Odor	D	There is no factor regarding offensive odor

Note 1: Evaluation categories:

A: Serious impact is predicted

B: Some Impact is predicted

C: Extent of impact is unknown (Examination is needed. Impact may become clear as study progresses)

D: No impact is predicted. EIA is not necessary

Note 2: The evaluation should be made with reference to the Explanation of Item.

## (4) Jl.Raya Rungkut - Jl.J.Suprpto (9.5 Km)

Screening

Table 9.2.8 No. 4 Check List for Screening (Jl.Raya Rungkut - Jl.J.Suprpto)

No.	Environmental Items	Description	Evaluation	Remarks (reason)
<b>Social Environment</b>				
1.	Resettlement	Resettlement by occupancy of proposed land	Yes	Residence and industry exist in projective area
2.	Economic Activities	Loss of productive opportunity such as land	Yes	Industries will be allocated
3.	Traffic and Public Facilities	Influence of existing traffic such as congestion	Yes	Public facilities exist in the project area
4.	Split of Communities	Split of Communities by obstruction of traffic	No	No access controlled road
5.	Cultural Property	Loss of cultural property and falling of values	No	No cultural heritage exists
6.	Water Rights and Common Rights	Obstruction of fishing rights, water rights, and common rights of forest	Unknown	Canals for agriculture exist
7.	Public Health Condition	Deterioration of a hygienic environment by production of refuse and noxious insect	No	Lots of refuse will not produced
8.	Waste	Occurrence of waste dumps and solid waste	Yes	A little waste of dumps will be produced
9.	Hazards (Risk)	Increase of possibility of danger of landslide and accident	No	Less possibility
<b>Natural Environment</b>				
10.	Topography and Geology	Change of valuable topography and geology by excavation or filling works	No	No large scale earth work
11.	Soil Erosion	surface soil erosion by rainwater after land development (vegetation removal)	No	Developed area
12.	Ground Water	Change of distribution of ground water by large scale excavation	No	No large scale excavation
13.	Hydrological Situation	Change of river discharge and riverbed condition due to landfill and drainage inflow	No	No change of canals is included
14.	Coastal Zone	Coastal erosion and sedimentation due to landfill or change in marine condition	No	No plan along the coast
15.	Flora and Fauna	Obstruction of breeding and extinction of species due to change of habitat condition	No	No natural flora and fauna
16.	Meteorology	Change of temperature, precipitation, wind, etc., due to large scale development	No	There are no large scale development
17.	Landscape	Change of topography and vegetation by land development and harmonious obstruction by structural objects	No	Large scale structure is not included
<b>Pollution</b>				
18.	Air Pollution	Pollution caused by exhaust gas or toxic gas from vehicles and factories	Yes	Impact by exhaust gas from increasing cars
19.	Water Pollution	Pollution by inflow of silt, and effluent into rivers and ground water	Unknown	Residual drainage from roads occur
20.	Soil Contamination	Contamination of soil by dust and chemicals	No	No activities for soil
21.	Noise and Vibration	Noise and vibration generated by vehicles	Yes	During construction and operation
22.	Land Subsidence	Deformation of land and land subsidence due to the lowering of ground water	Unknown	Soft lands exist
23.	Offensive Odor	Generation of exhaust gas and offensive odor by facility construction and operation	No	No factor

## Scoping

Table 9.2.9 No. 4 Check List for Scoping (Jl.Raya Rungkut - Jl.J.Suprpto)

No.	Environmental Items	Evaluation	Remarks (reason)
<b>Social Environment</b>			
1.	Resettlement	B	Resettlement (residences, factories) will be occurred due to construction of new roads and improvement of existing roads
2.	Economic Activities	B	Large change of economic activities will not occur
3.	Traffic and Public Facilities	B	It is necessary to consider impacts for schools and hospital in urbanized area
4.	Split of Communities	D	Non access control road will not split the community
5.	Cultural Property	D	It is necessary to consider impacts for cultural properties in urbanized area
6.	Water Rights and Common Rights	C	There are canals for agriculture
7.	Public Health Condition	D	Large amount of refuse will not occur
8.	Waste	B	A little waste of dump will be produced by construction
9.	Hazards (Risk)	D	It is less possibility to occur natural disaster
<b>Natural Environment</b>			
10.	Topography and Geology	D	Large scale land development is not included
11.	Soil Erosion	D	Large scale of soil erosion has not been identified
12.	Ground Water	D	There is no large scale structure in under ground
13.	Hydrological Situation	D	No structure will not be built in the canals
14.	Coastal Zone	D	There is no alignment in the coastal area
15.	Flora and Fauna	D	There is no valuable flora and fauna, but there are wetland in the subject area. It is important for ecosystem.
16.	Meteorology	D	Large scale filling and construction of high building will not be planned
17.	Landscape	D	There is no large scale structure
<b>Pollution</b>			
18.	Air Pollution	B	There is impact on air quality by increasing traffic volume during operation stage
19.	Water Pollution	C	There is less impact on water quality by road project, however road facilities might have impacts.
20.	Soil Contamination	D	There is no action for soil contamination
21.	Noise and Vibration	B	There is impact on noise and vibration by increasing traffic volume during operation stage
22.	Land Subsidence	D	There is soft lands in subject area
23.	Offensive Odor	D	There is no factor regarding offensive odor

Note 1: Evaluation categories:

A: Serious impact is predicted

B: Some Impact is predicted

C: Extent of impact is unknown (Examination is needed. Impact may become clear as study progresses)

D: No impact is predicted. EIA is not necessary

Note 2: The evaluation should be made with reference to the Explanation of Item.



## (5) Gresik - Driyorejo Toll Road (20.6 Km)

Screening

Table 9.2.10 No. 5 Check List for Screening (Gresik - Driyorejo Toll Road)

No.	Environmental Items	Description	Evaluation	Remarks (reason)
<b>Social Environment</b>				
1.	Resettlement	Resettlement by occupancy of proposed land	Yes	Residence exist in projective area
2.	Economic Activities	Loss of productive opportunity such as land	Unknown	Change of economic activities is unknown
3.	Traffic and Public Facilities	Influence of existing traffic such as congestion	Unknown	Public facilities exist in the project area
4.	Split of Communities	Split of Communities by obstruction of traffic	Yes	Access controlled roads
5.	Cultural Property	Loss of cultural property and falling of values	Unknown	Cultural heritage in unknown
6.	Water Rights and Common Rights	Obstruction of fishing rights, water rights, and common rights of forest	Yes	The plan passes Surabaya river
7.	Public Health Condition	Deterioration of a hygienic environment by production of refuse and noxious insect	No	Lots of refuse will not produced
8.	Waste	Occurrence of waste dumps and solid waste	Yes	A little waste of dumps will be produced
9.	Hazards (Risk)	Increase of possibility of danger of landslide and accident	No	Less possibility
<b>Natural Environment</b>				
10.	Topography and Geology	Change of valuable topography and geology by excavation or filling works	Yes	low filling structure
11.	Soil Erosion	surface soil erosion by rainwater after land development (vegetation removal)	Yes	Volume of surface water will be increased by development
12.	Ground Water	Change of distribution of ground water by large scale excavation	No	Main work is Filling
13.	Hydrological Situation	Change of river discharge and riverbed condition due to landfill and drainage inflow	No	Some rivers and canals exist in project area
14.	Coastal Zone	Coastal erosion and sedimentation due to landfill or change in marine condition	No	No plan along the coast
15.	Flora and Fauna	Obstruction of breeding and extinction of species due to change of habitat condition	Unknown	No valuable flora and fauna, marsh lands exist
16.	Meteorology	Change of temperature, precipitation, wind, etc., due to large scale development	No	There are no large scale development
17.	Landscape	Change of topography and vegetation by land development and harmonious obstruction by structural objects	Yes	Low filling structure will affect on rural landscape
<b>Pollution</b>				
18.	Air Pollution	Pollution caused by exhaust gas or toxic gas from vehicles and factories	Yes	Impact by exhaust gas from increasing cars
19.	Water Pollution	Pollution by inflow of silt, and effluent into rivers and ground water	Unknown	Less impact by road facilities
20.	Soil Contamination	Contamination of soil by dust and chemicals	No	No activities for soil
21.	Noise and Vibration	Noise and vibration generated by vehicles	Yes	During construction and operation
22.	Land Subsidence	Deformation of land and land subsidence due to the lowering of ground water	Yes	Soft lands exist
23.	Offensive Odor	Generation of exhaust gas and offensive odor by facility construction and operation	No	No factor

## Scoping

Table 9.2.11 No. 5 Check List for Scoping (Gresik - Driyorejo Toll Road)

No.	Environmental Items	Evaluation	Remarks (reason)
<b>Social Environment</b>			
1.	Resettlement	B	Resettlement (residence) will be occurred due to construction of new roads
2.	Economic Activities	C	The roads align on farm and salt farm
3.	Traffic and Public Facilities	C	It is necessary to consider impacts for schools and hospital in urbanized area
4.	Split of Communities	B	Filled road bed produces some splits. And the plan is an access controlled road
5.	Cultural Property	C	It is necessary to consider impacts for cultural properties
6.	Water Rights and Common Rights	B	The plan pass over Surabaya river
7.	Public Health Condition	D	Large amount of refuse will not occur
8.	Waste	B	A little waste of dump will be produced by construction
9.	Hazards (Risk)	D	It is less possibility to occur natural disaster
<b>Natural Environment</b>			
10.	Topography and Geology	B	Large scale earth work is included
11.	Soil Erosion	B	Large scale of earth work affect on surface water index
12.	Ground Water	D	There is no large scale structure in under ground
13.	Hydrological Situation	D	No structure will not be built in the rivers
14.	Coastal Zone	D	There is no alignment in the coastal area
15.	Flora and Fauna	C	There is no valuable flora and fauna, but there are wetland in the subject area. It is important for ecosystem.
16.	Meteorology	D	Large scale felling and construction of high building will not be planned
17.	Landscape	C	It is necessary to harmonize urban landscape and rural landscape
<b>Pollution</b>			
18.	Air Pollution	B	There is impact on air quality by increasing traffic volume during operation stage
19.	Water Pollution	C	There is less impact on water quality by road project, however road facilities might have impacts.
20.	Soil Contamination	D	There is no action for soil contamination
21.	Noise and Vibration	B	There is impact on noise and vibration by increasing traffic volume during operation stage
22.	Land Subsidence	B	Projects will not pump ground water
23.	Offensive Odor	D	There is no factor regarding offensive odor

Note 1: Evaluation categories:

A: Serious impact is predicted

B: Some Impact is predicted

C: Extent of impact is unknown (Examination is needed. Impact may become clear as study progresses)

D: No impact is predicted. EIA is not necessary

Note 2: The evaluation should be made with reference to the Explanation of Item.

Table 9.2.12 Summary of Scoping

No.	Environmental Items	No. 1 Evaluation	No. 2 Evaluation	No. 3 Evaluation	No. 4 Evaluation	No. 5 Evaluation	Summary Evaluation
<b>Social Environment</b>							
1.	Resettlement	B	B	B	B	B	B
2.	Economic Activities	B	B	B	B	C	C
3.	Traffic and Public Facilities	B	B	B	B	C	B
4.	Split of Communities	D	D	D	D	B	C
5.	Cultural Property	D	D	D	D	D	B
6.	Water Rights and Common Rights	C	C	C	C	B	C
7.	Public Health Condition	D	D	D	D	D	D
8.	Waste	B	B	B	B	B	D
9.	Hazards (Risk)	D	D	D	D	D	D
<b>Natural Environment</b>							
10.	Topography and Geology	D	D	B	D	B	C
11.	Soil Erosion	D	D	D	D	B	C
12.	Ground Water	D	D	D	D	D	D
13.	Hydrological Situation	C	C	D	D	D	C
14.	Coastal Zone	D	D	D	D	D	D
15.	Flora and Fauna	C	C	D	D	C	C
16.	Meteorology	D	D	D	D	D	D
17.	Landscape	B	B	B	D	C	B
<b>Pollution</b>							
18.	Air Pollution	B	B	B	B	B	B
19.	Water Pollution	C	C	C	C	C	C
20.	Soil Contamination	D	D	D	D	D	D
21.	Noise and Vibration	B	B	B	B	B	B
22.	Land Subsidence	B	B	B	C	B	B
23.	Offensive Odor	D	D	D	D	D	D

Note 1: Evaluation categories B

A: Serious impact is predicted

B: Some Impact is predicted

C: Extent of impact is unknown (Examination is needed. Impact may become clear as study progresses)

D: No impact is predicted. EIA is not necessary

Note 2: The evaluation should be made with reference to the Explanation of Item.

Table 9.2.13 Matrix for Scoping Classified by Project Phase

Major facilities, activities Activities which may cause impacts		Roads/ Roadside Facilities/ Construction Roads					
		Overall Evaluation	Before Operation		After Operation		
Environmental Items			Reclamation and spatial occupancy	Operation of construction equipment	Occupancy of land	Operation of vehicle	Accumulation of people and goods
Social Environment	1.	Resettlement	XX	XX			
	2.	Economic Activities	X		X		X
	3.	Traffic and Public Facilities	X			X	
	4.	Split of Communities	X		X		
	5.	Cultural Property	X	X		X	X
	6.	Water Rights and Rights of Common	X		X		X
	7.	Public Health Condition					
	8.	Waste	X	X			X
	9.	Hazards (Risk)					
Natural Environment	10.	Topography and Geology	X	X			
	11.	Soil Erosion	X	X			
	12.	Ground Water					
	13.	Hydrological Situation	X	X	X		
	14.	Coastal Zone					
	15.	Flora and Fauna	X	X	X	X	
	16.	Meteorology					
	17.	Landscape	X	X	X		
Pollution	18.	Air Pollution	XX		X	XX	
	19.	Water Pollution	X			X	
	20.	Soil Contamination					
	21.	Noise and Vibration	XX	X	X	XX	
	22.	land Subsidence					
	23.	Offensive Odor					

Note: XX: The environmental items to which special attention has to be paid. They might serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measures.

### (3) Environmental Considerations for EIA Study (AMDAL Study)

According to the viewpoint of environmental considerations based on the above mentioned Screening and Scoping assessment, comments of the projects are as follows;

#### 1) Resettlement

Resettlement will occur owing to the construction of new roads, widening of existing roads and the construction of toll road. It is important to compensate for this by providing appropriate relocation space, especially commercial, industrial and residential areas in SMA.

#### 2) Public Facilities

There are many educational, medical and religious facilities in the proposed planning area. The area suffers from air pollution and noise generated by vehicular traffic, so there will be a need for countermeasures for preserving the environment in the vicinity of roads.

#### 3) Cultural Property

There are many cultural monuments in GKS. A significant cultural property is the Majapahit archaeological site nearby Mojokerto city. However small scale cultural properties remain in the planning area. There will be a need for careful planning to preserve these regional treasures.

#### 4) Solid Waste

Unwanted materials from constructions are at present transported to the lower area of SMA and used to fill marsh land. It is necessary to consider disposal measures for these materials.

#### 5) Flora and Fauna

It seems that valuable flora and fauna do not exist in the planning area. However marshes which are the habitats of flora and natatorial birds are important to the ecosystem. Therefore marshes should be considered for preservation.

#### 6) Landscape

Large scale crossing structures such as bridges and flyovers will affect the urban and rural landscape. A design which will take into consideration harmonization with the surrounding landscape is required.

#### 7) Air Pollution

In the relation between automobile exhaust gas and speed, automobiles emit a large volume of gas at low speeds. Therefore, there will be a need for measures to improve the present condition of air pollution by enabling traffic to flow more smoothly.

#### 8) Noise and Vibration

The present noise environment has deteriorated owing to traffic and the noise of daily life. However, countermeasures must be taken against increasing traffic noise created by

increasing numbers of traffic and rising speeds.

At present there is no vibration problem due to slow speed although the condition of the road surfaces is poor. However, complaints about excessive vibration will occur in the future due to a combination of higher speeds and the poor condition of the road surfaces.

#### (4) Scope of the EIA Study

In view of the environmental considerations previously discussed, an Environmental Impact Assessment Study (AMDAL Study) in accordance with the Indonesian environmental assessment system including the guidelines of environmental impact assessment prepared by the Ministry of Works should be carried out for the Feasibility Study. The following are items required to be surveyed in accordance with the Guidelines.

##### a. Physical - Chemical

- ♦ Climate
- ♦ Air quality and noise
- ♦ Physiography
- ♦ Hydrology and water quality
- ♦ Space, land and soil

##### b. Biology

- ♦ Flora
- ♦ Fauna

##### c. Socio-Economic & Culture

- ♦ Demography
- ♦ Economics
- ♦ Culture
- ♦ Public Health

##### d. Traffic Condition

##### e. Utilities

Comparing the items required for survey by the AMDAL study and the results of the Initial Environmental Examination, the following items, as well as the required items, are proposed for further study.

#### 1) Social Environment

- ♦ Relocation
- ♦ Perceptions of Communities Impacted
- ♦ Economic Activities
- ♦ Land Use
- ♦ Water Rights and Common Rights
- ♦ Infrastructure and Public Facilities
- ♦ Archaeological and Historical Attributes

2) Natural Environment

- ◆ Geology, Topography, Soil
- ◆ Hydrology
- ◆ Flora and Fauna
- ◆ Landscape

3) Pollution

- ◆ Air Quality
- ◆ Water Quality
- ◆ Noise and Vibration
- ◆ Land Subsidence

## **CHAPTER 10 FUTURE TRAFFIC DEMAND PROJECTION**



## CHAPTER 10

# FUTURE TRAFFIC DEMAND PROJECTION

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### **10.1 Future Road Network**

In order to examine the future traffic demand of the project roads, the road networks in 2008 and 2018 were assumed to follow the priority order of the proposed master plan network as shown in Figures 10.1.1 through 10.1.4.

Link conditions of the network were basically divided into 6 categories. They are, (1) Multiple lane motor way (toll road), (2) Urban Road 4-lane/6-lane divided, (3) Urban road 2-lane undivided, (4) One way road, (5) Inter-urban road 4-lane divided, and (6) Inner-urban 2-lane undivided. These road categories were further sub-divided depending on width of the carriageway.

### **10.2 Toll Collection System**

There are several planned toll roads in Surabaya Metropolitan Area (SMA). They are divided into intra-urban toll roads and inter-regional toll roads. The former includes the Tg. Perak-Waru section of Surabaya-Gempol Toll Road, Central North-South Toll Road, Eastern Ring Road and Gresik-Driyorejo Toll Road. The latter includes the Waru-Gempol section of Surabaya-Gempol Toll Road, Surabaya-Mojokerto Toll Road, Surabaya-Gresik Toll Road and the Outer Ring Road.

In principle, it was assumed to apply a flat tariff to the intra-urban toll roads and a distance proportional tariff to the inter-regional toll roads. According to the present toll road plans for the Central North-South Toll Road and Eastern Ring Road, they are neither to connect to each other nor to connect with Tg. Perak-Waru section of Surabaya-Gempol Toll Road. This is considered to be mainly because the respective toll road investors prefer to collect the tolls independently rather than to share the total toll revenue between them. In determining the future toll collection system for the whole road network, flat tariff toll roads were assumed to operate independently without direct connection with other toll roads.

The toll rate of the planned toll road network in SMA is based on the investor's proposal and the prevailing rate of the current toll roads in Indonesia. As a result of consultation with Bina Marga, the toll collection system and the toll rate were assumed as shown in Figure 10.2.1.

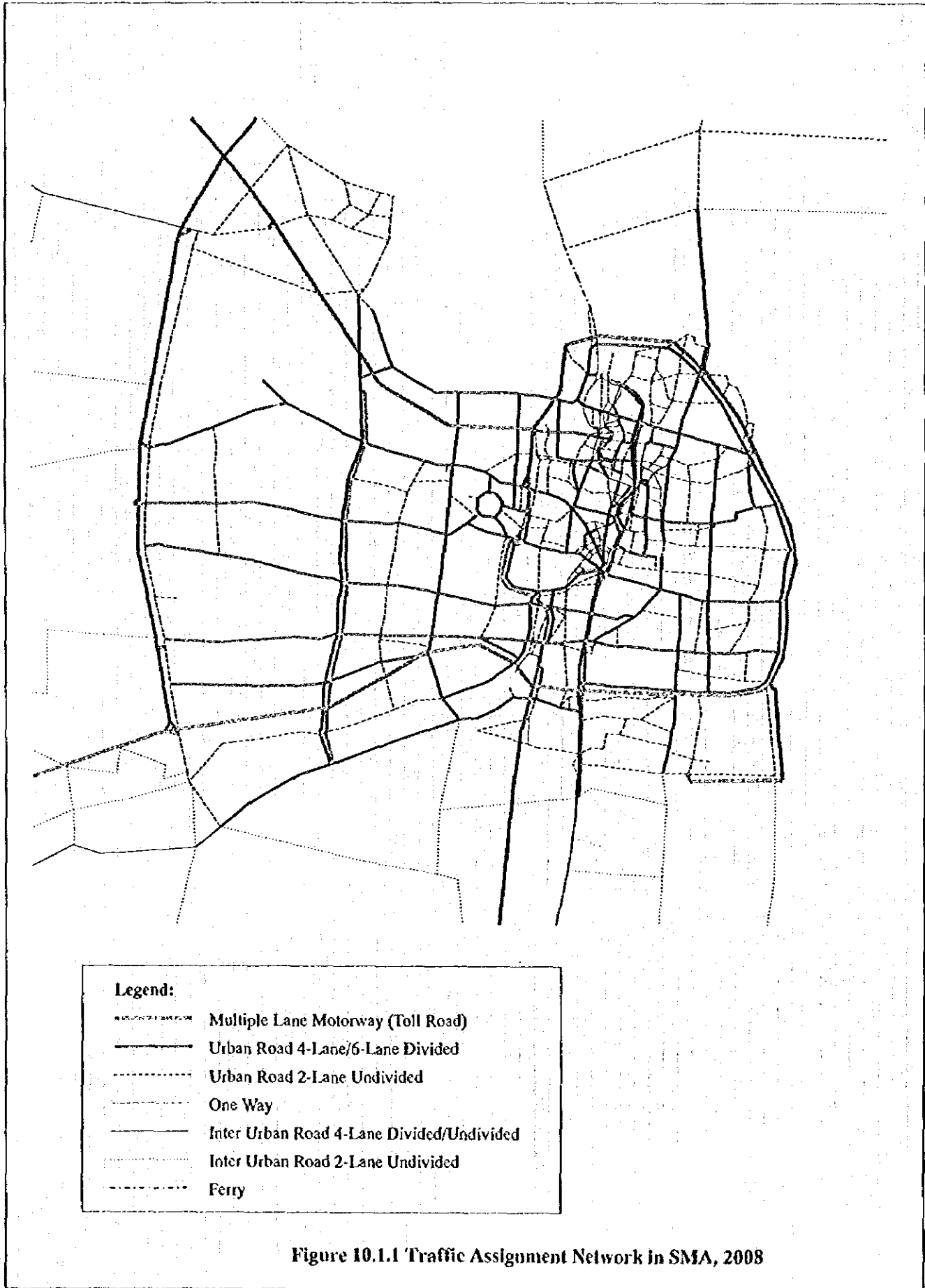


Figure 10.1.1 Traffic Assignment Network in SMA, 2008

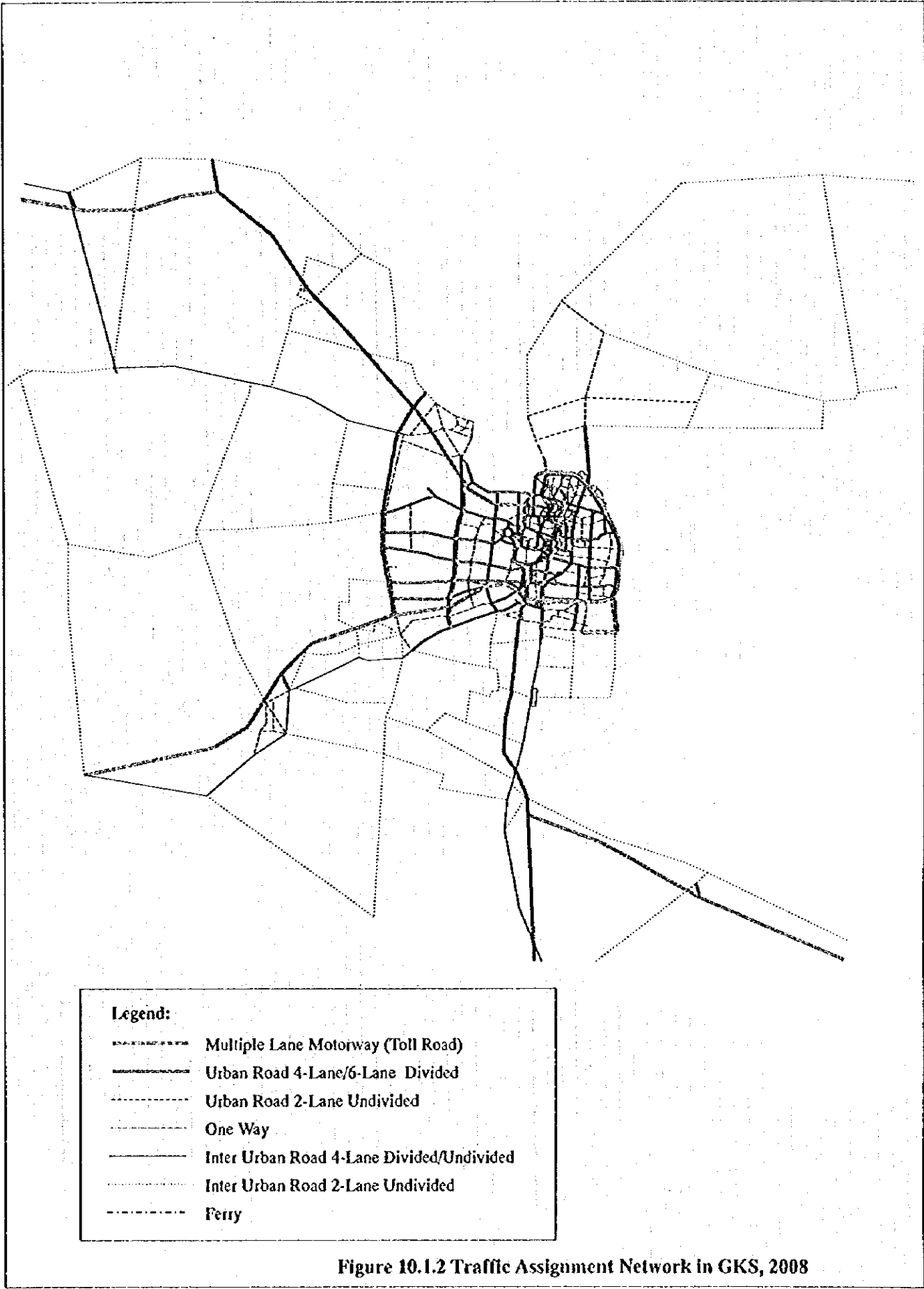


Figure 10.1.2 Traffic Assignment Network in GKS, 2008

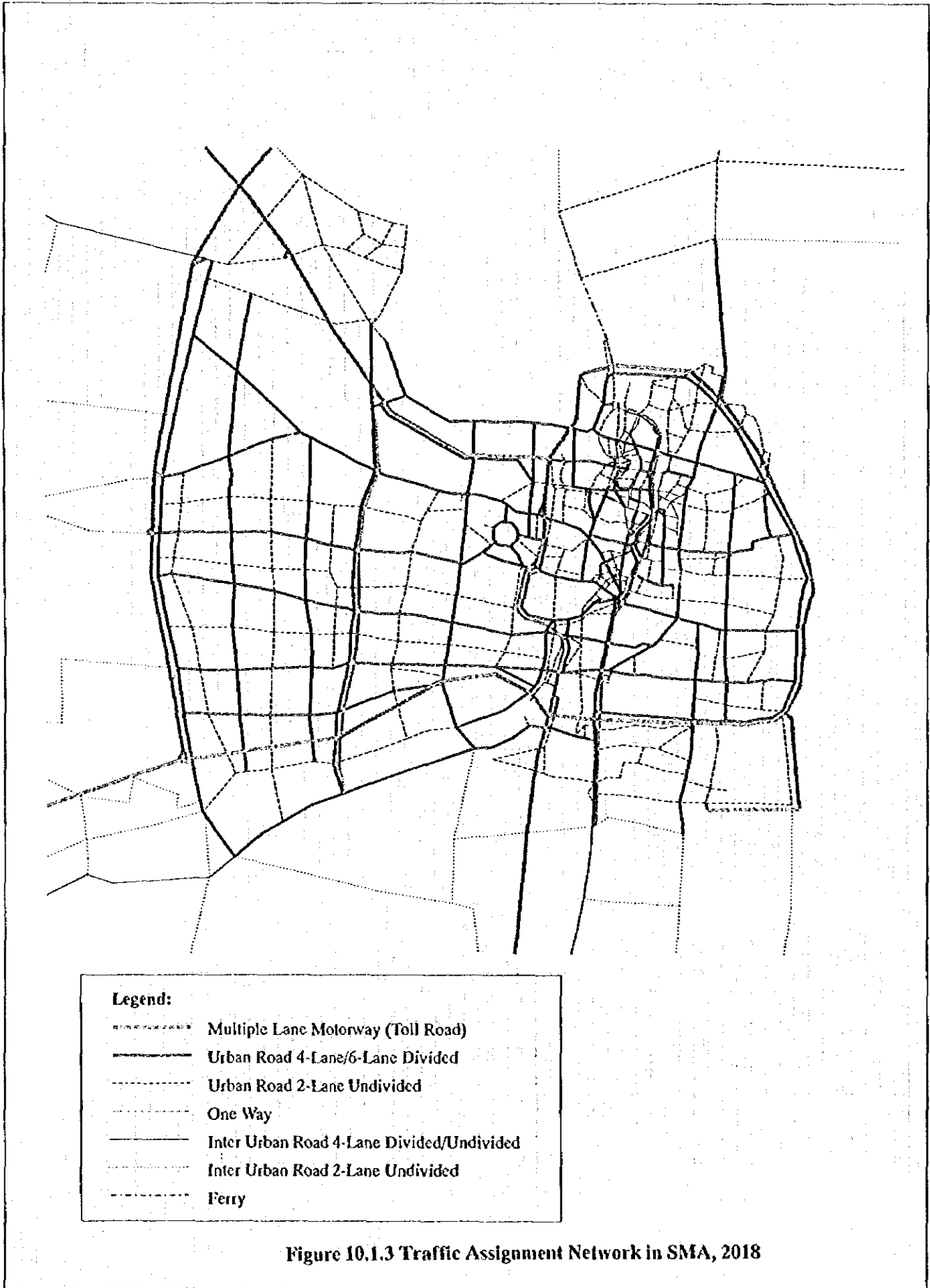


Figure 10.1.3 Traffic Assignment Network in SMA, 2018

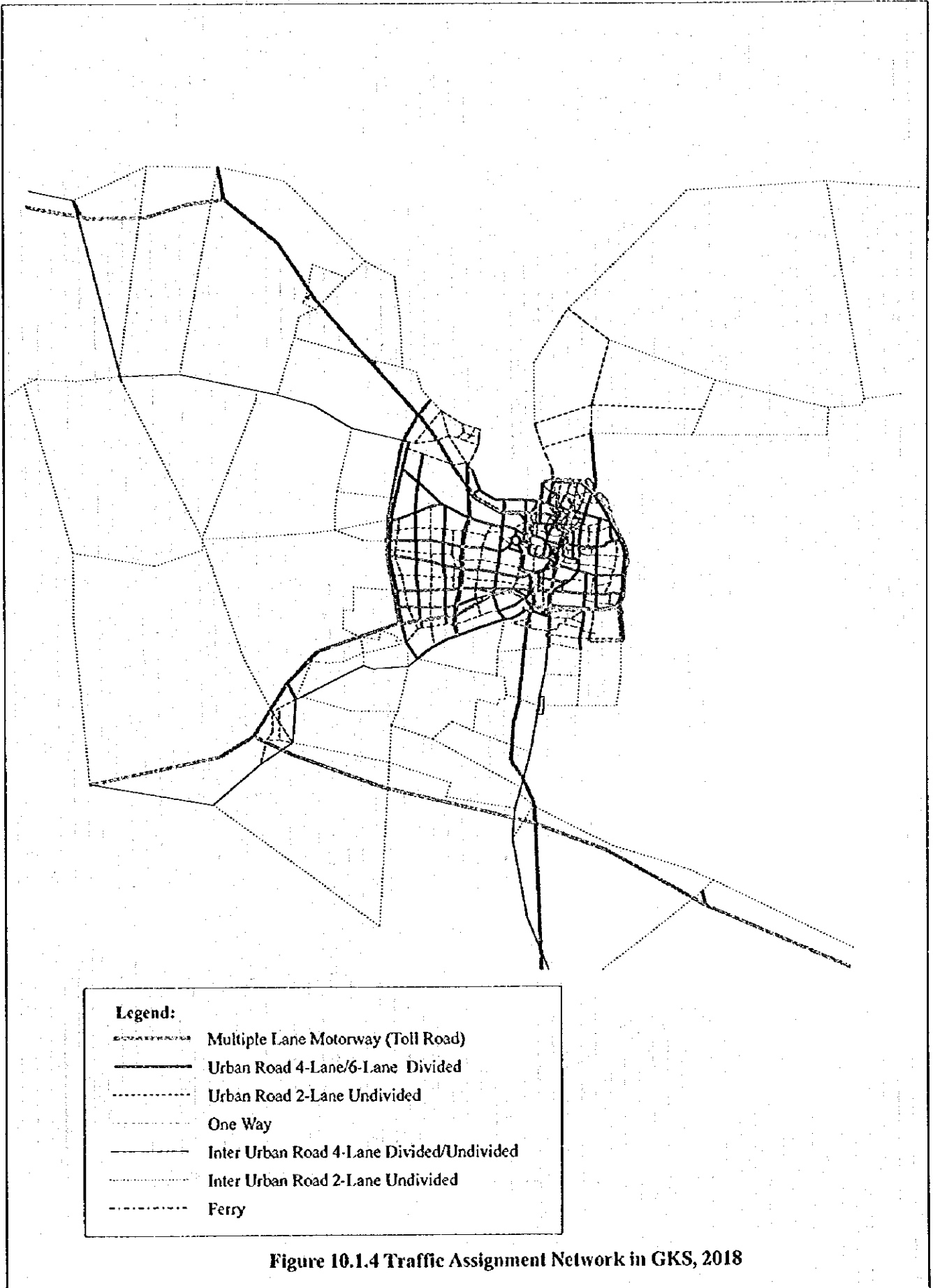


Figure 10.1.4 Traffic Assignment Network in GKS, 2018



Legend:			
— (thick solid line)	Flat Tariff (Rp. 2,500)	— (solid line)	Urban Road 4-Lane/6-Lane Divided
— (medium solid line)	Flat Tariff (Rp. 2,000)	— (dotted line)	Urban Road 2-Lane Undivided
— (thin solid line)	Flat Tariff (Rp. 4,500)	— (solid line with arrow)	One Way
— (dashed line)	Distance Proportion Tariff (Rp. 150/Km)	— (solid line)	Inter Urban Road 4-Lane Divided/Undivided
		— (dotted line)	Inter Urban Road 2-Lane Undivided
		— (dashed line)	Ferry

Figure 10.2.1 Toll Collection and Toll Rates

### 10.3 Link Speed and Capacity

Traffic assignments have been made by the minimal time path method. Determinants of the travel time are the link distance and vehicle speed. The vehicle speed is derived from the saturation level that compares the road capacity and the traffic volume assigned on to the network links.

A speed decay curve corresponding to traffic saturation levels (volume/capacity ratios) has been defined as presented in Table 10.3.1.

**Table 10.3.1 Speed Decay Curve**

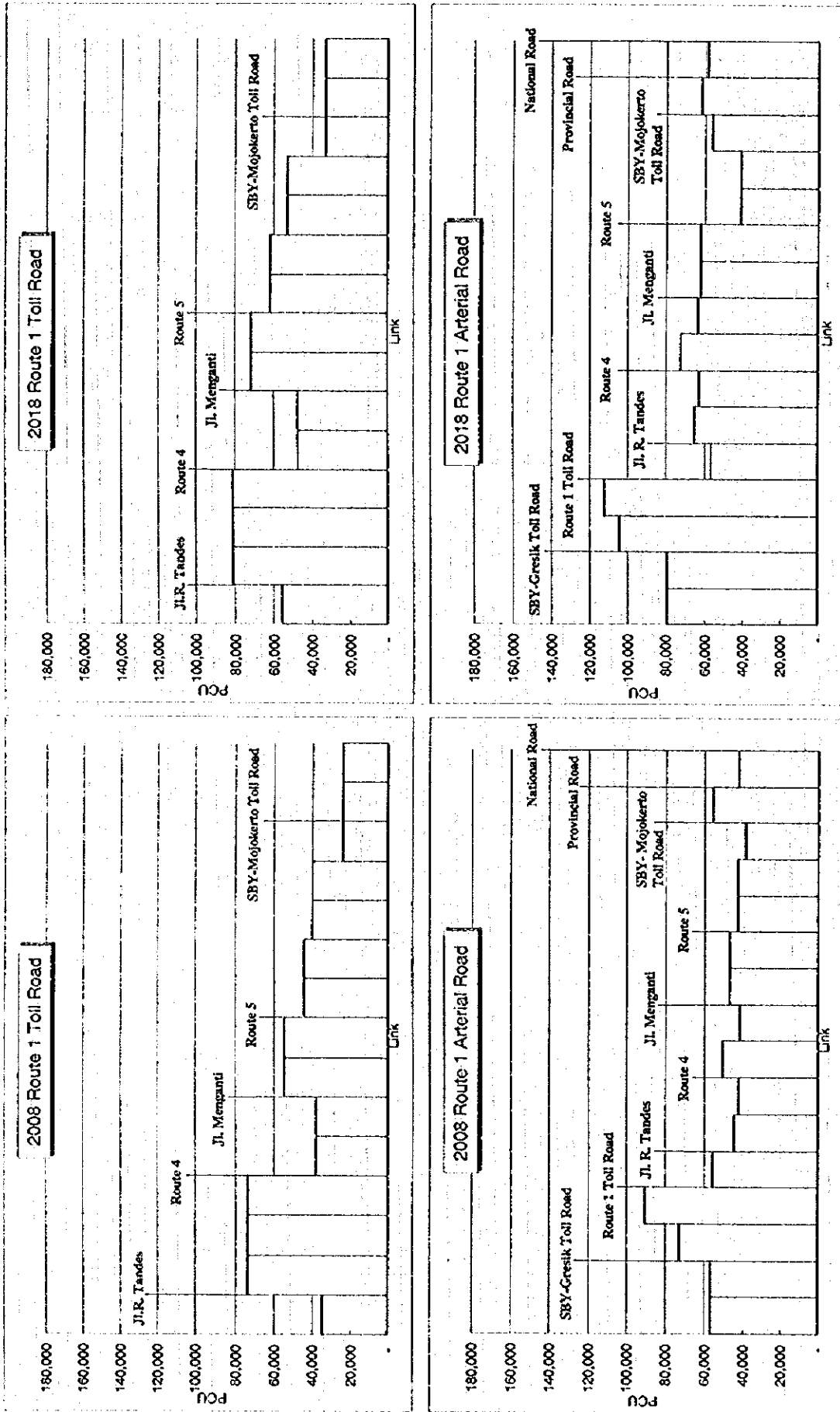
Road Classification		Free Flow Speed (Km/hour)	Volume/Capacity Ratio				
			0.0	0.5	1.0	1.5	2.0
Toll Road		100	1.00	0.88	0.50	0.30	0.10
Inter-regional Roads	2-lane undivided	70	1.00	0.80	0.57	0.34	0.10
	4-lane (un)divided	80	1.00	0.88	0.53	0.32	0.10
Urban Roads	2-lane undivided	42	1.00	0.85	0.50	0.30	0.10
	4(6)-lane divided	54	1.00	0.85	0.50	0.30	0.10
	One-way road	54	1.00	0.85	0.50	0.30	0.10

Source: JICA Study Team

An impedance of the toll rate was imposed on to a dummy link of the toll road network and this was converted to a travel time additional to the estimated link travel time. This additional time as the penalty of toll was determined using a vehicle time value in financial terms and the relevant toll rate. The vehicle time value is analyzed in Chapter 17 "Economic Project Analysis".

### 10.4 Assigned Traffic Volume on Project Roads

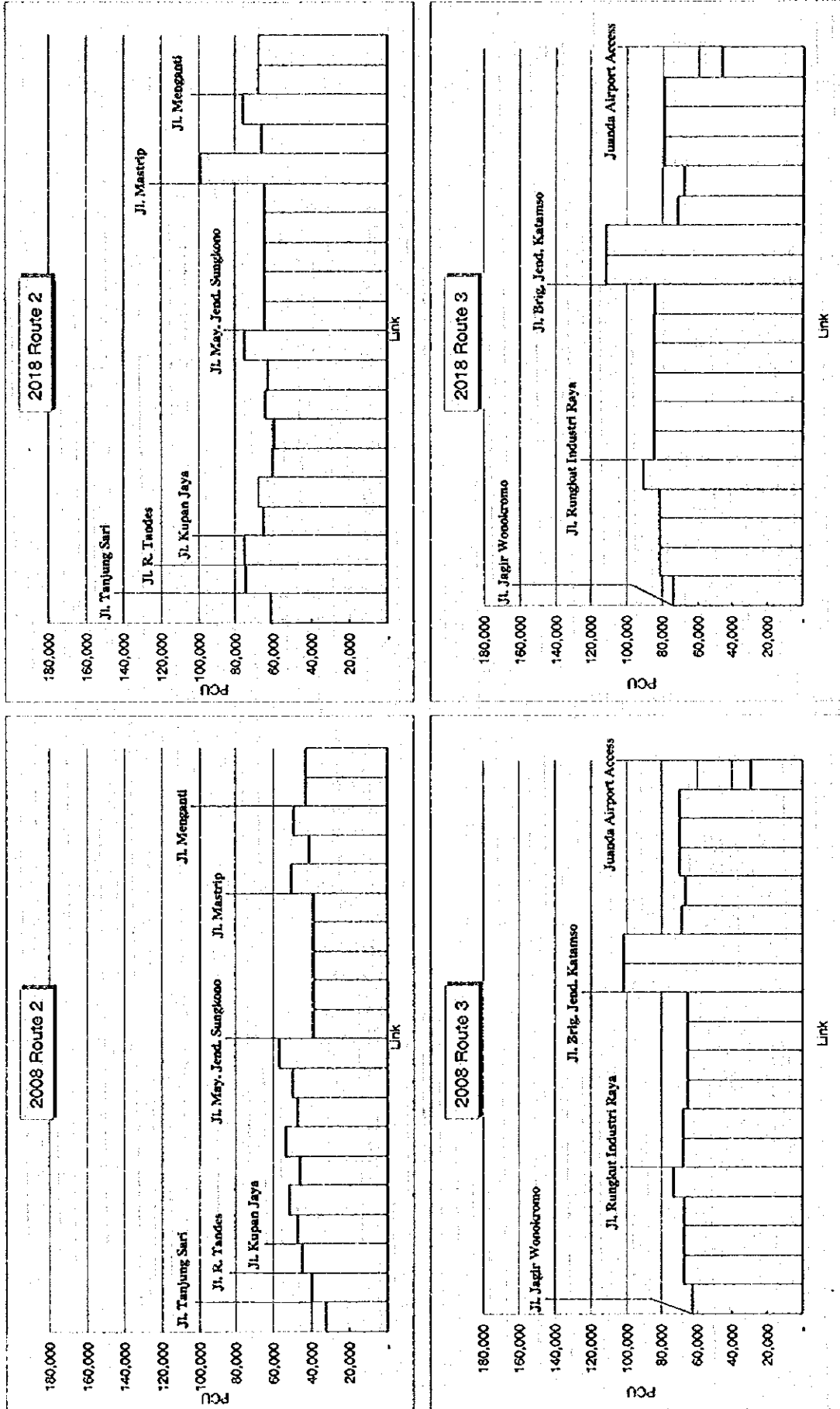
Under the condition of the road network above, the estimated 2008 and 2018 vehicle O-D traffic (tables) was assigned to the respective road networks, and the results are presented in Figure 10.4.1.



Source: JICA Study Team

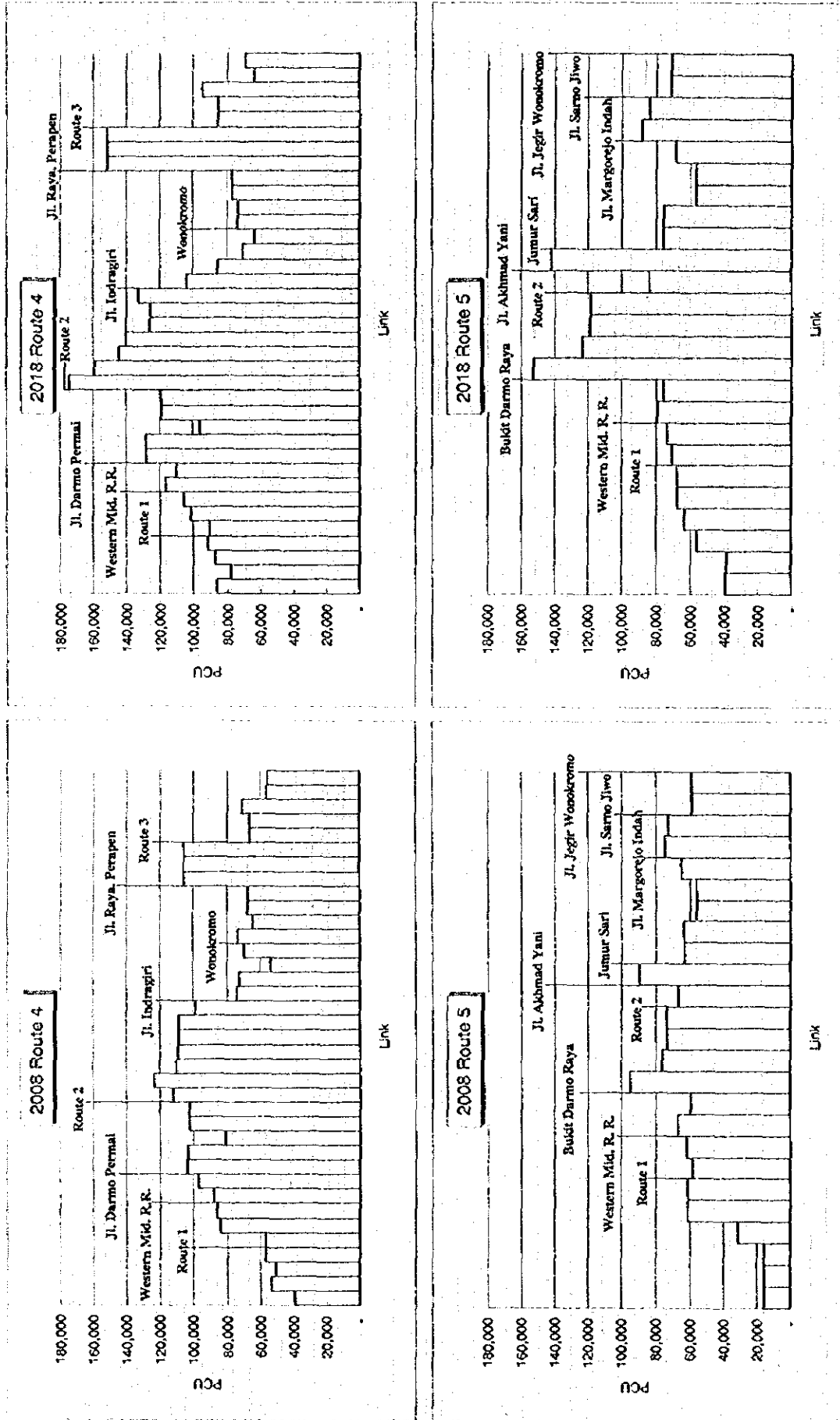
Figure 10.4.1 Estimated Traffic Volume on Project Roads (1/3)





Source: JICA Study Team

Figure 10.4.1 Estimated Traffic Volume on Project Roads (2/3)



Source: JICA Study Team

Figure 10.4.1 Estimated Traffic Volume on Project Roads (3/3)