CHAPTER 18 PROJECT FINANCIAL ANALYSIS

CHAPTER 18

PROJECT FINANCIAL ANALYSIS

18.1 General

(1) Methodology

The principal objective of the project financial analysis is to evaluate the financial viability of the implementation of the construction and operation of the proposed Gresik - Driyorejo Toll Road Project (a part of the toll road in Route-1).

This analysis has been performed based on estimations in terms of revenues and construction and operation / maintenance costs. Additionally, financial conditions of the required funds have been examined and assumed.

Based on the said estimations and assumptions the profit and loss statement and the cash flow were tabulated, and the first year of continuous annual surplus and continuous accumulated surplus were examined. As the evaluation indicators of financial viability, the financial internal rate of return (FIRR) and net present value (NPV) are demonstrated.

For calculation of FIRR, Return on Investment (ROI) and Return on Equity (ROE) were examined. ROI is an indicator which measures a return on the total investment regardless of fund raising conditions, while ROE is an indicator in which a return on equity invested is estimated taking fund raising conditions into account.

(2) Basic Assumptions

The following assumptions were made:

1) Management Body

The construction and operation of the Toll Road will be performed by a joint venture corporation comprising private investors and Jasa Marga with a BOT (Build, Operate and Transfer) scheme.

2) Implementation Schedule

The implementation schedule is assumed to be 1998 to 2003:

Design	:	1 year
Land acquisition	:	2 years
Construction	:	3 years
Total	:	6 years

3) Project Life

The start of operation of the whole of the Toll Road is scheduled to be 2004. The project life is assumed to be 30 years after inauguration of the whole operation of the Toll Road.

18.2 Revenue Estimation

18.2.1 Tariff and Tariff Collection System

Two toll roads are now in operation in Surabaya. One is Surabaya-Gempol Toll Road and the other is Surabaya-Gresik Toll Road. The former comprises different operation systems, i.e. an open system between Tg. Perak and Waru (about 16 kilometers) at a flat tariff of Rp. 1,000 per Category I vehicle, and a closed system between Waru and Gempol at a distance proportional tariff of Rp. 2,000 per Category I vehicle (about 26 kilometers). The latter is also operated with the combination of open and closed systems at a flat tariff of Rp. 500 for Dupak - Tandes section (about 3.5 kilometers) and a closed system for Tandes - Kebomas section at a distance proportional tariff of Rp. 2,500 (about 16 kilometers).

Besides these presently operating toll roads, some toll roads projects are being developed in Surabaya and its surrounding area. These are the Eastern Surabaya Ring Toll Road, the Surabaya - Mojokerto Toll Road and the Central North - South Toll Road. Termini of the toll roads are closely located but are not directly connected to each other in order to enable the toll road operators to collect their toll revenue independently and exclusively.

The proposed Gresik - Driyorejo Toll Road is planned mostly inside Surabaya City and its corridor has been developed as a suburban area of Surabaya. Also the area is planned to expand further west to form the Surabaya Metropolitan Area together with a sub-city center in the toll road corridor area. In the urbanized area where large traffic demand and high land acquisition costs are assumed, it is convenient as well as economical for both toll road users and operators to apply the open system with a flat tariff. Accordingly, the open system with flat tariff has been adopted for the Gresik - Driyorejo Toll Road following discussions with Bina Marga. To keep operational independence and to avoid the complexity of revenue sharing among the toll roads operators, the toll road is planned to not directly connect with either Surabaya-Gresik Toll Road or Surabaya-Mojokerto Toll Road.

Tariffs for the toll roads being developed, such as the Eastern Surabaya Ring Toll Road and the Central North - South Toll Road has been determined as the result of negotiation between the toll road investor and the Government, and are Rp. 2,500 and Rp. 4,500 respectively for Category I vehicle. The latter is derived from the expensive construction cost of elevated toll road.

The existing Tg. Perak - Waru section of Surabaya-Gempol Toll Road is operated at the flat tariff of Rp. 1,000 for Category I vehicle. Compared to the level of toll tariff in Jakarta, that is the Intra-Urban Toll Road being operated at Rp. 3,000, the tariff of Rp. 1,000 is inexpensive for the Tg. Perak - Waru Toll Road Section. Recently, it has been planned by Jasa Marga to widen the existing 4-lane carriageway to a 6-lane carriageway. Through discussions with Bina Marga it has been agreed to assume that the tariff will increase to Rp. 2,500 after completion of the widening.

Taking the above into consideration, for Gresik - Driyorejo Toll Road a tariff of Rp. 2,500 for Category I vehicles was considered appropriate, and proportionally to the existing differential between vehicle categories, Rp. 3,750 and Rp. 5,000 for Category IIA and IIB vehicles respectively at 1997 price level.

Applying the most prevailing factor of tariff increase proposed by investors, which is mainly explained by the cost-push element anticipated for the future, the toll tariff is assumed to increase 17% every two years. The rate of increase up to the year of toll road operation from 1997 was assumed to be 8% per annum.

18.2.2 Toll Revenue

The toll revenue is calculated based on the tariff and the estimated number of toll road users /vehicles. The vehicle categories of sedan, truck and bus in the traffic assignment are not necessarily compatible with tariff categories I, IIA and IIB respectively. All the sedan type vehicles belong to Category I, but trucks and buses should be divided into further classifications. Pick-ups or mini-buses are classified as Category I, 2-axle trucks larger than pick-ups or medium buses as Category IIA, and 3-axle or larger trucks or large buses as Category IIB.

Based on traffic compositions observed which most closely resemble the planned toll road, the tariff categories corresponding to the estimated vehicle types were estimated as follows:

Vehicle Type	Category I	Category IIA	Category IIB
Sedan / Minibus	100%	-	-
Truck	20%	40%	40%
Large Bus	-	100%	-

Accordingly the weighted average of the toll tariff for each vehicle type has been estimated as follows:

Vehicle Type	Weighted Average Toll Tariff (at 1997 price)
Sedan / Minibus	Rp. 2,500
Truck	Rp. 4,000
Large Bus	Rp. 3,750

According to the traffic assignment results in the traffic demand forecast, there is no traffic volume of bus (regardless of minibus / large bus and public / private). Buses use a part of the arterial road in Route-1. (Actually, some tourism buses are anticipated on the Toll Road. However, the number of such buses is considered negligibly small. As a result, in this financial analysis, buses were excluded in the revenue calculation.)

Based on the results of the traffic assignment and the assumed tariff, the toll revenues for the planning years have been estimated as follows:

Unit: Million Rp. (Vehicle)

Year	:	Passenger Car		Truck		Total Revenue	
2008	:	135,877	(63,096)	16,443	(4,793)	152,320	(67,889)
2018	:	359,382	(75,739)	90,993	(12,043)	450,375	(87,782)

Note: Figures in ( ) stand for the number of toll users (vehicle basis).

Regarding the traffic volumes, the following assumption were made:

The traffic volumes in the intermediate years during 2008 - 2018 were interpolated and those during 2004 - 2008 and after 2018 were estimated using the growth rate during 2008 - 2018, and those after 2025 were held constant.

18.3 Project Financial Costs

18.3.1 Project Costs

Based on the study results of cost estimates (refer to Chapter 16), the project financial costs related to the initial investment at 1997 constant price has been estimated as summarized in Table 18.3.1.

Table 18.3.1 Financial Initial Investment Costs at 1997 Constant Price

(Million Rp. at 1997 Prices)

Design	18,003
Construction	600,113
Toll Equipment	3,328
Supervision	42,008
(Subtotal)	(663,452)
Land Acquisition	53,136
(Total)	(716,588)

Source : Estimated by the Study Team.

Price escalation of 6% per annum was assumed for each cost item, and the financial escalated annual initial investment costs in accordance with the implementation schedule is shown in Table 18.3.2.

Table 18.3.2 Financial Escalated Annual Initial Investment Cost

(Million Rp.)

	1998	1999	2000	2001	2002	2003	Total
Design	19,083						19,083
Construction				252,543	267,696	283,756	803,995
Toll Equipment						4,721	4,721
Supervision				17,678	18,739	19,862	56,279
(Subtotal)	(19,083)			(270,221)	(286,435)	(308,329)	(884,078)
Land Acquisition		29,852	31,643				61,495
TOTAL	19,083	29,852	31,643	270,221	286,435	308,339	945,573

Source : Estimated by the Study Team.

Regarding the toll equipment cost and the overlay cost, reinvestment was assumed every ten years with a price escalation rate of 6% per annum. The estimated financial operation and maintenance costs in 1997 constant prices are Rp. 4,642 million, and the annualized operation and maintenance costs were estimated using a price escalation rate of 6% per annum.

18.3.2 Assumption on Options for Initial Investment Costs

Here, some options regarding the initial investment costs are discussed.

The Gresik - Driyorejo Toll Road has sections of access roads as below:

a) Northern part : about 4.8 Km

b) Southern part : about 0.5 Km

These access roads function both as the access road to the toll road and as the arterial road. Management of the access roads will be transferred to the proper authority concerned after completion.

One option regarding the initial investment costs is conceived as the case in which the initial investment costs (construction and land acquisition costs) related to such access roads are

excluded from the Project cost. (The Project costs mentioned previously in Section 18.3.1 include such access roads.) Such option has the effect that the cost burden of the initial investment related to the access roads will be relieved for the joint venture corporation. That is, such a cost relief is considered as a kind of incentive to the joint venture corporation. In this financial analysis, two options are assumed as below:

a) Option case-1:

Excluding half of the costs of construction and land acquisition related to the sections of access roads (arterial roads) to the toll road.

b) Option case-2:

Excluding all the costs of construction and land acquisition related to the sections of access roads (arterial roads) to the toll road.

While the option case-1 is the case of 50% exclusion of the construction and land acquisition costs related to the sections of access roads (arterial roads) to the toll road., the option case-2 is the case of 100% exclusion. A comparison of the initial investment costs among the base case, option case-1 and option case-2 is summarized in Table 18.3.3.

The above cases are examined later in Section 18.4.3.

Table 18.3.3 Comparison of Initial Investment Costs among Base Case, Option Case-1 and Option Case-2 at 1997 Constant Prices

(Million Rp. at 1997 Prices)

	Base Case	Option Case-1	Option Case-2
Design	18,003	15,543	13,082
Construction	600,113	518,087	436,061
Toll Equipment	3,328	3,328	3,328
Supervision	42,008	36,266	30,524
(Subtotal)	(663,452)	(573,224)	(482,995)
Land Acquisition	53,136	48,486	43,836
TOTAL	716,588	621,710	526,831

Source : Estimated by the Study Team.

18.4 Cash Flow Analysis

18.4.1 Profit and Loss Statement

For the cash flow analysis of the Project the profit and loss statement has been estimated based on the following assumptions:

1) Toll Revenues

For toll revenues refer to Section 18.2.2.

2) Revenue Sharing to Jasa Marga

The revenue sharing to Jasa Marga is assumed as below:

a) 1st - 10th year (2004 - 2013) : 0% of the toll revenues
b) 11th - 15th year (2014 - 2018) : 5% of the toll revenues
c) 16th - 20th year (2019 - 2023) : 10% of the toll revenues
d) 21st - 25th year (2024 - 2028) : 15% of the toll revenues
e) 26th - 30th year (2029 - 2033) : 20% of the toll revenues

3) Other Income

Other Income includes billboard advertising revenue and commercial space rental at the rest areas adjacent to the toll road. Other Income is conservatively estimated to be Rp. 2 billion and is constant.

4) Buy Out Revenue

The buy out revenue means the bought value of the toll road facilities by Jasa Marga at the final year of the concession period. In this financial analysis, however, no buy out revenue is assumed at the final year of the concession period.

In this case the investor will transfer the assets to Jasa Marga almost free of charge except for small amounts of toll equipment and overlay works paid in the year 2033 at the end of concession period. Though the investor may wish to transfer the assets to Jasa Marga based on appraised costs due to improved profitability of this BOT project, the value of the corporate assets will not be appraised at the end of the concession period.

5) Operation and Maintenance Costs

For operation and maintenance costs refer to Section 18.3.

6) Overhead Costs

Overhead costs are assumed at 20% of the annual operation and maintenance costs.

7) Property Tax

Property tax is charged both for the land of the carriageway of the toll road and for the buildings / structures related to the toll road. The annual value of the property tax has been estimated based on the actual data of property tax of the existing Surabaya - Gempol Toll Road. According to information obtained from Jasa Marga the actual 1997 property tax of the Tg. Perak - Waru section of the Surabaya - Gempol Toll Road (total length of about 16 Km with a carriageway of about 31 m) is Rp. 600 million, that is equivalent to about Rp. 1,200 per square meter.

Applying this unit rate of property tax per square meter, the 1997 property tax of the Gresik - Driyorejo Toll Road is estimated to be Rp. 614 million (Rp. 1,200×length of 15.5 Km× width of carriageway of 33m).

8) Depreciation

Depreciation follows the straight line method. The life expectancy for each facility is assumed as follows:

a) Toll Road	:	20 years
b) Toll Equipment	:	5 years
c) Overlay	:	5 years
d) Land	:	5 years
e) Interest during Construction	:	30 years

9) Interest (Long-term Loan)

Payment of interest for the long-term loan is assumed to be made for the average of the beginning balance and the ending balance of the loan. Details of the loan conditions are described later in the following section.

10) Interest (Short-term Loan)

Payment of interest for the short-term loan is assumed to be made for the remaining balance of the loan. Details of the loan conditions are described later in the following section.

11) Foreign Currency Loss

The Rupiah devaluation rate is assumed to be 4% per annum. Foreign currency losses are estimated at the amount of 4% of the remaining balance of the off-shore loan.

12) Corporate Tax

Corporate tax is assumed to be charged after the accumulated profit (after depreciation) becomes positive. In this case, an annual loss is assumed to be carried over for the ensuing five years. The tax ratio is assumed to be 30% of the profit after depreciation.

18.4.2 Financial Cash Flow Analysis

(1) Assumption of Financial Source and Use

1) Financial Source

The items of financial source has been assumed as follows:

a) Equity
b) Long-term loan
c) Toll revenue
d) Other income

2) Financial Use

The items of financial use have been assumed as follows:

a) Investment costs (initial and additional)
b) Interest during construction
c) Principal repayment of long-term loan
d) Interest payment of long-term loan
e) Foreign currency loss
f) Principal repayment of short-term loan
g) Interest payment of short-term loan
h) Operation and maintenance costs
i) Overhead costs
j) Revenue sharing to Jasa Marga
k) Property tax
l) Corporate tax

3) Assumption of Short-term Loan

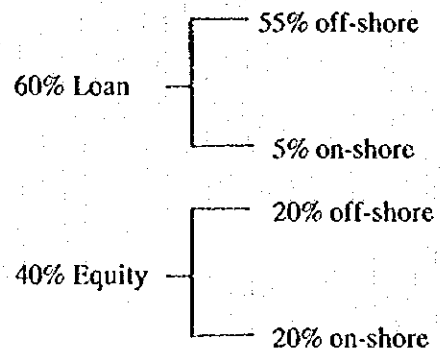
It has been assumed that in the case of a cash flow deficit of the total financial source against the total financial use, the deficit is financed by a short-term loan. The repayment of principal and payment of interest have been assumed to be made in the year following the borrowing. The interest rate of short-term loan has been assumed to be 20% per annum.

(2) Assumption on Fund Raising (Equity / Loan Ratio)

Sources of cash flow for the initial investment costs are provided by equity and loan (long-term loan). The equity is drawn down to finance the initial investment costs, mainly consisting 100% of the land acquisition cost and some portion of the construction costs from the year 1998 through 2002. The long-term loan is drawn down to finance the initial investment costs mainly consisting of major portion of the construction costs from the year 2001 through 2003.

1) Equity / Loan Ratio

The equity / loan ratio has been assumed as equity : 40% and loan : 60%. Regarding the details of equity and loan on-shore / off-shore, the following assumption has been made:



As indicated in the above chart, 75% (55% offshore debt + 20% offshore equity) of the investment costs of the Gresik - Driyorejo Toll Road is assumed to be funded offshore.

2) Long-term Loan Condition

The long-term loan is assumed to comprise an off-shore loan and an on-shore loan as follows:

a) Off-shore Loan

55% of the total financial source (about 92% of the total loan) is expected to be from offshore sources, such as mainly export-import banks, denominated in US$, at an interest rate of 10% per annum. The grace period is assumed to be 3 years, and the principal repayment period 10 years.

b) On-shore Loan

5% of the total financial source (about 8% of the total loan) is expected to be from onshore sources at an interest rate of approximately 20% per annum. The grace period is assumed to be 3 years and the principal repayment period 10 years as for the off-shore loan.

As a result, the weighted average interest rate of the off-shore and on-shore loans is

estimated to be approximately 11% per annum.

18.4.3 Cases to be Examined and Analysis Results

(1) Cases to be Examined

As mentioned previously in Section 18.3.2 the following cases are examined in the financial analysis:

a) Cost Base Case: Full scale costs regarding the access roads

b) Cost Option Case-1:

Excluding half of the costs of construction and land acquisition related to the sections of access roads (arterial roads) to the toll road

c) Cost Option Case-2:

Excluding all the costs of construction and land acquisition related to the sections of access roads (arterial roads) to the toll road

In addition, cases of an equity / loan ratio of 30% : 70% are also examined for each of the above cases. As a result, six cases are examined in the financial analysis for the combination of the three cases for the initial investment costs and the two cases for the equity / loan ratio as shown below:

Cases of Financial Analysis

Cost	Equity / Loan Ratio	Case No.
Cost Base Case	40% : 60%	(a)
	30% : 70%	(b)
Cost Option Case-1	40% : 60%	(c)
	30% : 70%	(d)
Cost Option Case-2	40% : 60%	(e)
	30% : 70%	(f)

(2) Analysis Results

Table 18.4.1 shows a summary of the analysis results for the above cases.

The FIRR calculations for the "cost base case" and "cost option case-1" give about 17 - 18% for ROI and about 17 - 19% for ROE. Only in the "cost option case-2" is FIRR about 20% for ROI and 21% for ROE.

The 40%:60% equity/loan ratio case in the "cost base case" shows that the first year of annual surplus is 2009 and the first year of accumulated surplus is 2013 in the profit and loss statement. In the "cost option case-1", the first year of annual surplus is 2008 and 2009 for equity/loan ratio of 40%:60% and 30%:70% respectively; and the first year of accumulated surplus is 2011 and 2013 for equity/loan ratio of 40%:60% and 30%:70% respectively. In the "cost option case-2", the first year of annual surplus is 2007 and 2008 for equity/loan ratio of 40%:60% and 30%:70% respectively; and the first year of accumulated surplus is 2009 and 2010 for equity/loan ratio of 40%:60% and 30%:70% respectively. In the "cost option case-2", the first year of annual surplus in cash flow is 2004, i.e. the first year of operation of the Toll Road, resulting in no requirement for a short-term loan.

Table 18.4.1 Summary of Financial Analysis Results

		Cost Base Case		Cost Option Case-1		Cost Option Case-2	
Equity / Loan Ratio		40%:60%	30%:70%	40%:60%	30%:70%	40%:60%	30%:70%
Case No.		(a)	(b)	(c)	(d)	(e)	(f)
FIRR	ROI (%)	16.9%	16.9%	18.2%	18.2%	19.9%	19.9%
	NPV (Million RP.) (15% discount rate)	118,010	118,010	182,597	182,597	247,186	247,186
FIRR	ROE (%)	16.7%	17.4%	18.4%	19.1%	20.6%	21.5%
	NPV (Million Rp.) (15% discount rate)	65,591	85,708	117,875	129,435	170,206	178,823
First Year of Surplus (Year)							
1) Annual Surplus in Profit & Loss		2009	2011	2008	2009	2007	2008
2) Accumulated Surplus in Profit & Loss		2013	2016	2011	2013	2009	2010
3) Annual Surplus in Cash Flow		2012	2017	2004	2012	2004	2004
Maximum Annual Short-term Loan Amount (Million Rp.)		76,692	334,836	-	97,696	-	-
Year of Maximum Short-term Loan (Year)		2009	2011	-	2009	-	-

Source : Estimated by the Study Team.

As an example, the calculation results for the case of equity / loan ratio of 40%:60% in the "cost base case" have been tabulated. Appendix 18.1 to 18.3 show the profit and loss, the cash flow and FIRR (ROI and ROE) respectively.

18.5 Financial Evaluation

18.5.1 Consideration of Cost Option Case

As shown in Table 18.4.1, to improve the financial soundness of the proposed Toll Road, regarding the initial investment costs, "cost option case-2" is the most desirable, followed by "cost option case-1" and "cost base case".

When considering the characteristics of the access roads of the proposed Toll Road, which also function as arterial roads, it is regarded unreasonable that the joint venture corporation will bear all the costs related to the said access roads ("cost base case"). On the other hand, it is considered unrealistic that all the costs related to the access roads will be exempted for the joint venture corporation ("cost option case-2").

Accordingly, cost halving such as "cost option case-1" is considered practical. Consequently, "cost option case-1" is recommended from a financial soundness viewpoint.

18.5.2 Sensitivity Analysis

(1) Sensitivity to Cost and Revenue

1) Cases for Sensitivity Analysis

A sensitivity analysis was carried out for variations of the cost (initial investment cost) and revenue for the case of equity / loan ratio of 30%:70% in the cost option case-1, that is Case No. (d). The following cases are assumed:

Case 1 : A cost overrun of 10%.

Case 2 : A 10% decrease in revenue.

Case 3 : Combination of Case 1 and Case 2 above.

2) Analysis Results

The results of the sensitivity analysis are summarized in Table 18.4.2. As can be seen, a 10% decrease in revenue would have a slightly greater effect than a 10% increase in cost.

(2) Sensitivity to Interest Rate

1) Cases for Sensitivity Analysis

A sensitivity analysis was carried out altering the weighted average interest rate of long-term loan to 15% and 20% by changing the composition ratio of on-shore loan and off-shore loan for the case of equity / loan ratio of 30%:70% in the cost option case-1, that is Case No. (d).

2) Analysis Results

The results of the sensitivity analysis are summarized in Table 18.4.2. In case of interest rate of 15%, the first year of accumulated surplus in the profit and loss statement and the first year of annual surplus in the cash flow appear in 2016 and 2017, respectively.

In case of interest rate of 20%, the first year of accumulated surplus in the profit and loss statement and the first year of annual surplus in the cash flow both appear in 2023.

Table 18.4.2 Summary of Financial Sensitivity Analysis Results

			Cost Option Case-1					
Equity / Loan Ratio			30%:70%	30%:70%	30%:70%	30%:70%	30%:70%	30%:70%
			Base Case of (d)	Cost +10%	Revenue -10%	Cost +10% and Revenue -10%	Weighted Average Interest Rate = 15%	Weighted Average Interest Rate = 20%
Case No.			(d)	(d-s1)	(d-s2)	(d-s3)	(d-s4)	(d-s5)
FIRR	ROI	(%)	18.2%	17.4%	17.2%	16.4%	18.2%	18.2%
	NPV (Million RP.) (15% discount rate)		182,597	144,052	117,679	79,134	182,597	182,597
FIRR	ROE	(%)	19.1%	18.1%	17.8%	16.8%	17.3%	15.4%
	NPV (Million Rp.) (15% discount rate)		129,435	103,401	85,441	61,156	78,024	14,480
First year of Surplus (Year)								
1) Annual Surplus in Profit & Loss			2009	2010	2010	2012	2011	2016
2) Accumulated Surplus in Profit & Loss			2013	2015	2015	2018	2016	2023
3) Annual Surplus in Cash Flow			2012	2015	2016	2018	2017	2023
Maximum Annual Short-term Loan Amount (Million Rp.)			97,696	217,990	239,735	462,685	393,602	1,321085
Year of Maximum Short-term Loan (Year)			2009	2010	2011	2013	2011	2016

Source : Estimated by the Study Team.

18.5.3 Financial Evaluation

As mentioned in Section 18.4.3, FIRR for the "cost base case" and "cost option case-1" is about 17 - 18% for ROI and about 17 - 19% for ROE. Only in the "cost option case-2", is FIRR about 20% for ROI and 21% for ROE. These rates are similar to or lower than the prevailing level of interest

rates on loans in commercial banks in Indonesia which range from 18% to 20%.

The above comparison shows that the results of the financial analysis are not so optimistic while the prevailing level of interest rates remains.

Consequently, it is required to raise a loan fund with a possibly lower level of interest rate. To achieve this, the most likely alternative way is fund raising not domestically but off-shore.

For promoting the above, it is recommended that the Government arranges a more incentive investment environment for encouraging foreign investors.

For BOT (Build, Operate and Transfer) projects, one of the ways to achieve the above is "including a security package" in the BOT contract.

The concept of "security package" is summarized below:

In a BOT contract, both private investors and Jasa Marga make an agreement regarding such conditions as land acquisition, tariff formula, tariff approval and approval from the Indonesian Offshore Borrowing Committee.

In case that some items of agreement are not satisfied, the private investors can request some compensation from Jasa Marga.

Details of "security package" are given in the following section.

18.5.4 Security Package

The following describes suggestions for improvement of investment conditions for Indonesian toll roads to introduce foreign funds.

There are no BOT laws in Indonesia but BOT guidance (involved in tender documents) is provided by Jasa Marga. BOT guidance seems to include little security for introducing foreign investments and borrowing. The following points might be useful as a reference for Jasa Marga to diversify fund raising for this sector and to promote the introduction of new foreign funds:

(1) Land Acquisition

1) Land acquisition for a project should be completed by Jasa Marga within around two (2) years from the date of opening of the authorization agreement between Jasa Marga and the joint venture company (JVC).

2) In the event that Jasa Marga, for whatever reason, fails or is unable to acquire the necessary land for the project within the stated period as provided in 1) above, the JVC might have the option to request Jasa Marga to promptly buy out the project covering all costs and expenses incurred from the project, including, but not limited to, the land acquisition cost, all costs related to financing, the cost of the feasibility study and design work, the accrued interest paid by the JVC, and all other costs related to the project.

(2) Tariff Formula

The Study Team suggests the incorporation of the following factors into the tariff formula:

1) An adjustment formula for US$/Rp. exchange fluctuation with respect to the foreign debt portion and foreign equity, and

2) Material adverse changes in Indonesian economic indicators (for example, Consumer Price Index, etc.) might be the trigger event for extraordinary adjustment.

(3) Tariff Approval

In the event that the projected tariff is not the tariff approved by the Government or proposed adjustment to the tariff is not allowed or delayed in any manner whatsoever, Jasa Marga might have the following options, either:

1) to promptly provide a fully subordinated loan to the project to fully compensate for the differential amount between the actual revenue and projected revenue, under terms and conditions which will not cause any adverse impact on the projected economics of the project debt and equity; or

2) to promptly buy out the project covering all costs and expenses incurred from the project, including but not limited to:

outstanding debt plus actual accrued interest payable by the JVC to its lenders,

all other liabilities arising out of or in connection with the project,

the equity committed and accrued interest on such equity commitment, and

consideration to account for loss of profit on equity.

(4) Approval from the Indonesian Offshore Borrowing Committee

As indicated previously in Section 18.4.2, 75% (55% offshore debt + 20% offshore equity) of the investment costs in the case of equity / loan ratio : 40% and 60%, is planned to be funded offshore. It might be necessary for the JVC to obtain approval from the Indonesian Offshore Borrowing Committee ("Approval"), which Approval is crucial to implement the project as scheduled. The JVC might request Jasa Marga to assist in obtaining such Approval. In case of failure to obtain the Approval, the JVC might require Jasa Marga to promptly buy out the Project covering all costs and expenses incurred from the project, including but not limited to:

outstanding debt plus actual accrued interest payable by the JVC to its lenders,

all other liabilities arising out of or in connection with the project, and

the equity committed and the accrued interest on such equity commitment.

In order to avoid risks, the project might be required to devise such security packages as explained above rather than obtaining a letter of awareness issued to the Paiton project. This is because the legal effectiveness of this letter as a governmental guarantee seems to be in doubt as shown in Appendix 18.4 "Privately-funded Infrastructure Businesses in Asia and Hedge Against Risks".

CHAPTER 19 IMPLEMENTATION PLAN

CHAPTER 19

IMPLEMENTATION PLAN

19.1 General

For implementation of the project roads it is imperative to examine the executing bodies and fund sources which are considered most appropriate to the existing situation. Possible executing bodies of the project roads can be either government agencies or private investors. Fund sources will be able to be diversified among domestic and overseas capital, including governmental budget, international lending agencies and private investors.

19.1.1 Executing Bodies

(1) Toll Road

According to actual practices of toll road development in Indonesia there are three possible alternatives for selecting an executing agency. These are:

- Public Corporation Method by Government Subsidiary Finance
- Joint-venture Method by Government Subsidiary Finance and Private Investor
- Build Operation and Transfer (BOT) Method by Private Investor

In order to minimize government expenditure on infrastructure development, the policy of Indonesia's Sixth Five-Year Development Plan indicates it is best to utilize the private sector by allowing that sector to participate in public sector projects. Currently the BOT method is the most prevalent in developing toll road projects in Indonesia.

(2) Public Roads

In general, the Directorate General of Highways (Bina Marga), Ministry of Public Works is responsible for the execution of the construction of national roads which include primary arterial and primary collector roads, and roads that assure strategic value of national interests.

Local governments, such as Kotamadya Surabaya, Kabupaten Sidoarjo and Kabupaten Gresik are responsible for the execution of the construction of secondary roads within their jurisdiction. However, urban roads under the jurisdiction of Bina Marga are excluded from the responsibility of the local governments.

The Ministry of Public Works has authority over the design and construction as well as the maintenance of primary arterial and collector roads. It may, nevertheless, delegate its duties (for

the maintenance of primary arterial roads) to level I (provincial) governments and (for the design and construction of primary collector roads) to level I or level II local governments, in respect of the administrative status of the roads.

As the urbanization progresses and it extends beyond the original administrative boundary, the responsibility to coherently execute such urban road construction or maintenance becomes unclear. Current pressure on the expansion of the urban road network is steadily increasing, but the required funds and personnel of level II government are too small to satisfy the demand. Improvement of fund raising capacity through diversified revenue sources and quality personnel are essential in the mid-term or long-term aspects for local government. In the short-term aspect, however, central government (Bina Marga) should help develop the secondary system, especially in metropolitan areas such as Jabotabek and Gerbang Kertosusila.

Delay of secondary road development in metropolitan areas will eventually bring about not only a great loss to the urban economies but also serious social problems. Therefore, important metropolitan roads, though the roads are secondary functions of inter-Kabupaten roads, should in the initial stage be either constructed or maintained by Bina Marga in order to maintain vigorous metropolitan activities.

19.1.2 Fund Sources

(1) Toll Road

Private investors including PT. Jasa Marga are entirely responsible for funding, construction, operation and maintenance, if the toll road is implemented by the BOT method. In this case, loans and/or equity investment from international lending agencies such as the Overseas Economic Cooperation Fund of Japan (OECF), the Export Import Bank of Japan (EXIM Bank), the Asian Development Bank (ADB), the International Bank for Reconstruction and Development (IBRD) and local banking companies are considered as possibilities to be introduced.

(2) Public Road

Funding sources for public road development are mainly funds originated from the national revenue, foreign loans through international lending agencies as mentioned above, and bilateral government aid.

In lieu of the combined sources of national revenue and foreign loans, public road development by private investor is now emerging in large scale housing developments, such as Citra Land covering about 2000 hectare to the west of Surabaya. Public road development is not confined to local service roads within the estate, but includes arterial road development to secure access to the central area of Surabaya.

For new arterial road construction in developing areas, private investors of new housing developments can be an alternative source of funds. Following the principle of "Beneficiaries Pay", the cost of the arterial road construction can be transferred to the cost of houses or commercial facilities, etc. in the development area. After construction of the road it is transferred to the appropriate level II government for future maintenance.

In this case, there will be some options in allocating the required fund to private and public sectors, for example, the private sector may be responsible for land acquisition and the public

sector for the construction. Negotiation between government and the private investor is possible to attain the same objective.

19.2 Implementation of Project Roads

19.2.1 Route-1

Route-1 consists of a toll road and its parallel arterial road. The toll road portion should be constructed by a private investor by the BOT scheme. The Right of Way (ROW) required for the toll road is 103 meters in width to provide on/off ramps in the at-grade system.

The toll road crosses the property of Citra Land, where only 55 meters of ROW are reserved for the arterial road construction. Furthermore, part of the area adjacent to the designated 55 meters ROW has already been sold to the public. Therefore, it is almost impossible to widen the existing 55-meter ROW to 103-meter ROW. This section has inevitably been designed as a structural toll road without on/off ramp services.

The toll road corridor meets several areas of private housing developers. Actual construction, however, has not started yet in most of the area except for the Citra Land area and Low Cost Housing (Perumnas) in the Driyorejo Housing Development area (KASIBA Project). In order to acquire the land, a strong initiative by the toll road investor will be a key to involve the related housing developers, and to reduce the financial burden of the initial investment cost.

Construction of the parallel arterial portion should be the responsible of Bina Marga, since this arterial portion functions as an alternative route to the parallel toll road and also the frontage road. Furthermore, the road lies across the three local government administrations of Kotamadya Surabaya, Kabupaten Gresik and Kabupaten Sidoarjo. Therefore a strong coordination body like Bina Marga is required at the actual implementation phase.

It is desirable and essential to carry out the detailed design of the toll road and the arterial road at the same time. The construction timing may differ between the two roads, but the arterial portion should be constructed first with the toll road portion following soon after. Coordination between Bina Marga and the private investor is imperative to achieve a smooth operation for Route-1 Project.

19.2.2 Route-2

Route-2 lies within the administrative boundary of Kotamadya Surabaya. This road should be implemented by Kotamadya Surabaya as a secondary arterial road using the existing ROW of 20 meters.

Funds can be derived from a combination of available sources such as a subsidiary from the national budget, the development budget of Kotamadya Surabaya, or a two-step loan from international or bilateral lending agencies.

19.2.3 Route-3

This project road lies across the administrative boundary of Kotamadya Surabaya and Kabupaten Sidoarjo. The project is intended to upgrade the capacity and service level by widening and realigning the existing road to a 4-lane road. This will function as a primary collector road before

the Eastern Ring Road is completed and ultimately as a secondary arterial road.

Accordingly, it is recommended that the national budget is applied for the betterment of the project road and that Bina Marga delegates authority of executing the project to the provincial public works office (Dinas PU) in coordination with the public works regional office (Kanwil PU).

19.2.4 Route-4

This project road has a strategic purpose in changing the present urban structure of the Surabaya Metropolitan Area, that is, the project is intended to: (1) connect the eastern and western parts of SMA which are physically separated by Surabaya River, the Railway and Surabaya-Waru Toll Road, and further (2) foster the planned eastern and western sub-centers of Surabaya by assuring access to the urban center of Surabaya. In this sense, the project should be implemented under the responsibility of Bina Marga. The project road contains a busway in its western section from Wonokromo and therefore coordination with the Directorate General of Land Transport will be necessary.

Improvement of Wonokromo Roundabout can be identified as an independent project separate from Route-4 project, since the improvement will have a significant effect not only on the east-west connection but also on the north-west connection in Surabaya.

In addition, currently emerging projects such as the LRT plan by SITNP and the Central North-South Toll Road approved by the Government are effective here along with Route-4 project.

Various fund sources should be applied for the project implementation. Cooperation with housing developers will help reduce the investment cost of the western part of the project, where many development permits have been issued. The national budget and foreign loans should be fully utilized to realize the project under the execution responsibility of Bina Marga.

19.2.5 Route-5

This project road has a characteristic similar to Route-4, connecting the eastern and western part of Surabaya with an exclusive busway in the center of the western part (from Jl. Achmad Yani) of the project corridor. Therefore, Bina Marga is the most appropriate government agency to execute construction of the project road.

Among others, improvement of Jemur Sari Intersection can be identified as an independent project, since it contributes to not only the east-west connection but also to the north-south connection in SMA. Like Route-4 project, this intersection involves other development plans of the LRT and CNS Toll Road. Therefore, a tough initiative is required to lead the planning as well as to coordinate implementation among the various related agencies with different interests.

CHAPTER 20 CONCLUSION AND RECOMMENDATIONS FOR FEASIBILITY STUDY

CHAPTER 20

CONCLUSION AND RECOMMENDATIONS FOR FEASIBILITY STUDY

20.1 Feasibility of the Projects

The selected project roads are technically and economically feasible. Gresik-Driyorejo Toll Road in Route-1 is not so optimistic in financial viability, indicating an ROI (Return on Investment) of 18.2%, an ROE (Return on Equity) of 19.1%, and the annual surplus in profit and loss falling in the 5th year from the opening year of 2004. Efforts to reduce the cost, such as sharing the cost of access road construction with housing developers adjacent to the Toll Road, or preparing a security package to attract more foreign investors/bankers are essential to keep the toll road operation financially sound in the long term.

20.2 Implementation Plan

Most important elements for implementation of the projects are fund sources and executing agencies. These elements are summarized for the respective projects as follows:

Project Roads	Fund Source	Executing Body
Route-1 (Toll Road)	Private Sector / Housing Developer	Private Sector
(Artery)	APBN/Housing Developer	DGH
Route-2	APBD / Two-step Loan	Kotamadya Surabaya
Route-3	APBN / Foreign Loan	DGH
Route-4	APBD / Foreign Loan / Housing Developer / (APBN)*	DINAS PU-Bina Marga / DGH
Route-5	APBN / Foreign Loan / Housing Developer / (APBN)*	DINAS PU-Bina Marga / DGH

* Note: (APBN): The Project can be supported by APBN.

APPENDIX

APPENDIX

Appendix 1.1 Steering and Technical Committee Members, and Indonesian Counterparts

(1) STEERING COMMITTEE

Chairman	:	**Ir. Gandhi Harahap** (Director of Urban Road Development (BINKOT), DGH) **(Formaer Chairman:Ir. Sunaryo Sumadji)**
Secretary	:	**Ir. Janeydi R. Juni** (BINKOT)
Member	:	**Dr. Sudjana Royat** (Bureau of Urban Settlement/Housing/Spatial Plan,BAPPENAS) **Dr. Suyono Dikun** (Bureau of Transportation, BAPPENAS) **Ir. Arie Dj. Djoekardi MA** (Ministry of Environment) **Ir. Haryo Sasongko MSc.** (DG of Regional Development, Ministry of Home Affairs) **Ir. Iskandar Abubakar** (DLLA, DG of Land Transport, Ministry of Communications) **Ir. Bambang S. Priyohadi MPa** (DG of Cipta Karya) **Ir. Muksin (BINKOT)**

(2) TECHNICAL COMMITTEE

Chairman	:	**Ir. R.M.A Amirullah S.S** Chief of BAPPEDA TKI, East Jawa Province
Secretary	:	**Ir. Mohammad Irian** Chief of Planning Project and Technic Supervisor Surabaya Roads Development
Member	:	**Ir. Chaerul Djaelani** Dinas of PU Bina Marga Tk I, East Java Province **Ir. Priyo Darmawan, Msc.** BAPPEDA Tk I East Java **Ir. Slamet Soesilo** Dinas of PU Bina Marga Tk. I, East Java Province **Ir. Bagus Ngurah Raka Wibawa** Province Kanwil PU East Java **Ir. Wahid Wahyudi** BAPPEDA Tk.I, East Java Province **Ir. Gatot Suryantono** BAPPEDA Tk.I, East Java Province **Bambang Suryo Manggolo** DLLAJR Tk.I East Java Province **Ir. Hendah Sunugrobo, Msc.** Kanwil of Transportation East Java Province **Ir. Sadjarwo Soekardiman**

BAPPEDA of Kotamadya Tk.II Surabaya
Ir. Alisjahbana, MUM
BAPPEDA of Kotamadya Tk.II Surabaya
Ir. Warsito
BAPPEDA of Kabupaten Tk.II Sidoarjo
Ir. Fikri Setyawan, SH
BAPPEDA of Kabupaten Tk.II Sidoarjo
Ir. Kurtini Hanafifa, Msp.
BAPPEDA of Kabupaten Tk.II Bangkalan
Sastro Suwito, SH
BAPPEDA of Kotamadya Tk.II Mojokerto
Ir. Adam Bachtiar
BAPPEDA of Kabupaten Tk. II Lamongan
Drs. A Jachya
BAPPEDA of Kabupaten Tk. II Lamongan

(3)COUNTERPARTS

Project Manager	:	**Ir. Bernaldy(BINKOT)** **(Former Project Manager: Ir. Lilla Noerhayati)**
Project Officer	:	**Ir. Palgunadi (BINKOT)**
Engineer/Planner	:	**Ir.Bisma (BINKOT)**
Local Counterparts	:	**Technical Committee members functioned as part-time counterparts as required in the Study.**

A STUDY FOR ARTERIAL ROAD SYSTEM DEVELOPMENT
IN GERBAN KERTOSUSILA REGION

Figure A3.1.1 Indesx Map of Road Inventory Survey in SMA

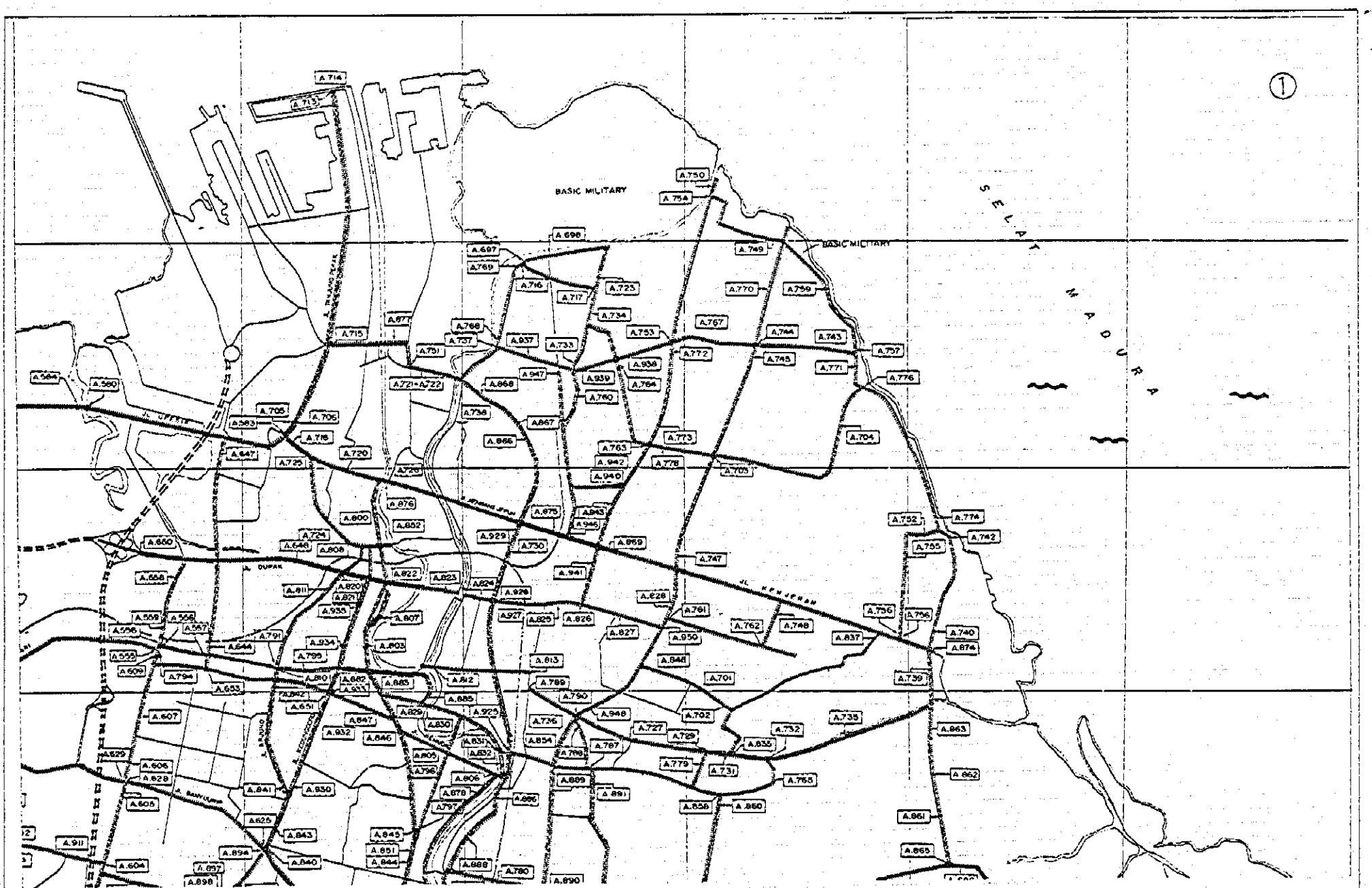


Figure A3.1.2 Road Inventory Survey Map in SMA ①

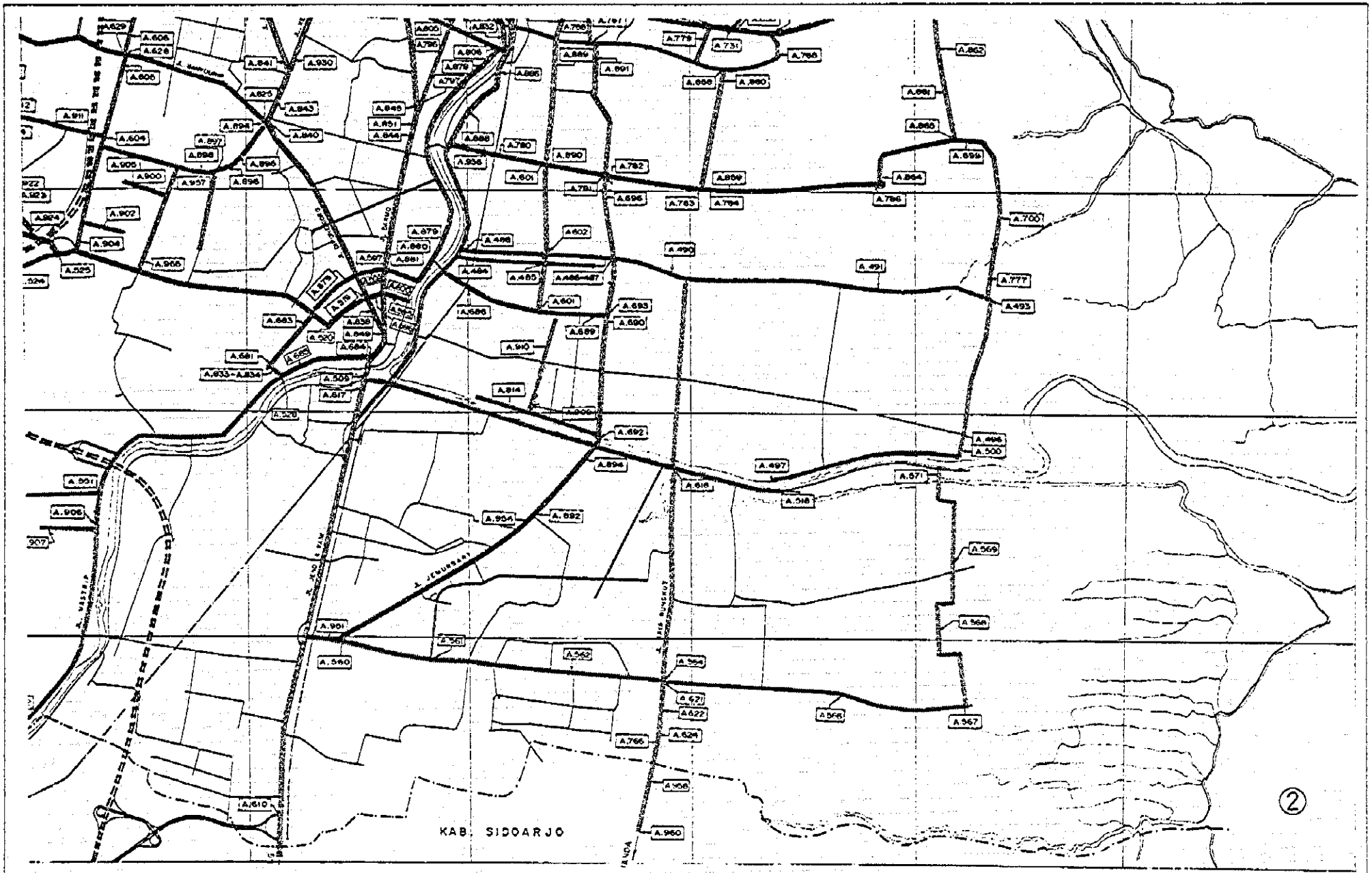


Figure A3.1.3 Road Inventory Survey Map in SMA ②

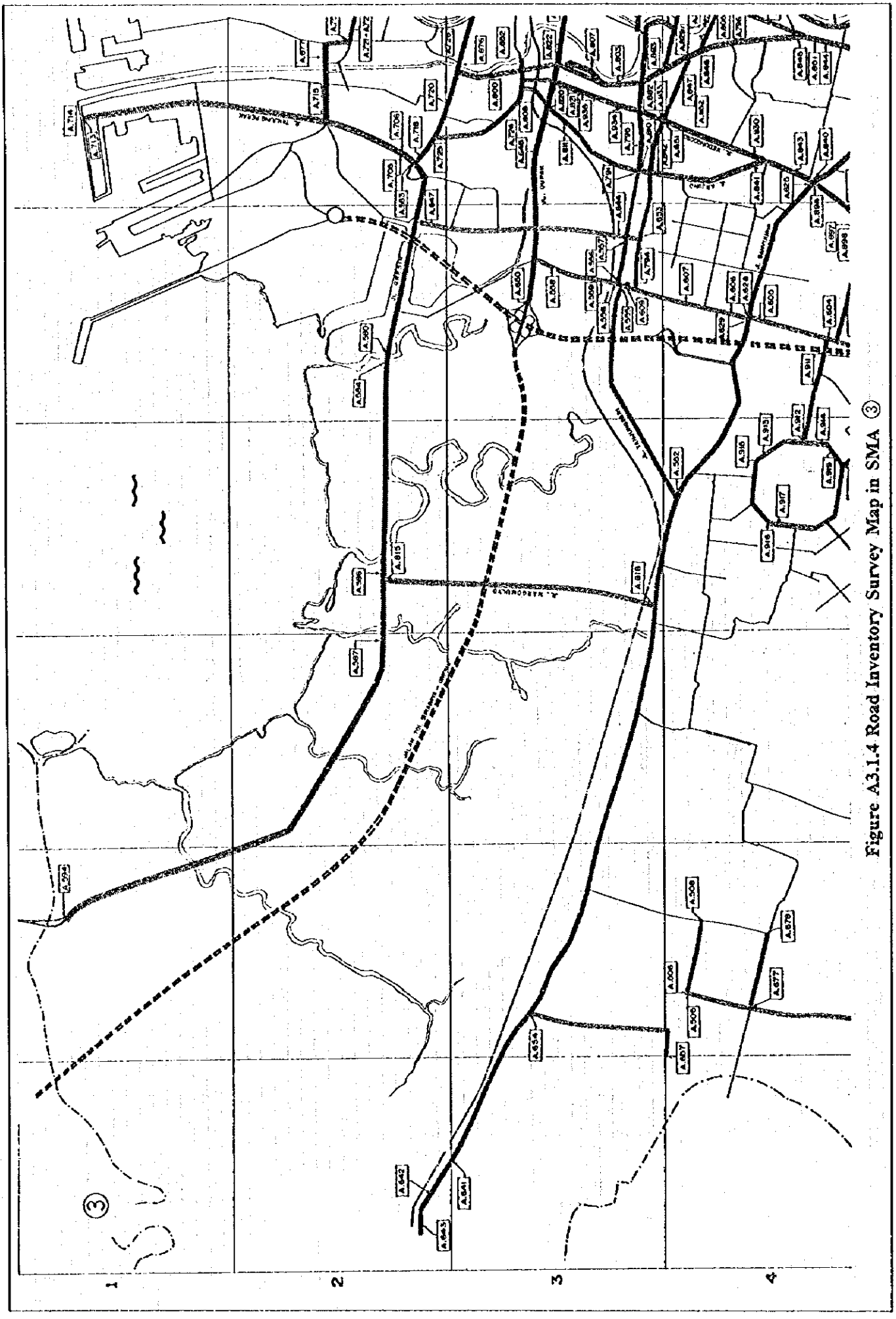


Figure A3.1.4 Road Inventory Survey Map in SMA ③

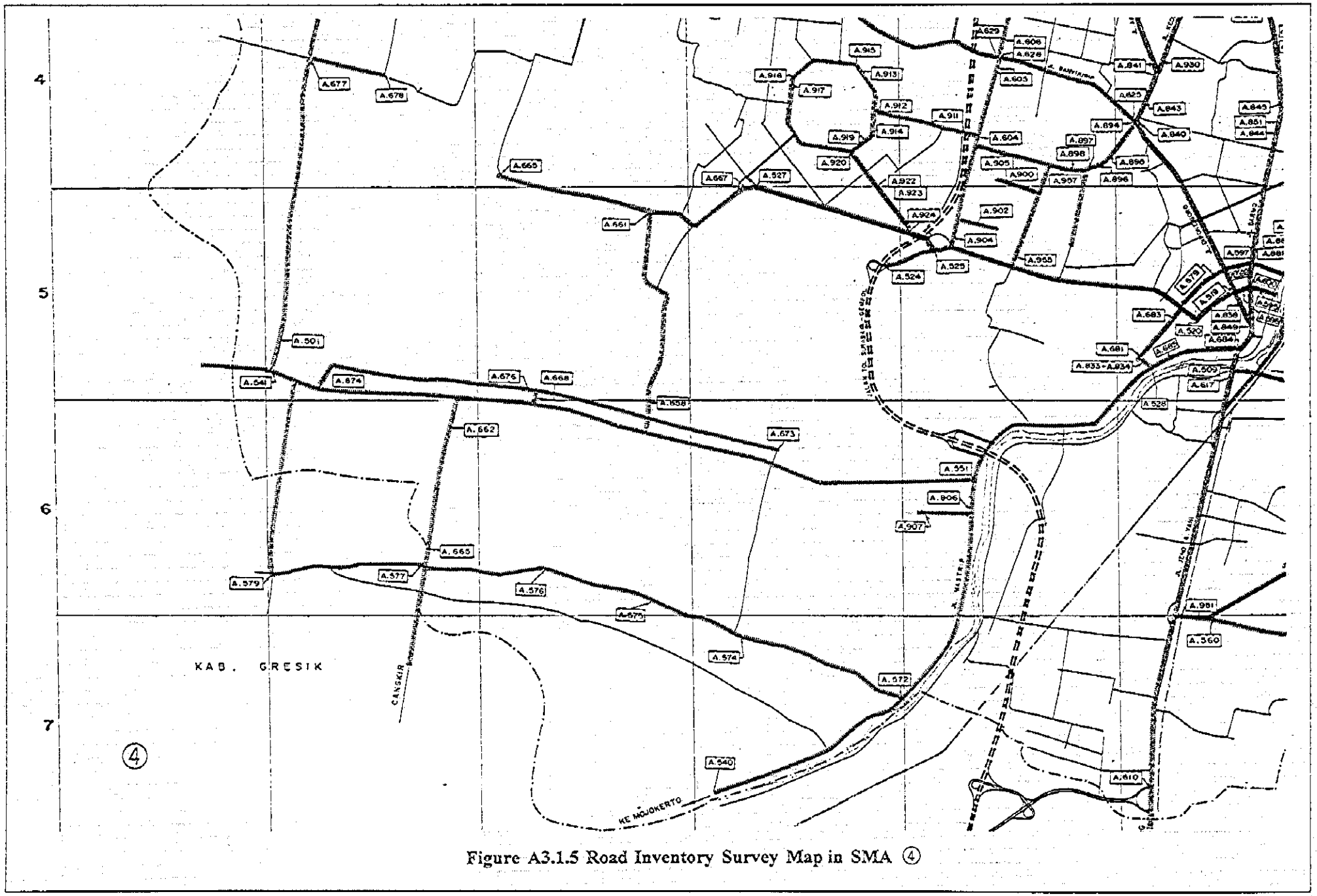
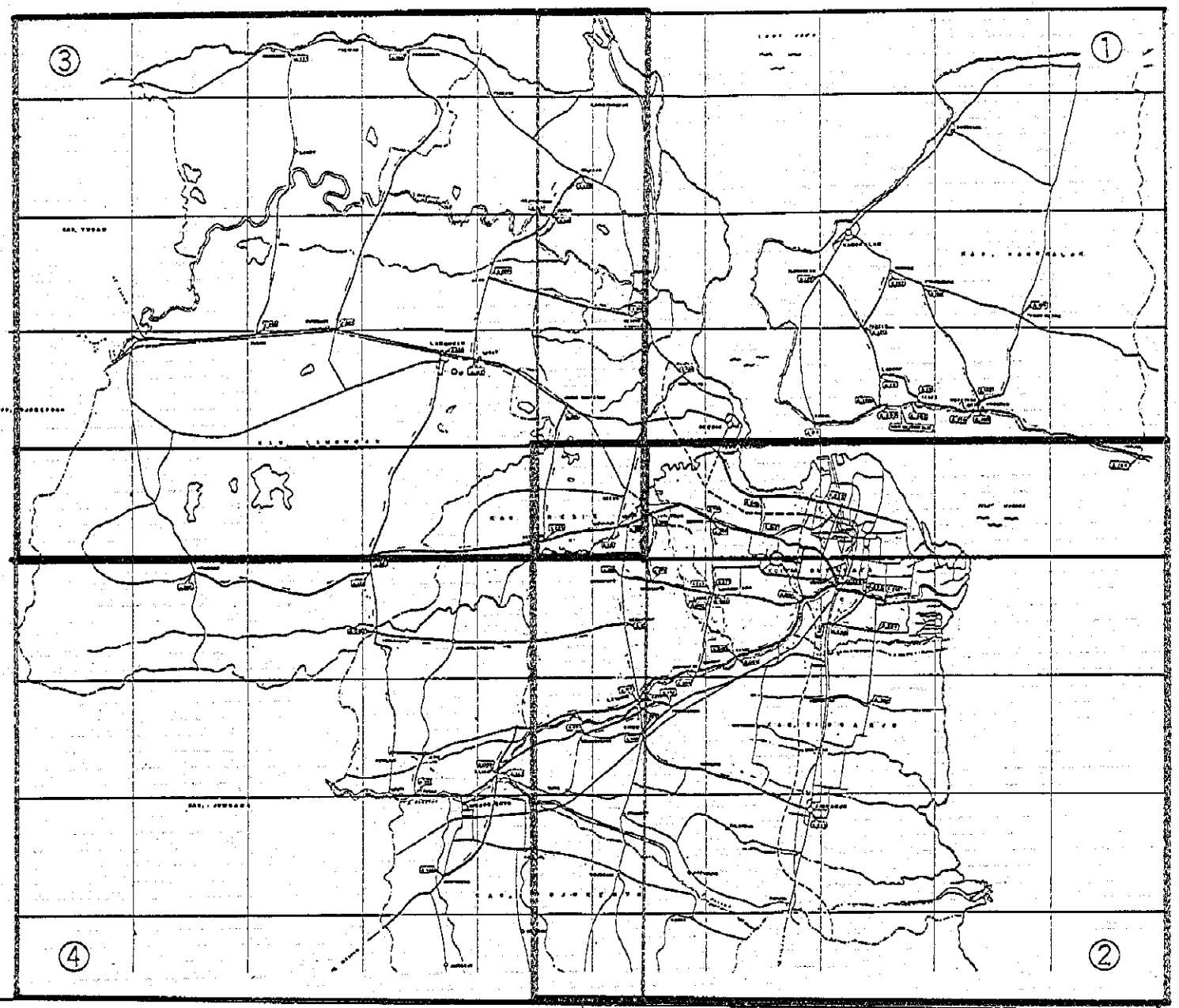


Figure A3.1.5 Road Inventory Survey Map in SMA ④



A STUDY FOR ARTERIAL ROAD SYSTEM DEVELOPMENT
IN GERBAN KERTOSUSILA REGION

Figure A3.1.6 Indesx Map of Road Inventory Survey in GKS

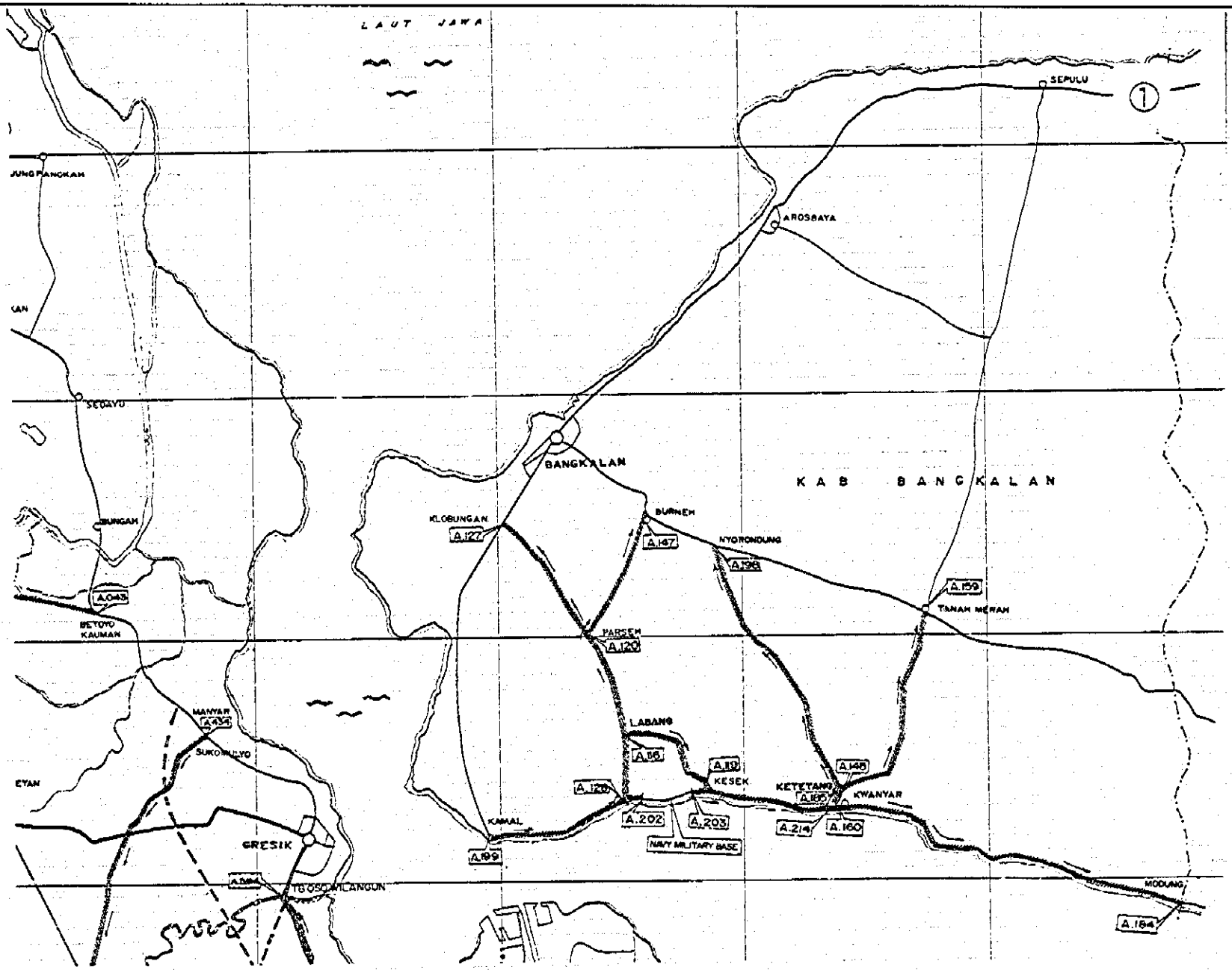


Figure A3.1.7 Road Inventory Survey Map in GKS ①

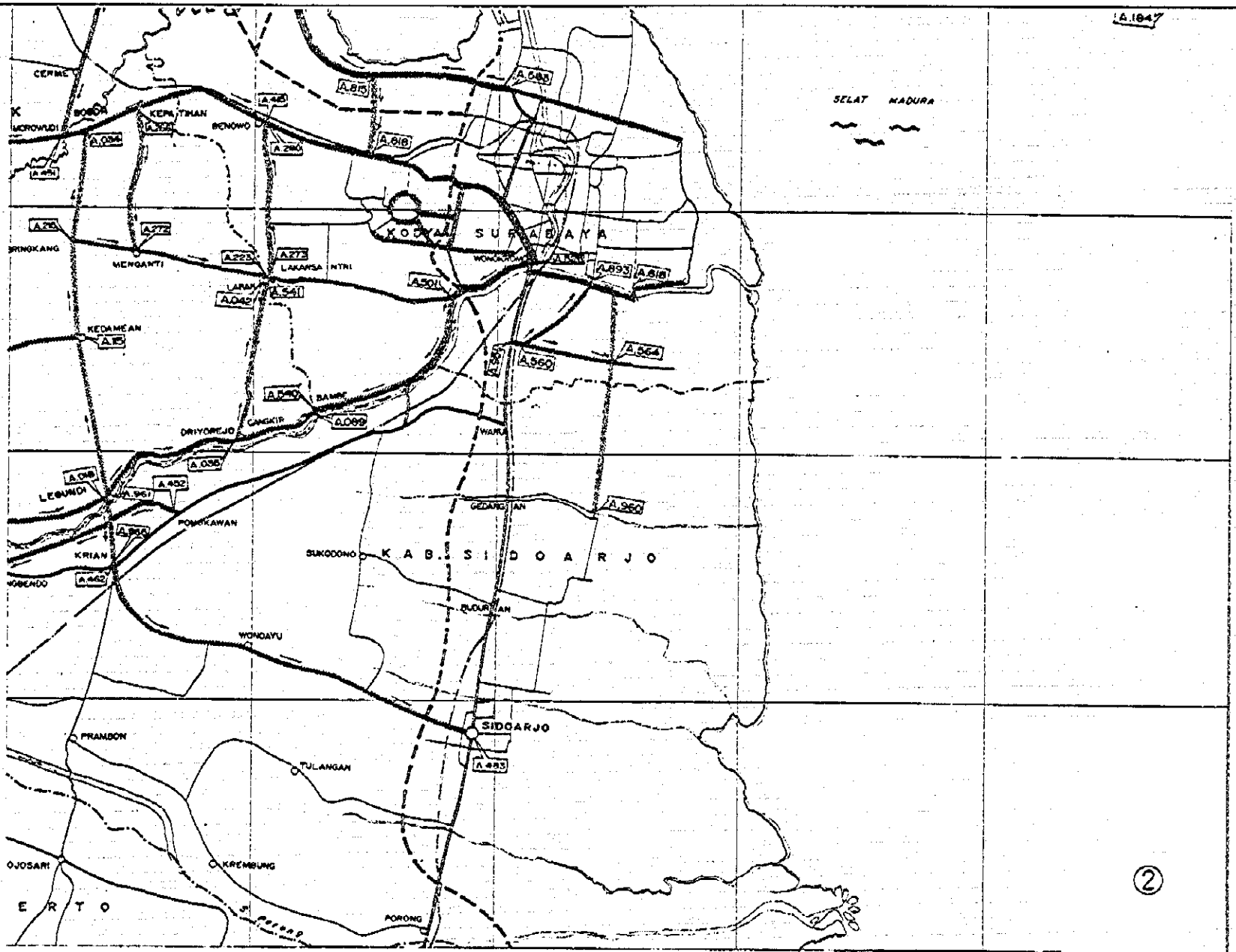


Figure A3.1.8 Road Inventory Survey Map in GKS ②

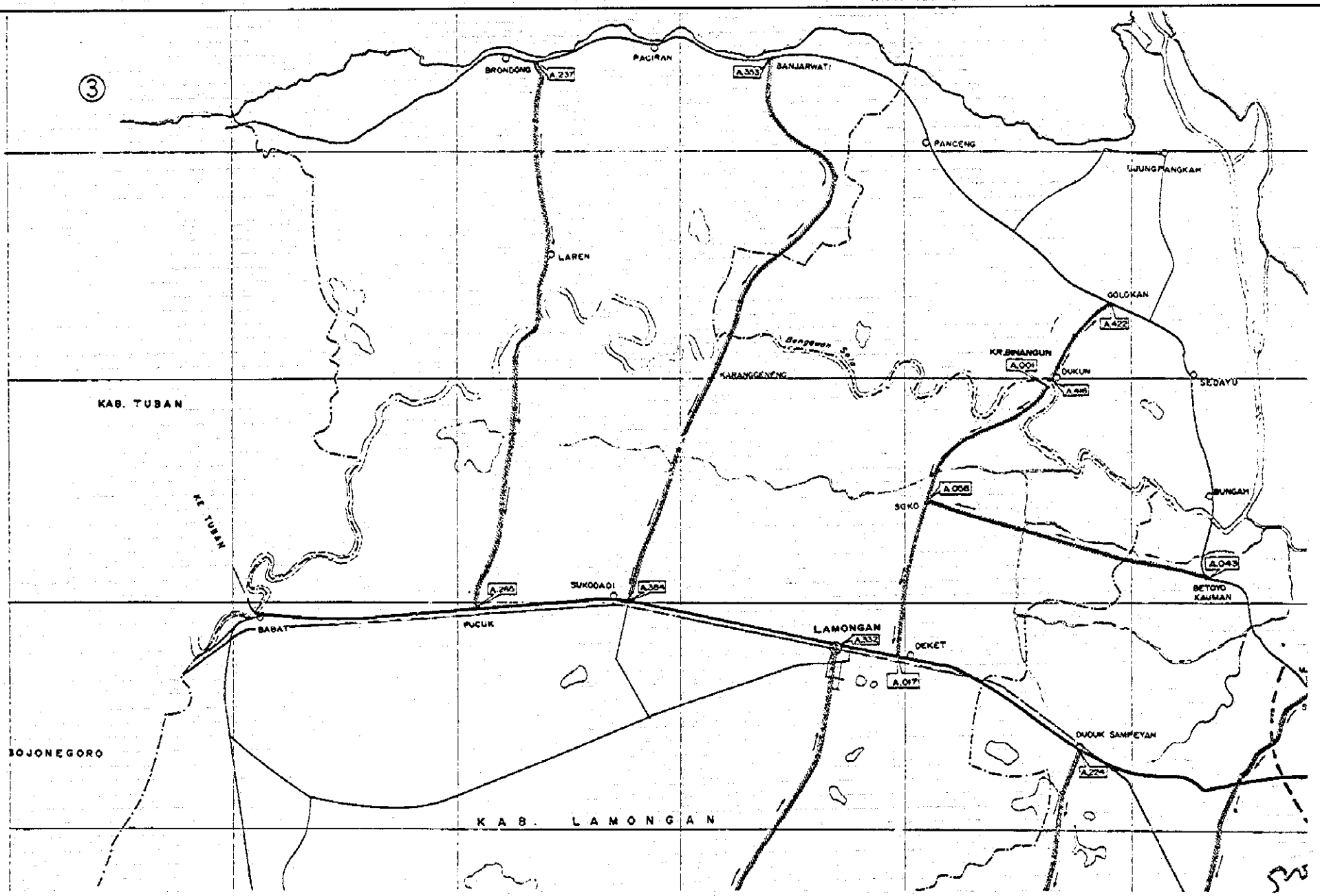


Figure A3.1.9 Road Inventory Survey Map in GKS ③

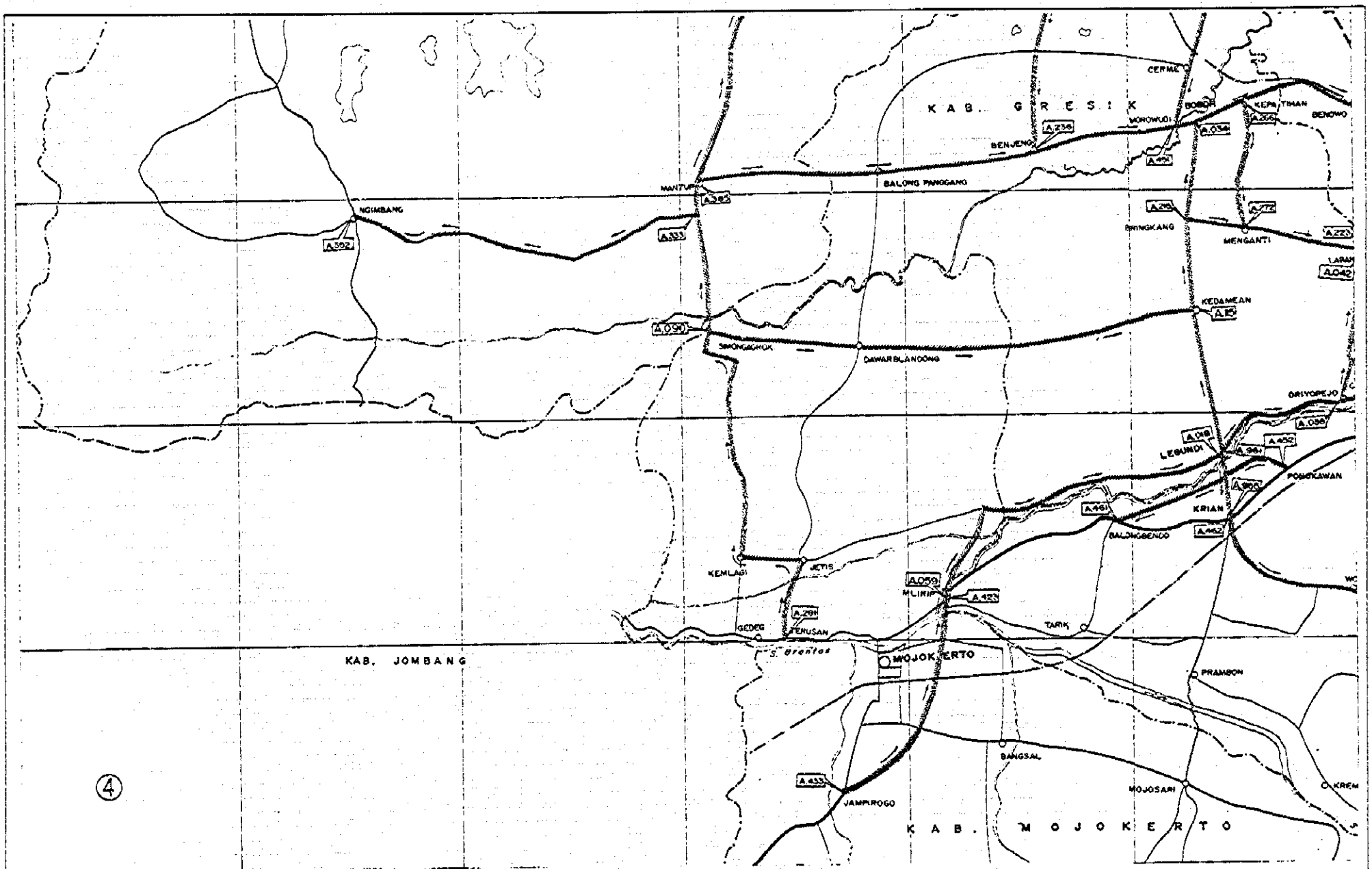


Figure A3.1.10 Road Inventory Survey Map in GKS ④

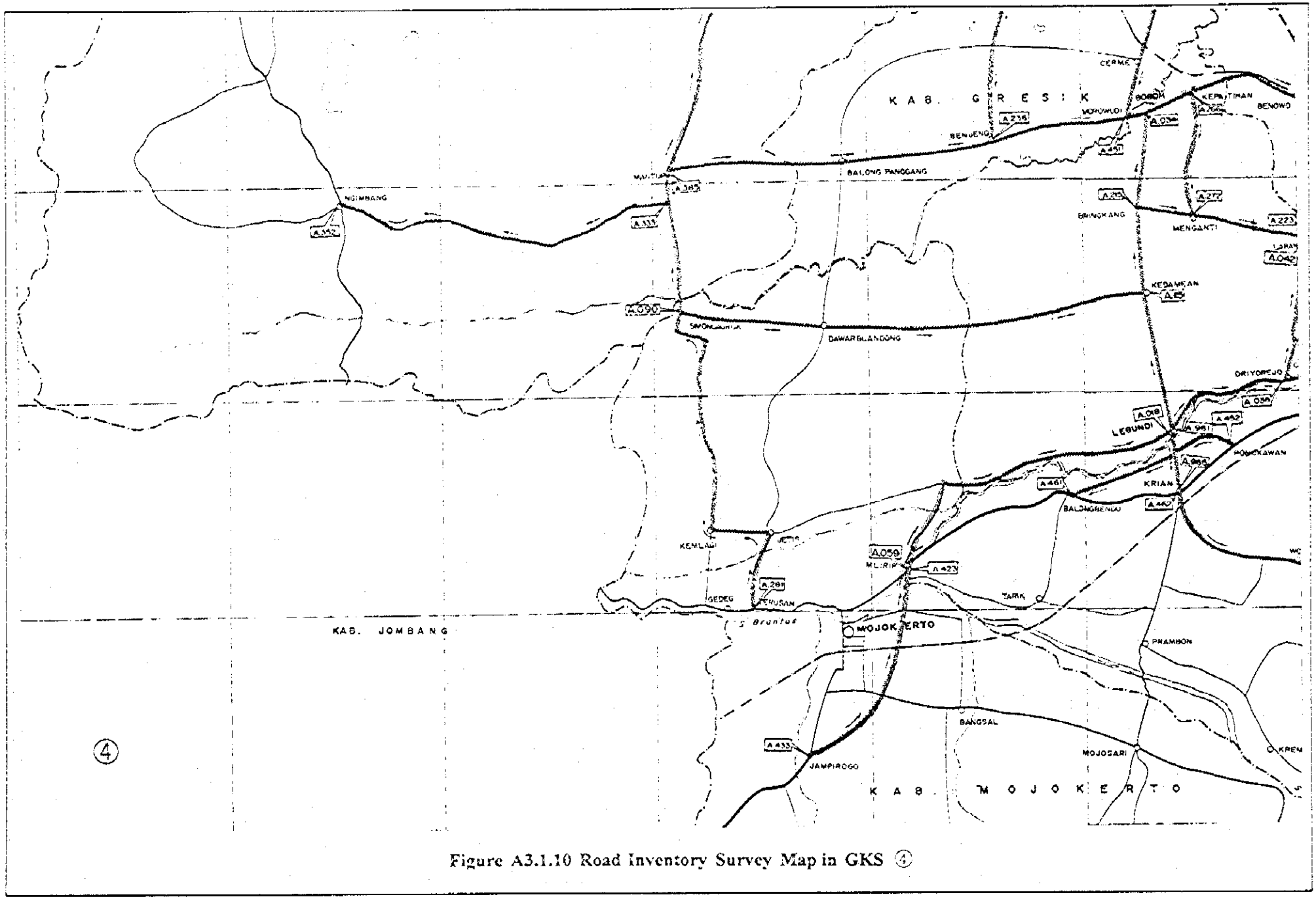


Figure A3.1.10 Road Inventory Survey Map in GKS ④

Table A3.1.1 Result of Road Inventory Survey

Code No.	From	To	Length (km)	Width (m)	IRI
009	GEMEKAN	JOMBANG	5.29	7.1	1.7
010	MOJOKERTO	GEMEKAN	10.75	7.0	1.7
011	MOJOKERTO	MURIP	3.47	7.7	2.3
012	MURIP	KRIAN	14.59	9.8	2.0
013	KERIAN	TAMAN	23.78	12.1	2.3
014	WARU	TAMAN	4.57	11.1	2.0
015	JUANDA	WARU	6.58	17.8	2.2
016	WARU	SIDOARJO	11.35	14.2	1.8
041	GRESIK	TUBANG	64.44	5.6	2.6
042	GRESIK	LAMONGAN	28.45	7.2	1.8
043	SURABAYA	GRESIK	14.93	11.7	2.5
044	LAMONGAN	BABAT	30.37	6.9	1.9
045	LAMONGAN	GEDEK	42.05	4.5	13.6
046	BABAT	PLOSO	31.04	5.3	3.2
049	GEDEK	KUDU	7.66	4.3	2.1
050	MOJOKERTO	GEDEK	4.22	5.7	1.7
051	MOJOKERTO	MOJOSARI	17.18	9.0	1.7
052	KERIAN	MOJOSARI	12.73	7.2	2.1
053	MOJOSARI	P. ARUM	13.09	5.7	1.9
054	GEMEKAN	P. ARUM	20.54	4.4	2.0
055	P.ARUM	CLAKET	8.10	3.1	4.8
056	P. ARUM	PACET	4.22	4.4	1.8
057	LEGUNDI	MURIP	18.10	7.8	1.9
058	DRIYOREJO	LEGUNDI	6.01	7.0	2.7
059	WONOKROMO	DRIYOREJO	25.04	5.8	2.9
060	LEGUNDI	KRIAN	2.93	6.1	2.5
061	SEPANJANG	TAMAN	1.85	2.6	2.0
081	MOJOSARI	GEMPOL	13.96	5.9	2.4
142	KAMAL	BANGKALAN	15.94	6.0	1.9
143	BANGKALAN	TORJUN	43.04	6.1	1.9
149	BANGKALAN	KETAPANG	47.09	4.8	3.7
162	MURIP	JAMPIROGO	10.26	9.0	2.0
200	JI.Diponegoro	JI.Darmo	10.94	11.4	2.1
201	JI. Wonokromo	JI. Pemuda	6.22	10.9	1.8
202	JI.KENCANA	JI.KEBANGSA	8.38	10.7	2.2
203	JI. RAJAWALI	JI.KENJERAN	7.33	10.9	2.5
204	JI. I. PERAK	JI. SIDORAM	8.42	11.3	1.8
205	JI.R.RUNGKUT	JI.ANDAYANI	7.87	12.7	2.1
A001	Kenjeran Baru Jl.	Deket	18.00	3.9	6.5
A018	Legundi	Boboh	18.00	6.0	5.9
A035	Cangkir	Lakarsantri	7.00	4.1	12.5
A.043	Betoyo	Soko	14.70	3.6	6.5
A.090	Simongarang	Kecamatan	25.00	5.5	10.8
A.116	Labang	Kesek	2.50	5.7	12.2
A.120	Kamal	Kebugeran	8.85	5.1	7.9
A.128	Kamal	Burneh	18.20	4.8	5.4
A.148	Kuanyar	Tanamerah	10.85	5.3	9.4
A.160	Kuanyar	Modung	23.90	4.5	9.1
A.185	Kesek	Nyorondeng	12.35	4.8	7.2
A.199	Batporon	Kuanyar	10.15	4.8	9.2
A215	Bunder	Labul	8.00	4.7	6.2
A224	Dukusampean	Benjeng	13.00	4.4	5.9
A231	Brondong	Duwak	29.20	4.5	6.8
A266	Kepatihan	Menganti	6.00	4.0	24.6
A273	Lakarsantri	Benowo	7.00	5.1	13.4
A333	Manyar	Nambang	19.00	4.8	7.1
A353	Banjarwati	Sukodadi	30.20	5.3	4.6
A385	Manyar	Benowo	30.00	4.5	8.3
A416	Dukun	Glotkan	5.60	3.5	3.0
A424	Sukomulyo	Morowudi	16.00	5.5	7.7
A452	Krian Bypass		8.15	10.4	4.8
A462	Krian	Sidoarjo	20.65	8.9	4.7
A484	K.Bokor Sel. Gedung Wanita		0.80	6.4	4.3
A486	Kali Bokor Selatan		0.60	5.9	4.9
A488	Kali Bokor	Keputih	7.95	5.6	6.7
A497	Jeksokah	Semampir	3.00	4.0	7.0
A501	Lakarsantri	Mada Kidul	4.00	6.0	9.5
A508	Alas Malang		1.90	4.5	5.4
A509	Jagir	K. Baruk	8.50	8.5	4.8
A519	Ciliwung	Adityawarman	3.30	10.8	6.2
A520	Mayjen. Sungkono		3.30	18.6	4.6
A525	HR. Muhamad		2.20	10.3	5.1
A541	Lakarsantri	Wiyung	9.45	6.2	5.8
A552	Tanjungsari		2.25	9.8	6.5
A558	Simorejo II		1.00	14.4	12.0
A568	Asemrowo		0.95	6.0	5.6
A564	Rungkut Madya	Wonorejo	6.40	4.3	15.3
A572	Kendangan II	Bacangan	6.40	4.4	6.7
A580	Gresik		2.60	11.0	3.5
A584	Kalianak		2.90	9.3	2.8
A597	Tambakoso	Jl. Wilangun	6.30	8.2	4.8
A601	Nginden Jaya	Cuding Asri	1.75	10.8	3.2
A604	Simogunung		0.90	4.0	4.0
A608	Soromulyo		0.75	4.8	1.7
A621	Raya Rungkut	Raya Wadung Asri	2.10	6.7	4.0
A625	Bambu Urip		2.40	7.5	2.3
A629	Raya Tandes		14.00	7.2	3.5
A644	Darmo		2.60	10.1	5.3
A648	Dupak		2.00	10.3	4.0
A651	Tidar		2.10	8.0	7.1
A654	Kedung Benowo		2.40	4.5	5.7
A658	Ujah Kulon	Lontar	2.60	5.9	7.8
A662	Lidah Kulon	Lontar	2.13	6.6	5.9
A665	Raya Pradah		0.60	4.3	2.8
A668	Jeruk	Dukuh Karangan	4.90	2.5	-
A674	Barat Melayu		1.30	2.5	6.9
A677	Made Wetan		1.00	3.6	6.6
A679	Kutisari		0.65	10.1	3.7
A681	Hayamwuruk		1.65	7.2	3.5
A684	Joyoboyo		0.93	10.3	3.2
A686	Bung Tomo		2.15	17.8	3.6
A690	Manyar	Nginden	1.55	13.5	3.6
A693	Menur		2.63	7.8	6.3
A697	Wonorejo		2.40	4.2	3.4
A699	Kewajan Putih		1.25	3.8	3.7
A705	Ti Pandak		4.60	23.5	3.5
A715	Sising Mangaraja		0.80	10.4	-
A716	Bulak Sari		0.90	3.0	3.7

Source: JICA Study Team

Table A3.1.1 Result of Road Inventory Survey

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009	GEMEKAN	JOMBANG	5.29	7.1	1.7
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012	MLIRIP	KRIAN	14.59	9.8	2.0
013	KERIAN	TAMAN	13.75	12.3	2.3
014	WARU	TAMAN	4.57	11.1	2.0
015	JLAYANI	WARU	5.58	17.9	2.2
016	WARU	SIDOARJO	11.35	14.2	1.8
041	GRESIK	TUBANG	86.44	5.6	2.5
042	GRESIK	LAMONGAN	28.45	7.2	1.8
043	SURAABAYA	GRESIK	14.95	11.7	2.5
044	LAMONGAN	BABAT	30.37	6.9	1.9
045	LAMONGAN	GEDEK	42.04	4.5	3.6
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049	GEDEK	KUDU	7.66	4.8	2.1
050	MOJOKERTO	GEDEK	4.22	5.7	1.7
051	MOJOKERTO	MOJOSARI	17.18	9.0	1.7
052	KERIAN	MOJOSARI	12.73	7.2	2.1
053	MOJOSARI	P. ARUM	13.08	6.7	1.9
054	GEMEKAN	P. ARUM	20.54	4.4	2.0
055	P. ARUM	CLAKET	8.10	3.1	14.8
056	P. ARUM	PACET	4.22	4.4	1.8
057	LEGUNDI	MLIRIP	18.10	4.6	1.9
058	DRIYOREJO	LEGUNDI	6.01	7.0	2.7
059	WONOKROMO	DRIYOREJO	25.04	5.6	2.8
060	LEGUNDI	KRIAN	2.93	6.1	2.5
061	SEPANJANG	TAMAN	1.86	7.6	2.0
081	MOJOSARI	GEMPOL	13.96	5.9	2.4
142	KAMAL	BANGKALAN	15.94	6.0	1.9
143	BANGKALAN	TORJUN	43.04	6.1	1.9
148	BANGKALAN	KETAPANG	47.05	4.8	3.7
162	MLIRIP	JAMPIROGO	10.26	9.0	2.0
200	Jl.Diponegoro	Jl.Demak	10.94	11.4	2.4
201	Jl. Wonokromo	Jl. Pemuda	6.22	10.9	1.8
202	Jl. KENCANA	Jl.KBANGSA	8.38	10.7	2.2
203	Jl. RAJAWALI	Jl.KENJERAN	7.33	10.9	2.5
204	Jl. T. PERAK	Jl. SIDORAM	8.42	11.3	1.8
205	Jl.R.RUNGKUT	Jl.ANDAYANI	7.87	12.7	2.1
A001	Karangbinangun	Deket	16.00	3.9	6.5
A018	Legundi	Boboh	16.00	6.0	5.9
A035	Gangkir	Lakarsantri	7.00	4.1	12.5
A043	Betoyo	Soko	14.70	3.6	6.5
A090	Simongagrok	Kedamean	25.00	3.5	10.6
A116	Labang	Kesek	2.50	5.7	12.2
A120	Parseh	Klobungan	6.85	5.1	7.9
A128	Kamal	Burneh	18.20	4.8	5.4
A148	Kuanyar	Tanamerah	10.45	5.3	9.4
A160	Kuanyar	Modung	23.90	4.5	9.1
A185	Ketetang	Nyorondong	12.35	4.6	7.2
A199	Batporon	Kuanyar	10.15	4.8	9.2
A215	Bringkang	Laban	8.00	4.7	8.2
A224	Dukusampean	Benjeng	13.00	4.4	5.9
A237	Brondong	Puguk	28.20	4.5	6.8
A266	Kepatihan	Menganti	6.00	4.0	24.6
A273	Lakarsantri	Benowo	7.00	5.1	13.4
A333	Mantup	Ngimbang	19.00	4.8	7.1
A353	Banjarwati	Sukodadi	30.20	5.3	4.6
A365	Mantup	Benowo	30.00	4.5	6.3
A416	Dukun	Glolkan	5.60	3.5	3.0
A434	Sukomulyo	Morowudi	18.00	5.5	7.7
A452	Krian Bypass		8.15	10.4	4.8
A462	Krian	Sidoarjo	20.65	6.9	4.7
A484	KBokor Sel. Gedung Wanita		0.80	6.4	4.3
A486	Kali Bokor Selatan		0.60	5.9	4.9
A488	Kali Bokor	Keputih	7.95	5.6	6.7
A497	Medokan	Semampir	3.00	4.0	7.0
A501	Lakarsantri	Mada Kidul	4.00	6.0	9.5
A506	Alas Malang		1.90	4.5	5.4
A509	Jagir	K. Baruk	8.50	8.5	4.8
A519	Ciliwung	Adityawarman	3.30	10.8	6.2
A520	Mayjen. Sungkono		3.30	18.6	4.6
A525	HR. Muhamad		2.20	10.3	5.7
A541	Lakarsantri	Wiyung	9.45	6.2	5.8
A552	Tanjungsari		2.25	9.8	6.5
A556	Simorejo II		1.00	14.4	12.0
A558	Asemorowo		0.95	4.0	5.6
A564	Rungkut Madya	Wonorejo	6.40	4.3	15.3
A572	Kebraon II	Bankingan	6.40	4.4	6.7
A580	Gresik		2.60	11.0	3.5
A584	Kalianak		2.90	9.3	2.8
A587	Tambakoso	Jl. Wilangun	6.30	8.2	4.8
A601	Ngagel Jaya	Pucang Anom	1.75	10.8	3.2
A604	Simogunung		0.90	4.0	4.0
A606	Somomulyo		0.75	4.8	7.7
A621	Raya Rungkut	Raya Wadung Asri	2.10	6.7	4.0
A625	Banyu Urip		2.40	7.5	2.3
A629	Raya Tandes		14.00	7.2	3.5
A644	Damak		2.60	10.1	5.3
A648	Dupak		2.00	10.3	4.0
A651	Tidar		2.10	6.0	7.1
A654	Kedung Benowo		2.40	4.5	5.7
A658	Lidah Kulon	Lontar	2.80	5.5	7.8
A662	Lidah Kulon	Lontar	2.13	6.6	5.9
A666	Raya Pradah		0.60	4.3	2.8
A668	Jeruk	Dukuh Karangan	4.90	2.5	-
A674	Banjal Melati		1.30	2.5	8.9
A677	Made Wetan		1.00	3.6	6.6
A679	Kutai		0.65	10.1	3.7
A681	Hayamwruk		1.65	7.2	3.5
A684	Joyoboyo		0.93	10.3	3.2
A686	Bung Tomo		2.15	17.8	3.6
A690	Manyar	Nginden	1.55	13.5	3.6
A693	Menur		2.63	7.8	6.3
A697	Wonocarum		2.40	4.2	3.4
A699	Kenjaran Putih		1.25	3.8	3.7
A705	T. Perak		4.60	23.5	3.5
A715	Sising Mangaraja		0.80	10.4	-
A716	Bulak Sari		0.90	3.0	3.7

Source: JICA Study Team

Tabel A3.1.1 Result of Road Inventory Survey (Continued)

Code No.	From	To	Length (km)	Width (m)	IRI
A718	Ruawali		1.00	12.9	3.5
A721	Danakarya		0.70	14.0	3.0
A723	Bulak Banteng		0.50	3.0	2.9
A724	Indrapura		1.35	18.3	3.1
A726	Kandang Jenuh		0.75	18.7	3.2
A727	Kaliwaron		1.30	6.3	3.3
A730	Kapasan		0.95	17.3	4.9
A731	Mulyorejo		1.30	7.0	4.9
A733	Tenggumung Wetan		1.30	3.3	3.8
A735	Sutorejo		1.00	7.0	3.7
A736	Tambangboyo		0.60	7.3	-
A737	Karang Tembok		0.95	3.0	10.3
A739	Tempur Rejo		0.90	6.7	-
A740	Sukolilo		1.80	4.5	-
A743	Nambangan		1.30	8.5	3.3
A745	Kedung Cowek		2.90	6.5	3.9
A749	Tambak Wedi		1.00	3.5	3.2
A753	Dukuh Bulakbanteng		1.85	3.3	-
A755	Usman		0.85	13.0	-
A757	Nambangan Perak		0.80	3.5	-
A760	Tenggumung		1.00	4.4	-
A761	Karang Asem IV		1.50	3.5	-
A763	Randu		1.30	4.0	-
A765	Mulyorejo Barat		0.85	2.8	12.7
A766	Raya Sedati		1.20	10.0	7.4
A767	Kedinding Lor		1.00	4.5	-
A768	Wonosari Lor		1.10	6.0	6.1
A770	Kali Kedinding		1.30	3.0	-
A772	Tanah Merah I		1.25	4.0	-
A774	Tambak Deres		2.15	3.9	-
A777	Kejawan Gebang		0.90	4.5	4.3
A778	Pogot		0.80	4.5	5.9
A779	Dharmahusada		0.45	7.4	5.8
A780	Kertajaya		1.40	10.0	7.0
A782	Manyar Kertoarjo		1.20	9.0	6.8
A784	Kertajaya Indah		2.00	9.0	3.6
A787	Kedungsroko	Pacarkeling	2.60	6.4	4.8
A791	Kalibutuh		1.90	8.6	5.4
A795	Kyanggan		0.70	6.5	-
A796	Panglima Sudirman		1.10	18.0	-
A798	Yos. Sudarso		0.50	15.3	4.8
A801	Pahlawan		1.10	20.3	3.9
A803	Gembleongan		0.50	20.0	3.3
A804	Tunjungan		1.00	18.0	3.3
A805	Pemuda		1.00	17.7	3.6
A807	Kramat Gantung		0.70	12.0	-
A810	Semarang		0.90	16.0	4.1
A812	Ambengan		1.20	10.0	4.0
A814	Baratajaya XVI		0.60	8.0	6.6
A815	Margomulyo		2.55	6.8	4.9
A819	Tembokan		0.80	11.1	4.9
A823	Jagalan		0.50	11.5	3.7
A825	Ngagel		0.40	16.0	7.3
A826	Kapas Krampung		1.50	13.0	5.7

Code No.	From	To	Length (km)	Width (m)	IRI
A828	Potro Agung		0.70	8.2	3.9
A830	Waikuda Utara		1.10	11.8	3.9
A831	Gubeng Pojok		0.80	14.8	3.7
A833	Gajah Mada		0.50	8.3	5.9
A835	Kalijudan		2.85	4.0	3.4
A844	Urip Sumoharjo		0.55	11.8	3.0
A845	Basuki Rachmat		1.45	16.5	3.2
A848	Bronggalan II		0.65	9.5	3.6
A849	Raya Darmo		2.20	11.8	2.9
A852	Kebonsari		1.00	14.9	5.7
A854	Mustopo		2.10	9.7	8.1
A859	Darmahusada Indah		1.20	9.6	11.0
A861	Kalisari		0.70	6.0	3.0
A862	Mulyosari		1.10	6.0	6.3
A864	Kejawan Putih		1.20	5.0	3.1
A883	Gentengkali		0.60	10.3	3.4
A889	Darmawangsa		1.10	11.5	3.7
A892	Raya Prapen		1.25	12.5	8.9
A894	Girilaya		0.70	5.5	8.4
A896	Jarak		1.00	4.4	-
A898	Putat Jaya		0.50	4.5	8.4
A900	Dukuh Kupang XX		0.55	4.5	8.2
A904	Dukuh Kupang Barat		1.00	10.0	14.9
A908	Baratajaya		2.00	6.3	4.8
A911	Raya Kupang Jaya		1.08	9.2	9.6
A917	Raya Darmo Permai III		1.40	7.8	7.2
A920	Darmo Baru Barat		1.10	5.8	6.7
A923	Kupang Indah		0.70	4.8.3	9.8
A930	Kedungdoro		1.30	13.2	4.3
A934	Bubutan		1.65	8.0	4.1
A937	Wonokusumo		0.75	4.4	8.2
A938	Kedungsroko		1.20	4.0	11.4
A940	Platuk		0.55	4.0	10.3
A941	Tambakyo		0.70	5.5	-
A942	Kapas Jaya		1.20	2.7	3.5
A945	Sidotopo Wetan		1.20	4.0	3.5
A948	Bronggalan		0.90	2.9	4.2
A950	Karang Asem		0.55	8.0	3.4
A951	Jemursari		3.00	10.8	4.7
A955	Raya Dukuh Kupang		1.70	0.5	7.8
A958	Sedati		2.30	7.0	11.2

Source: JICA Study Team

Tabel A3.1.1 Result of Road Inventory Survey (Continued)

Code No.	From	To	Length (km)	Width (m)	IRI
A718	Rajawali		1.00	12.9	3.5
A721	Danakarya		0.70	14.0	3.0
A723	Bulak Banteng		0.50	3.0	2.9
A724	Indrapura		1.35	18.3	3.1
A728	Kerbang Jepun		0.75	18.7	3.2
A727	Kaliwaron		1.30	6.3	3.3
A730	Kapasan		0.95	17.3	4.9
A731	Mulyorejo		1.30	7.0	4.9
A733	Tenggumung Wetan		1.30	3.3	3.8
A735	Sutorejo		1.00	7.0	3.7
A738	Tambangboyo		0.60	7.3	-
A737	Karang Tembok		0.95	3.0	10.3
A739	Tempur Rejo		0.90	8.7	-
A740	Sukolilo		1.80	4.5	-
A743	Nambangan		1.30	4.5	3.3
A745	Kedung Cowek		2.90	6.5	3.9
A749	Tambak Wedi		1.00	3.5	3.2
A753	Dukuh Bulakbanteng		1.85	3.3	-
A755	Usman		0.85	13.0	-
A 757	Nambangan Perak		0.80	3.5	-
A.760	Tenggumung		1.00	4.4	-
A 761	Karang Asem IV		1.50	3.5	-
A.763	Randu		1.00	4.0	-
A 765	Mulyorejo Barat		0.85	2.8	12.7
A.766	Raya Sedati		1.20	10.0	7.4
A 767	Kedinding Lor		1.00	4.5	-
A.768	Wonosari Lor		1.10	5.0	8.7
A 770	Kali Kedinding		1.30	3.0	-
A.772	Tanah Merah		1.25	4.0	-
A 774	Tambak Oeres		2.15	3.9	-
A.777	Kejawan Gebang		0.90	4.5	4.3
A 778	Pogot		0.80	4.5	5.9
A.779	Darmahusada		0.45	7.3	5.9
A 780	Kertajaya		1.40	10.0	7.0
A.782	Manyar Kertoarjo		1.20	9.0	6.8
A 784	Kertajaya Indah		2.00	9.0	3.6
A.787	Kedungsroko	Pacarkeling	2.60	8.4	4.8
A 791	Kalibutuh		1.90	8.6	5.4
A.795	Kranggan		0.70	6.5	-
A 796	Panglima Sudirman		1.10	18.0	-
A.798	Yos. Sudarso		0.50	15.3	4.8
A 801	Pahlawan		1.10	20.3	3.9
A.803	Gemblongan		0.50	20.0	3.3
A 804	Tunjungan		1.00	18.0	3.3
A.805	Pemuda		1.00	17.7	3.8
A 807	Kramat Gantung		0.70	12.0	-
A.810	Semarang		0.90	16.0	4.4
A 812	Ambengan		1.20	10.0	4.0
A.814	Baratajaya XVI		0.65	6.0	6.5
A 815	Margomulyo		2.55	6.8	4.9
A.819	Tembakan		0.80	11.1	4.9
A 823	Jagalan		0.50	11.5	3.7
A.825	Ngaglik		0.60	16.0	7.3
A 826	Kapas Krampung		1.50	13.0	5.7
A 828	Potro Agung		0.70	8.2	3.9
A.830	Walikota ustajab		1.10	11.5	3.9
A 831	Gubeng Pojok		0.80	14.8	3.7
A.833	Gajah Mada		0.50	8.3	5.9
A 835	Kalijudan		2.85	4.0	3.4
A.844	Urip Sumoharjo		0.55	11.8	3.0
A 845	Basuki Rachmat		1.45	16.5	3.2
A.848	Bronggalan II		0.55	3.5	3.8
A 849	Raya Darmo		2.20	11.8	2.9
A.852	Kebonrojo		0.50	14.9	5.7
A 854	Mustopo		2.10	9.7	8.1
A.859	Darmahusada Indah		1.30	8.6	31.0
A 861	Kalisari		0.70	6.0	3.0
A.862	Mulyosari		1.10	6.0	5.3
A 864	Kejawan Putih		1.20	5.0	3.1
A.883	Gentengkali		0.80	10.3	3.4
A 889	Darmawangsa		1.10	11.5	3.7
A.892	Raya Prapen		1.25	12.5	8.9
A 894	Ginfaya		0.70	5.5	8.4
A.895	Jarak		1.00	4.4	-
A 898	Putat Jaya		0.50	4.5	8.4
A.900	Dukuh Kupang XX		0.55	4.5	8.2
A 904	Dukuh Kupang Barat		1.00	10.0	14.9
A.908	Baratajaya		2.00	16.3	4.8
A 911	Raya Kupang Jaya		1.08	9.2	9.6
A.917	Raya Darmo Permai III		1.50	7.6	7.2
A 920	Darmo Baru Barat		1.10	5.8	6.7
A.923	Kupang Indah		0.70	8.3	6.6
A 930	Kedungdoro		1.30	13.2	4.3
A.934	Bubutan		1.65	8.0	4.1
A 937	Wonokusumo		0.75	4.4	8.2
A.938	Kedungmangu		1.20	4.0	7.3
A 940	Platuk		0.55	4.0	10.3
A.941	Tambakrejo		0.70	5.5	-
A 942	Kapas Jaya		1.20	2.7	3.5
A.948	Sidotopo Wetan		1.20	4.0	3.5
A 948	Bronggalan		0.90	2.9	4.2
A.950	Karang Asem		0.55	8.0	-
A 951	Jemursari		3.00	10.8	4.7
A.955	Raya Dukuh Kupang		1.70	6.5	7.8
A 958	Sedati		2.30	7.0	11.2

Source: JICA Study Team

Appendix 4.1 Zone System

Table A4.1.1 Zone Code List

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
78	Kod.Surabaya	010	Lakarsantri	01	Bangkingan	SMA	1
78	Kod.Surabaya	010	Lakarsantri	02	Sumur Welut	SMA	2
78	Kod.Surabaya	010	Lakarsantri	03	Lidah Wetan	SMA	3
78	Kod.Surabaya	010	Lakarsantri	04	Lidah Kulon	SMA	4
78	Kod.Surabaya	010	Lakarsantri	05	Jeruk	SMA	5
78	Kod.Surabaya	010	Lakarsantri	06	Lakarsantri	SMA	6
78	Kod.Surabaya	010	Lakarsantri	07	Made	SMA	7
78	Kod.Surabaya	010	Lakarsantri	08	Beringin	SMA	8
78	Kod.Surabaya	010	Lakarsantri	09	Sambi Kerep	SMA	9
78	Kod.Surabaya	010	Lakarsantri	10	Lontar	SMA	10
78	Kod.Surabaya	020	Karang Pilang	01	Warugunung	SMA	11
78	Kod.Surabaya	020	Karang Pilang	02	Karang Pilang	SMA	12
78	Kod.Surabaya	020	Karang Pilang	04	Kebraon	SMA	13
78	Kod.Surabaya	020	Karang Pilang	05	Kedurus	SMA	14
78	Kod.Surabaya	021	Wiyung	01	Balas Klumprik	SMA	15
78	Kod.Surabaya	021	Wiyung	02	Babadan	SMA	16
78	Kod.Surabaya	021	Wiyung	03	Wiyung	SMA	17
78	Kod.Surabaya	021	Wiyung	04	Jajar Tunggal	SMA	18
78	Kod.Surabaya	022	Dukuh Pakis	01	Gunung Sari	SMA	19
78	Kod.Surabaya	022	Dukuh Pakis	02	Dukuh Pakis	SMA	20
78	Kod.Surabaya	022	Dukuh Pakis	03	Pradah Kalikendal	SMA	21
78	Kod.Surabaya	022	Dukuh Pakis	04	Dukuh Kupang	SMA	22
78	Kod.Surabaya	030	Wonocolo	04	Siwalankerto	SMA	23
78	Kod.Surabaya	030	Wonocolo	10	Jemur Wonosari	SMA	24
78	Kod.Surabaya	030	Wonocolo	11	Margorejo	SMA	25
78	Kod.Surabaya	030	Wonocolo	12	Bendul Merisi	SMA	26
78	Kod.Surabaya	030	Wonocolo	13	Sidosermo	SMA	27
78	Kod.Surabaya	031	Jambangan	01	Pagesangan	SMA	28
78	Kod.Surabaya	031	Jambangan	02	Kebonsari	SMA	29
78	Kod.Surabaya	031	Jambangan	03	Jambangan	SMA	30
78	Kod.Surabaya	031	Jambangan	04	Karah	SMA	31
78	Kod.Surabaya	032	Gayungan	01	Dukuh Menanggal	SMA	32
78	Kod.Surabaya	032	Gayungan	02	Menanggal	SMA	33
78	Kod.Surabaya	032	Gayungan	03	Gayungan	SMA	34
78	Kod.Surabaya	032	Gayungan	04	Ketintang	SMA	35
78	Kod.Surabaya	040	Rungkut	06	Medokan Ayu	SMA	36
78	Kod.Surabaya	040	Rungkut	07	Rungkut Kidul	SMA	37
78	Kod.Surabaya	040	Rungkut	12	Kali Rungkut	SMA	38
78	Kod.Surabaya	040	Rungkut	13	Kedung Baruk	SMA	39
78	Kod.Surabaya	040	Rungkut	14	Penjaringan Sari	SMA	40
78	Kod.Surabaya	040	Rungkut	15	Wonorejo	SMA	41
78	Kod.Surabaya	041	Tenggilis Mejoyo	01	Kutisari	SMA	42
78	Kod.Surabaya	041	Tenggilis Mejoyo	02	Kendangsari	SMA	43
78	Kod.Surabaya	041	Tenggilis Mejoyo	03	Tenggilis Mejoyo	SMA	44
78	Kod.Surabaya	041	Tenggilis Mejoyo	04	Prapen	SMA	45
78	Kod.Surabaya	041	Tenggilis Mejoyo	05	Panjang Jiwo	SMA	46
78	Kod.Surabaya	042	Gunung Anyar	02	Rungkut Menanggal	SMA	47
78	Kod.Surabaya	042	Gunung Anyar	03	Rungkut Tengah	SMA	48
78	Kod.Surabaya	042	Gunung Anyar	04	Gunung Anyar	SMA	49
78	Kod.Surabaya	042	Gunung Anyar	05	Gunung Anyar Tambak	SMA	50
78	Kod.Surabaya	050	Sukolilo	01	Nginden Jangkungan	SMA	51
78	Kod.Surabaya	050	Sukolilo	02	Semolowaru	SMA	52
78	Kod.Surabaya	050	Sukolilo	03	Medokan Semampir	SMA	53
78	Kod.Surabaya	050	Sukolilo	04	Keputih	SMA	54
78	Kod.Surabaya	050	Sukolilo	05	Klampis Ngasem	SMA	55
78	Kod.Surabaya	050	Sukolilo	06	Menur Pumpungan	SMA	56

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
78	Kod.Surabaya	050	Sukolilo	08	Gebang Putih	SMA	57
78	Kod.Surabaya	051	Mulyorejo	01	Manyar Sabrangan	SMA	58
78	Kod.Surabaya	051	Mulyorejo	02	Mulyorejo	SMA	59
78	Kod.Surabaya	051	Mulyorejo	03	Kejawen Putih Tambak	SMA	60
78	Kod.Surabaya	051	Mulyorejo	04	Kalisari	SMA	61
78	Kod.Surabaya	051	Mulyorejo	05	Dukuh Sutorejo	SMA	62
78	Kod.Surabaya	051	Mulyorejo	06	Kalijudan	SMA	63
78	Kod.Surabaya	060	Gubeng	01	Baratajaya	SMA	64
78	Kod.Surabaya	060	Gubeng	02	Pucang Sewu	SMA	65
78	Kod.Surabaya	060	Gubeng	03	Kertajaya	SMA	66
78	Kod.Surabaya	060	Gubeng	04	Gubeng	SMA	67
78	Kod.Surabaya	060	Gubeng	05	Airlangga	SMA	68
78	Kod.Surabaya	060	Gubeng	06	Mojo	SMA	69
78	Kod.Surabaya	070	Wonokromo	01	Sawung Galing	SMA	70
78	Kod.Surabaya	070	Wonokromo	02	Wonokromo	SMA	71
78	Kod.Surabaya	070	Wonokromo	03	Jagir	SMA	72
78	Kod.Surabaya	070	Wonokromo	04	Ngagel Rejo	SMA	73
78	Kod.Surabaya	070	Wonokromo	05	Ngagel	SMA	74
78	Kod.Surabaya	070	Wonokromo	06	Darmo	SMA	75
78	Kod.Surabaya	080	Tegalsari	01	Keputran	SMA	76
78	Kod.Surabaya	080	Tegalsari	02	D.R. Sutomo	SMA	77
78	Kod.Surabaya	080	Tegalsari	03	Tegalsari	SMA	78
78	Kod.Surabaya	080	Tegalsari	04	Wonorejo	SMA	79
78	Kod.Surabaya	080	Tegalsari	05	Kedungdoro	SMA	80
78	Kod.Surabaya	090	Sawahan	01	Pakis	SMA	81
78	Kod.Surabaya	090	Sawahan	02	Putat Jaya	SMA	82
78	Kod.Surabaya	090	Sawahan	03	Banyu Urip	SMA	83
78	Kod.Surabaya	090	Sawahan	04	Kupang Krajan	SMA	84
78	Kod.Surabaya	090	Sawahan	05	Petemon	SMA	85
78	Kod.Surabaya	090	Sawahan	06	Sawahan	SMA	86
78	Kod.Surabaya	100	Bubutan	01	Tembok Dukuh	SMA	87
78	Kod.Surabaya	100	Bubutan	02	Bubutan	SMA	88
78	Kod.Surabaya	100	Bubutan	03	Alun-Alun Contong	SMA	89
78	Kod.Surabaya	100	Bubutan	04	Gundih	SMA	90
78	Kod.Surabaya	100	Bubutan	05	Jepara	SMA	91
78	Kod.Surabaya	110	Genteng	01	Embong Kaliasin	SMA	92
78	Kod.Surabaya	110	Genteng	02	Ketabang	SMA	93
78	Kod.Surabaya	110	Genteng	03	Genteng	SMA	94
78	Kod.Surabaya	110	Genteng	04	Peneleh	SMA	95
78	Kod.Surabaya	110	Genteng	05	Kapasari	SMA	96
78	Kod.Surabaya	120	Tambak Sari	01	Pacar Keling	SMA	97
78	Kod.Surabaya	120	Tambak Sari	02	Pacar Kembang	SMA	98
78	Kod.Surabaya	120	Tambak Sari	03	Ploso	SMA	99
78	Kod.Surabaya	120	Tambak Sari	04	Tambak Sari	SMA	100
78	Kod.Surabaya	120	Tambak Sari	05	Rangkah	SMA	101
78	Kod.Surabaya	120	Tambak Sari	06	Gading	SMA	102
78	Kod.Surabaya	130	Simokerto	01	Kapasan	SMA	103
78	Kod.Surabaya	130	Simokerto	02	Tambak Rejo	SMA	104
78	Kod.Surabaya	130	Simokerto	03	Simokerto	SMA	105
78	Kod.Surabaya	130	Simokerto	04	Sidodadi	SMA	106
78	Kod.Surabaya	130	Simokerto	05	Simolawang	SMA	107
78	Kod.Surabaya	140	Kenjeran	01	Sukolilo	SMA	108
78	Kod.Surabaya	140	Kenjeran	02	Komplek Kenjeran	SMA	109
78	Kod.Surabaya	140	Kenjeran	03	Kenjeran	SMA	110
78	Kod.Surabaya	140	Kenjeran	04	Bulak	SMA	111
78	Kod.Surabaya	140	Kenjeran	05	Tanah Kalikedin.	SMA	112
78	Kod.Surabaya	140	Kenjeran	06	Sidotopo Wetan	SMA	113
78	Kod.Surabaya	140	Kenjeran	07	Bulak Banteng	SMA	114
78	Kod.Surabaya	140	Kenjeran	08	Tambak Wedi	SMA	115

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
78	Kod.Surabaya	140	Kenjeran	09	Kedung Cowek	SMA	116
78	Kod.Surabaya	150	Semampir	01	Ampel	SMA	117
78	Kod.Surabaya	150	Semampir	02	Sidotopo	SMA	118
78	Kod.Surabaya	150	Semampir	03	Pegirian	SMA	119
78	Kod.Surabaya	150	Semampir	04	Wonokusumo	SMA	120
78	Kod.Surabaya	150	Semampir	05	Ujung	SMA	121
78	Kod.Surabaya	160	Pabean Cantikan	01	Bongkaran	SMA	122
78	Kod.Surabaya	160	Pabean Cantikan	02	Nyamplungan	SMA	123
78	Kod.Surabaya	160	Pabean Cantikan	03	Krembangan Utara	SMA	124
78	Kod.Surabaya	160	Pabean Cantikan	04	Perak Timur	SMA	125
78	Kod.Surabaya	160	Pabean Cantikan	05	Perak Utara	SMA	126
78	Kod.Surabaya	170	Krembangan	01	Dupak	SMA	127
78	Kod.Surabaya	170	Krembangan	02	Morokrembangan	SMA	128
78	Kod.Surabaya	170	Krembangan	03	Perak Barat	SMA	129
78	Kod.Surabaya	170	Krembangan	04	Kemayoran	SMA	130
78	Kod.Surabaya	170	Krembangan	05	Krembangan Selatan	SMA	131
78	Kod.Surabaya	180	Tandes	06	Gedangasin	SMA	132
78	Kod.Surabaya	180	Tandes	07	Tandes Kidul	SMA	133
78	Kod.Surabaya	180	Tandes	08	Tandes Lor	SMA	134
78	Kod.Surabaya	180	Tandes	09	Tubanan	SMA	135
78	Kod.Surabaya	180	Tandes	10	Gadel	SMA	136
78	Kod.Surabaya	180	Tandes	11	Karangpoh	SMA	137
78	Kod.Surabaya	180	Tandes	12	Balongsari	SMA	138
78	Kod.Surabaya	180	Tandes	13	Bibis	SMA	139
78	Kod.Surabaya	180	Tandes	14	Manukan Wetan	SMA	140
78	Kod.Surabaya	180	Tandes	15	Manukan Kulon	SMA	141
78	Kod.Surabaya	180	Tandes	16	Banjar Sugihan	SMA	142
78	Kod.Surabaya	180	Tandes	17	Buntaran	SMA	143
78	Kod.Surabaya	181	Sukomanunggal	01	Putat Gede	SMA	144
78	Kod.Surabaya	181	Sukomanunggal	02	Sonokwijenan	SMA	145
78	Kod.Surabaya	181	Sukomanunggal	03	Simomulyo	SMA	146
78	Kod.Surabaya	181	Sukomanunggal	04	Sukomanunggal	SMA	147
78	Kod.Surabaya	181	Sukomanunggal	05	Tanjungsari	SMA	148
78	Kod.Surabaya	182	Asemrowo	01	Tambak Langon	SMA	149
78	Kod.Surabaya	182	Asemrowo	02	Greges	SMA	150
78	Kod.Surabaya	182	Asemrowo	03	Asemrowo	SMA	151
78	Kod.Surabaya	182	Asemrowo	04	Genting	SMA	152
78	Kod.Surabaya	182	Asemrowo	05	Kalianak	SMA	153
78	Kod.Surabaya	190	Benowo	01	Benowo	SMA	154
78	Kod.Surabaya	190	Benowo	02	Pakal	SMA	155
78	Kod.Surabaya	190	Benowo	03	Babat Jerawat	SMA	156
78	Kod.Surabaya	190	Benowo	04	Sememi	SMA	157
78	Kod.Surabaya	190	Benowo	05	Klakarejo	SMA	158
78	Kod.Surabaya	190	Benowo	06	Kandangan	SMA	159
78	Kod.Surabaya	190	Benowo	07	Tambakoso Wilangun	SMA	160
78	Kod.Surabaya	190	Benowo	08	Romo Kalisari	SMA	161
78	Kod.Surabaya	190	Benowo	09	Tambak Dono	SMA	162
78	Kod.Surabaya	190	Benowo	10	Sumber Rejo	SMA	163
15	Sidoarjo	70	Candi	1	Karangtan	SMA	216
15	Sidoarjo	70	Candi	2	Sumorame	SMA	216
15	Sidoarjo	70	Candi	3	Ngampelsa	SMA	216
15	Sidoarjo	70	Candi	4	Balonggab	SMA	216
15	Sidoarjo	70	Candi	5	Bolongdow	SMA	216
15	Sidoarjo	70	Candi	6	Kendalpec	SMA	216
15	Sidoarjo	70	Candi	7	Kedungpel	SMA	216
15	Sidoarjo	70	Candi	8	Kalipecab	SMA	216
15	Sidoarjo	70	Candi	9	Klurak	SMA	216
15	Sidoarjo	70	Candi	10	Kebonsari	SMA	216
15	Sidoarjo	70	Candi	11	Gelam	SMA	216

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
15	Sidoarjo	70	Candi	12	Candi	SMA	216
15	Sidoarjo	70	Candi	13	Sugihwara	SMA	216
15	Sidoarjo	70	Candi	14	Kedungkeu	SMA	216
15	Sidoarjo	70	Candi	15	Durungban	SMA	216
15	Sidoarjo	70	Candi	16	Durungbed	SMA	216
15	Sidoarjo	70	Candi	17	Jambangan	SMA	216
15	Sidoarjo	70	Candi	18	Sidodadi	SMA	216
15	Sidoarjo	70	Candi	19	Sepande	SMA	216
15	Sidoarjo	70	Candi	20	Sumokali	SMA	216
15	Sidoarjo	70	Candi	21	Tenggulun	SMA	216
15	Sidoarjo	70	Candi	22	Blingo	SMA	216
15	Sidoarjo	70	Candi	23	Wedoloklu	SMA	216
15	Sidoarjo	70	Candi	24	Larangan	SMA	216
15	Sidoarjo	90	Wonoayu	1	Simoketaw	SMA	205
15	Sidoarjo	90	Wonoayu	2	Popoh	SMA	205
15	Sidoarjo	90	Wonoayu	3	Jimbaran	SMA	205
15	Sidoarjo	90	Wonoayu	4	Ketimang	SMA	205
15	Sidoarjo	90	Wonoayu	5	Pilang	SMA	205
15	Sidoarjo	90	Wonoayu	6	Sumberejo	SMA	205
15	Sidoarjo	90	Wonoayu	7	Mojoranga	SMA	205
15	Sidoarjo	90	Wonoayu	8	Wonokasih	SMA	205
15	Sidoarjo	90	Wonoayu	9	Ploso	SMA	205
15	Sidoarjo	90	Wonoayu	10	Jimbaran	SMA	205
15	Sidoarjo	90	Wonoayu	11	Wonoayu	SMA	205
15	Sidoarjo	90	Wonoayu	12	Semambung	SMA	205
15	Sidoarjo	90	Wonoayu	13	Simo Angi	SMA	205
15	Sidoarjo	90	Wonoayu	14	Tanggul	SMA	205
15	Sidoarjo	90	Wonoayu	15	Wonokalan	SMA	205
15	Sidoarjo	90	Wonoayu	16	Pagerngum	SMA	205
15	Sidoarjo	90	Wonoayu	17	Plaosan	SMA	205
15	Sidoarjo	90	Wonoayu	18	Mulyodadi	SMA	205
15	Sidoarjo	90	Wonoayu	19	Lambangan	SMA	205
15	Sidoarjo	90	Wonoayu	20	Sawocangk	SMA	205
15	Sidoarjo	90	Wonoayu	21	Becironge	SMA	205
15	Sidoarjo	90	Wonoayu	22	Karangpur	SMA	205
15	Sidoarjo	90	Wonoayu	23	Candinego	SMA	205
15	Sidoarjo	100	Sukodono	1	Wilayut	SMA	206
15	Sidoarjo	100	Sukodono	2	Kebonagun	SMA	206
15	Sidoarjo	100	Sukodono	3	Anggaswan	SMA	206
15	Sidoarjo	100	Sukodono	4	Jumputrej	SMA	206
15	Sidoarjo	100	Sukodono	5	Suruh	SMA	206
15	Sidoarjo	100	Sukodono	6	Pekarunga	SMA	206
15	Sidoarjo	100	Sukodono	7	Pademoneg	SMA	206
15	Sidoarjo	100	Sukodono	8	Cankrings	SMA	206
15	Sidoarjo	100	Sukodono	9	Jogosatru	SMA	206
15	Sidoarjo	100	Sukodono	10	Ngaresrej	SMA	206
15	Sidoarjo	100	Sukodono	11	Sambungre	SMA	206
15	Sidoarjo	100	Sukodono	12	Plumbunga	SMA	206
15	Sidoarjo	100	Sukodono	13	Sukodono	SMA	206
15	Sidoarjo	100	Sukodono	14	Keloposep	SMA	206
15	Sidoarjo	100	Sukodono	15	Masangan	SMA	206
15	Sidoarjo	100	Sukodono	16	Suko	SMA	206
15	Sidoarjo	100	Sukodono	17	Masangan	SMA	206
15	Sidoarjo	100	Sukodono	18	Panjunan	SMA	206
15	Sidoarjo	100	Sukodono	19	Bangsri	SMA	206
15	Sidoarjo	110	Sidoarjo	1	Lebo	SMA	204
15	Sidoarjo	110	Sidoarjo	2	Suko	SMA	204
15	Sidoarjo	110	Sidoarjo	3	Banjarben	SMA	204
15	Sidoarjo	110	Sidoarjo	4	Lemahputr	SMA	204

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
15	Sidoarjo	110	Sidoarjo	5	Sidokare	SMA	204
15	Sidoarjo	110	Sidoarjo	6	Celep	SMA	204
15	Sidoarjo	110	Sidoarjo	7	Sekardang	SMA	204
15	Sidoarjo	110	Sidoarjo	8	Gebang	SMA	204
15	Sidoarjo	110	Sidoarjo	9	Rangkah K	SMA	204
15	Sidoarjo	110	Sidoarjo	10	Bulusidok	SMA	204
15	Sidoarjo	110	Sidoarjo	11	Pucangano	SMA	204
15	Sidoarjo	110	Sidoarjo	12	Kauman	SMA	204
15	Sidoarjo	110	Sidoarjo	13	Sidoklump	SMA	204
15	Sidoarjo	110	Sidoarjo	14	Sidokumpu	SMA	204
15	Sidoarjo	110	Sidoarjo	15	Blurukidu	SMA	204
15	Sidoarjo	110	Sidoarjo	16	Kemiri	SMA	204
15	Sidoarjo	110	Sidoarjo	17	Pucang	SMA	204
15	Sidoarjo	110	Sidoarjo	18	Magersari	SMA	204
15	Sidoarjo	110	Sidoarjo	19	Jati	SMA	204
15	Sidoarjo	110	Sidoarjo	20	Cemeng Ka	SMA	204
15	Sidoarjo	110	Sidoarjo	21	Cemeng Ba	SMA	204
15	Sidoarjo	110	Sidoarjo	22	Urangagun	SMA	204
15	Sidoarjo	110	Sidoarjo	23	Sarirogo	SMA	204
15	Sidoarjo	110	Sidoarjo	24	Sumput	SMA	204
15	Sidoarjo	120	Buduran	1	Entalsewu	SMA	203
15	Sidoarjo	120	Buduran	2	Pagerwojo	SMA	203
15	Sidoarjo	120	Buduran	3	Sidokerto	SMA	203
15	Sidoarjo	120	Buduran	4	Sidokepun	SMA	203
15	Sidoarjo	120	Buduran	5	Sukorejo	SMA	203
15	Sidoarjo	120	Buduran	6	Buduran	SMA	203
15	Sidoarjo	120	Buduran	7	Siwalanpa	SMA	203
15	Sidoarjo	120	Buduran	8	Sidomulyo	SMA	203
15	Sidoarjo	120	Buduran	9	Prasung	SMA	203
15	Sidoarjo	120	Buduran	10	Sawohan	SMA	203
15	Sidoarjo	120	Buduran	11	Damarsi	SMA	203
15	Sidoarjo	120	Buduran	12	Dukuhteng	SMA	203
15	Sidoarjo	120	Buduran	13	Banjarsar	SMA	203
15	Sidoarjo	120	Buduran	14	Wadungasi	SMA	203
15	Sidoarjo	120	Buduran	15	Banjar Ke	SMA	203
15	Sidoarjo	130	Sedati	12	Pabean	SMA	194
15	Sidoarjo	130	Sedati	11	Sedatiged	SMA	195
15	Sidoarjo	130	Sedati	13	Semampir	SMA	196
15	Sidoarjo	130	Sedati	14	Pranti	SMA	197
15	Sidoarjo	130	Sedati	15	Segorotam	SMA	198
15	Sidoarjo	130	Sedati	10	Sedatiagu	SMA	199
15	Sidoarjo	130	Sedati	9	Bandara J	SMA	200
15	Sidoarjo	130	Sedati	9	Betro	SMA	200
15	Sidoarjo	130	Sedati	1	Kwangsan	SMA	201
15	Sidoarjo	130	Sedati	2	Pepe	SMA	202
15	Sidoarjo	130	Sedati	3	Buncitan	SMA	202
15	Sidoarjo	130	Sedati	4	Kalangany	SMA	202
15	Sidoarjo	130	Sedati	5	Tambakcem	SMA	202
15	Sidoarjo	130	Sedati	6	Gisik Cem	SMA	202
15	Sidoarjo	130	Sedati	7	Cemandi	SMA	202
15	Sidoarjo	130	Sedati	8	Pulungan	SMA	202
15	Sidoarjo	130	Sedati	16	Banjarkem	SMA	202
15	Sidoarjo	140	Waru	9	Tambakoso	SMA	164
15	Sidoarjo	140	Waru	10	Tambaksum	SMA	165
15	Sidoarjo	140	Waru	11	Wadungasr	SMA	166
15	Sidoarjo	140	Waru	12	Berbek	SMA	167
15	Sidoarjo	140	Waru	14	Wedoro	SMA	168
15	Sidoarjo	140	Waru	15	Janti	SMA	169
15	Sidoarjo	140	Waru	16	Kedungrej	SMA	170

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
15	Sidoarjo	140	Waru	17	Bungurasi	SMA	171
15	Sidoarjo	140	Waru	2	Medaeng	SMA	172
15	Sidoarjo	140	Waru	1	Pepelegi	SMA	173
15	Sidoarjo	140	Waru	3	Waru	SMA	174
15	Sidoarjo	140	Waru	4	Kureksari	SMA	175
15	Sidoarjo	140	Waru	5	Ngingas	SMA	176
15	Sidoarjo	140	Waru	13	Kepuhkiri	SMA	177
15	Sidoarjo	140	Waru	6	Tropodo	SMA	178
15	Sidoarjo	140	Waru	7	Tambaksaw	SMA	179
15	Sidoarjo	140	Waru	8	Tambakrej	SMA	180
15	Sidoarjo	150	Gedangan	14	Sawotrata	SMA	189
15	Sidoarjo	150	Gedangan	15	Bangah	SMA	189
15	Sidoarjo	150	Gedangan	13	Semambung	SMA	190
15	Sidoarjo	150	Gedangan	12	Wedi	SMA	191
15	Sidoarjo	150	Gedangan	11	Ketajen	SMA	192
15	Sidoarjo	150	Gedangan	1	Ganting	SMA	193
15	Sidoarjo	150	Gedangan	2	Karangbon	SMA	193
15	Sidoarjo	150	Gedangan	3	Tebel	SMA	193
15	Sidoarjo	150	Gedangan	4	Kragan	SMA	193
15	Sidoarjo	150	Gedangan	5	Gemurung	SMA	193
15	Sidoarjo	150	Gedangan	6	Punggul	SMA	193
15	Sidoarjo	150	Gedangan	7	Sruni	SMA	193
15	Sidoarjo	150	Gedangan	8	Keboan An	SMA	193
15	Sidoarjo	150	Gedangan	9	Keboansik	SMA	193
15	Sidoarjo	150	Gedangan	10	Gedangan	SMA	193
15	Sidoarjo	160	Taman	24	Sepanjang	SMA	181
15	Sidoarjo	160	Taman	23	Bebekan	SMA	182
15	Sidoarjo	160	Taman	22	Wonocolo	SMA	183
15	Sidoarjo	160	Taman	21	Ngelom	SMA	184
15	Sidoarjo	160	Taman	7	Geluran	SMA	185
15	Sidoarjo	160	Taman	11	Ketegan	SMA	185
15	Sidoarjo	160	Taman	13	Klijaten	SMA	185
15	Sidoarjo	160	Taman	12	Taman	SMA	186
15	Sidoarjo	160	Taman	8	Kedungtur	SMA	187
15	Sidoarjo	160	Taman	9	Wage	SMA	187
15	Sidoarjo	160	Taman	10	Bohar	SMA	187
15	Sidoarjo	160	Taman	1	Kramatjeg	SMA	188
15	Sidoarjo	160	Taman	2	Sidodadi	SMA	188
15	Sidoarjo	160	Taman	3	Bringinbe	SMA	188
15	Sidoarjo	160	Taman	4	Sambibulu	SMA	188
15	Sidoarjo	160	Taman	5	Sadang	SMA	188
15	Sidoarjo	160	Taman	6	Jemundo	SMA	188
15	Sidoarjo	160	Taman	14	Kletek	SMA	188
15	Sidoarjo	160	Taman	15	Gilang	SMA	188
15	Sidoarjo	160	Taman	16	Tanjungsa	SMA	188
15	Sidoarjo	160	Taman	17	Trosobo	SMA	188
15	Sidoarjo	160	Taman	18	Pertapan	SMA	188
15	Sidoarjo	160	Taman	19	Krembanga	SMA	188
15	Sidoarjo	160	Taman	20	Tawangsar	SMA	188
15	Sidoarjo	170	Krian	1	Tropodo	SMA	207
15	Sidoarjo	170	Krian	2	Katerunga	SMA	207
15	Sidoarjo	170	Krian	3	Jerukgamp	SMA	207
15	Sidoarjo	170	Krian	4	Sedenganm	SMA	207
15	Sidoarjo	170	Krian	5	Gamping	SMA	207
15	Sidoarjo	170	Krian	6	Terik	SMA	207
15	Sidoarjo	170	Krian	7	Junwangi	SMA	207
15	Sidoarjo	170	Krian	8	Terungkul	SMA	207
15	Sidoarjo	170	Krian	9	Terungwet	SMA	207
15	Sidoarjo	170	Krian	10	Jatikalan	SMA	207

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
15	Sidoarjo	170	Krian	11	Keboharan	SMA	207
15	Sidoarjo	170	Krian	12	Ponokawan	SMA	207
15	Sidoarjo	170	Krian	13	Kremasan	SMA	207
15	Sidoarjo	170	Krian	14	Krian	SMA	207
15	Sidoarjo	170	Krian	15	Kraton	SMA	207
15	Sidoarjo	170	Krian	16	Sidomulyo	SMA	207
15	Sidoarjo	170	Krian	17	Tambak Ke	SMA	207
15	Sidoarjo	170	Krian	18	Sidomojo	SMA	207
15	Sidoarjo	170	Krian	19	Watugolon	SMA	207
15	Sidoarjo	170	Krian	20	Tempel	SMA	207
15	Sidoarjo	170	Krian	21	Barengkra	SMA	207
15	Sidoarjo	170	Krian	22	Sidorejo	SMA	207
25	Gresik	20	Driyorejo	1	Krikilan	SMA	217
25	Gresik	20	Driyorejo	2	Driorejo	SMA	218
25	Gresik	20	Driyorejo	3	Cangkir	SMA	219
25	Gresik	20	Driyorejo	4	Bambu	SMA	220
25	Gresik	20	Driyorejo	5	Mulung	SMA	221
25	Gresik	20	Driyorejo	6	Tenaru	SMA	222
25	Gresik	20	Driyorejo	7	Petiken	SMA	222
25	Gresik	20	Driyorejo	8	Kesambenw	SMA	222
25	Gresik	20	Driyorejo	9	Sumput	SMA	222
25	Gresik	20	Driyorejo	10	Tanjungan	SMA	223
25	Gresik	20	Driyorejo	11	Banjaran	SMA	223
25	Gresik	20	Driyorejo	12	Karangand	SMA	223
25	Gresik	20	Driyorejo	13	Mojosarir	SMA	223
25	Gresik	20	Driyorejo	14	Wedoroano	SMA	223
25	Gresik	20	Driyorejo	15	Randegans	SMA	223
25	Gresik	20	Driyorejo	16	Gadung	SMA	224
25	Gresik	60	Menganti	1	Pranti	SMA	233
25	Gresik	60	Menganti	2	Bringkang	SMA	233
25	Gresik	60	Menganti	3	Mojotenga	SMA	233
25	Gresik	60	Menganti	4	Menganti	SMA	233
25	Gresik	60	Menganti	5	Hulakan	SMA	233
25	Gresik	60	Menganti	6	Sidowungu	SMA	233
25	Gresik	60	Menganti	7	Setro	SMA	233
25	Gresik	60	Menganti	8	Laban	SMA	233
25	Gresik	60	Menganti	9	Pengalang	SMA	233
25	Gresik	60	Menganti	10	Radupadan	SMA	233
25	Gresik	60	Menganti	11	Drancang	SMA	234
25	Gresik	60	Menganti	12	Palemwatu	SMA	234
25	Gresik	60	Menganti	13	Sidojangk	SMA	234
25	Gresik	60	Menganti	14	Domas	SMA	234
25	Gresik	60	Menganti	15	Gadingwal	SMA	234
25	Gresik	60	Menganti	16	Beton	SMA	235
25	Gresik	60	Menganti	17	Putatlor	SMA	235
25	Gresik	60	Menganti	18	Boteng	SMA	235
25	Gresik	60	Menganti	19	Boboh	SMA	236
25	Gresik	60	Menganti	20	Gempelkur	SMA	236
25	Gresik	60	Menganti	21	Kepatihan	SMA	236
25	Gresik	60	Menganti	22	Hendrosar	SMA	236
25	Gresik	70	Cerme	1	Dadapkuni	SMA	237
25	Gresik	70	Cerme	2	Ngembung	SMA	237
25	Gresik	70	Cerme	3	Sukoanyar	SMA	237
25	Gresik	70	Cerme	4	Morowudi	SMA	237
25	Gresik	70	Cerme	5	Gurangany	SMA	237
25	Gresik	70	Cerme	6	Dampaan	SMA	237
25	Gresik	70	Cerme	7	Dooro	SMA	237
25	Gresik	70	Cerme	8	Lengkong	SMA	237
25	Gresik	70	Cerme	9	Kandangan	SMA	237

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
25	Gresik	70	Cerme	10	Dungus	SMA	237
25	Gresik	70	Cerme	11	Ngabetan	SMA	238
25	Gresik	70	Cerme	12	Betiting	SMA	238
25	Gresik	70	Cerme	13	Iker-Iker	SMA	238
25	Gresik	70	Cerme	14	Cermekidu	SMA	238
25	Gresik	70	Cerme	15	Pandu	SMA	238
25	Gresik	70	Cerme	16	Jono	SMA	238
25	Gresik	70	Cerme	17	Tambakber	SMA	238
25	Gresik	70	Cerme	18	Cermelor	SMA	238
25	Gresik	70	Cerme	19	Cagakagun	SMA	238
25	Gresik	70	Cerme	20	Semampir	SMA	238
25	Gresik	70	Cerme	21	Kambingan	SMA	238
25	Gresik	70	Cerme	22	Wedani	SMA	238
25	Gresik	70	Cerme	23	Godangkul	SMA	238
25	Gresik	70	Cerme	24	Padeg	SMA	238
25	Gresik	70	Cerme	25	Banjarsar	SMA	238
25	Gresik	90	Kebomas	1	Kedanyang	SMA	239
25	Gresik	90	Kebomas	2	Prambanga	SMA	239
25	Gresik	90	Kebomas	3	Gulomantu	SMA	240
25	Gresik	90	Kebomas	4	Sukorejo	SMA	240
25	Gresik	90	Kebomas	5	Segoromad	SMA	240
25	Gresik	90	Kebomas	6	Tenggulun	SMA	241
25	Gresik	90	Kebomas	7	Karangker	SMA	242
25	Gresik	90	Kebomas	8	Indro	SMA	243
25	Gresik	90	Kebomas	9	Singosari	SMA	243
25	Gresik	90	Kebomas	10	Sidomoro	SMA	243
25	Gresik	90	Kebomas	11	Gending	SMA	243
25	Gresik	90	Kebomas	12	Ngargosar	SMA	243
25	Gresik	90	Kebomas	13	Kawisanya	SMA	243
25	Gresik	90	Kebomas	14	Sidamukti	SMA	243
25	Gresik	90	Kebomas	15	Giri	SMA	244
25	Gresik	90	Kebomas	16	Klangonan	SMA	245
25	Gresik	90	Kebomas	17	Sekarkuru	SMA	245
25	Gresik	90	Kebomas	18	Kembangan	SMA	245
25	Gresik	90	Kebomas	19	Dahanrejo	SMA	245
25	Gresik	90	Kebomas	20	Randuagun	SMA	246
25	Gresik	90	Kebomas	21	Kebomas	SMA	247
25	Gresik	100	Gresik	1	Ngipik	SMA	248
25	Gresik	100	Gresik	2	Tlogopatu	SMA	248
25	Gresik	100	Gresik	3	Sidokumpu	SMA	248
25	Gresik	100	Gresik	4	Kramat In	SMA	248
25	Gresik	100	Gresik	5	Sidorukun	SMA	248
25	Gresik	100	Gresik	6	Sumengko	SMA	248
25	Gresik	100	Gresik	7	Gapuro Su	SMA	249
25	Gresik	100	Gresik	8	Tlogobend	SMA	249
25	Gresik	100	Gresik	9	Pekauman	SMA	249
25	Gresik	100	Gresik	10	Sukorame	SMA	250
25	Gresik	100	Gresik	11	Karangtur	SMA	250
25	Gresik	100	Gresik	12	Trate	SMA	250
25	Gresik	100	Gresik	13	Karangpoh	SMA	250
25	Gresik	100	Gresik	14	Bedilan	SMA	251
25	Gresik	100	Gresik	15	Kebungson	SMA	251
25	Gresik	100	Gresik	16	Pekelinga	SMA	251
25	Gresik	100	Gresik	17	Kemuteran	SMA	251
25	Gresik	100	Gresik	18	Sukodono	SMA	251
25	Gresik	100	Gresik	19	Kroman	SMA	251
25	Gresik	100	Gresik	20	Lumpur	SMA	251
25	Gresik	100	Gresik	21	Tlogopojo	SMA	251
25	Gresik	100	Gresik	22	Tepen	SMA	251

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
25	Gresik	10	Wringinan	1	Kedungany	GKS	225
25	Gresik	10	Wringinan	2	Sumberram	GKS	226
25	Gresik	10	Wringinan	3	Wringanom	GKS	226
25	Gresik	10	Wringinan	4	Lebanisuk	GKS	227
25	Gresik	10	Wringinan	5	Lobaniwar	GKS	227
25	Gresik	10	Wringinan	6	Sumengko	GKS	227
25	Gresik	10	Wringinan	7	Pasinanle	GKS	227
25	Gresik	10	Wringinan	8	Watestanj	GKS	227
25	Gresik	10	Wringinan	9	Pedaganga	GKS	228
25	Gresik	10	Wringinan	10	Sembung	GKS	228
25	Gresik	10	Wringinan	11	Sumberwar	GKS	228
25	Gresik	10	Wringinan	12	Kepuhklag	GKS	228
25	Gresik	10	Wringinan	13	Sumberged	GKS	229
25	Gresik	10	Wringinan	14	Mondoluku	GKS	229
25	Gresik	10	Wringinan	15	Kesambenk	GKS	229
25	Gresik	10	Wringinan	16	Soko	GKS	229
25	Gresik	30	Kedamean	1	Mojowuku	GKS	230
25	Gresik	30	Kedamean	2	Sidorahar	GKS	230
25	Gresik	30	Kedamean	3	Slempit	GKS	231
25	Gresik	30	Kedamean	4	Belahanre	GKS	231
25	Gresik	30	Kedamean	5	Menunggal	GKS	232
25	Gresik	30	Kedamean	6	Banyuurip	GKS	232
25	Gresik	30	Kedamean	7	Ngepung	GKS	232
25	Gresik	30	Kedamean	8	Kedamean	GKS	232
25	Gresik	30	Kedamean	9	Tanjung	GKS	232
25	Gresik	30	Kedamean	10	Katimoho	GKS	232
25	Gresik	30	Kedamean	11	Turirejo	GKS	232
25	Gresik	30	Kedamean	12	Tulung	GKS	232
25	Gresik	30	Kedamean	13	Glindah	GKS	232
25	Gresik	30	Kedamean	14	Lampah	GKS	232
25	Gresik	30	Kedamean	15	Cermenler	GKS	232
26	Bangkalan	10	Kamal			SMA	261
26	Bangkalan	20	Labang			SMA	262
26	Bangkalan	110	Bangkalan			SMA	270
15	Sidoarjo	10	Tarik			GKS	208
15	Sidoarjo	20	Prambon			GKS	209
15	Sidoarjo	30	Krembung			GKS	211
15	Sidoarjo	40	Porong			GKS	213
15	Sidoarjo	50	Jabon			GKS	214
15	Sidoarjo	60	Tanggulangin			GKS	215
15	Sidoarjo	80	Tulangan			GKS	212
15	Sidoarjo	180	Balongbendo			GKS	210
25	Gresik	40	Balongpanggang			GKS	259
25	Gresik	50	Benjeng			GKS	260
25	Gresik	80	Duduksampeyan			GKS	258
25	Gresik	110	Manyar			GKS	252
25	Gresik	120	Bungah			GKS	253
25	Gresik	130	Sidayu			GKS	254
25	Gresik	140	Dukun			GKS	255
25	Gresik	150	Panceng			GKS	256
25	Gresik	160	Ujungpangkah			GKS	257
26	Bangkalan	30	Kwanyar			GKS	263
26	Bangkalan	40	Modung			GKS	264
26	Bangkalan	50	Blega			GKS	265
26	Bangkalan	60	Konang			GKS	266
26	Bangkalan	70	Galis			GKS	267
26	Bangkalan	80	Tanahmerah			GKS	268
26	Bangkalan	90	Tragah			GKS	269
26	Bangkalan	110	Bangkalan			GKS	271

Code_2	Kab_Kod	Code_3	Kec	Code_4	Kel_Desa	SMA/GKS	Traffic-Zone
26	Bangkalan	120	Burneh			GKS	272
26	Bangkalan	130	Arosbaya			GKS	273
26	Bangkalan	140	Geger			GKS	274
26	Bangkalan	150	Kokop			GKS	275
26	Bangkalan	160	Tanjungbumi			GKS	276
26	Bangkalan	170	Sepuluh			GKS	277
26	Bangkalan	180	Klampis			GKS	278
24	Lamongan	10	Blubuk			GKS	289
24	Lamongan	11	Sukorame			GKS	289
24	Lamongan	20	Ngimbang			GKS	290
24	Lamongan	30	Sambeng			GKS	290
24	Lamongan	40	Mantup			GKS	291
24	Lamongan	50	Kambangbahu			GKS	292
24	Lamongan	60	Sugio			GKS	293
24	Lamongan	70	Kedungpring			GKS	293
24	Lamongan	80	Modo			GKS	293
24	Lamongan	90	Babat			GKS	294
24	Lamongan	100	Sukodadi 1			GKS	295
24	Lamongan	101	Sukodadi 2			GKS	295
24	Lamongan	110	Lamongan			GKS	296
24	Lamongan	120	Tikung			GKS	292
24	Lamongan	130	Deket			GKS	296
24	Lamongan	140	Glagah			GKS	297
24	Lamongan	150	Karangbinangun			GKS	298
24	Lamongan	160	Kalitengah			GKS	299
24	Lamongan	170	Turi			GKS	296
24	Lamongan	180	Karanggeneng			GKS	299
24	Lamongan	190	Sekaran			GKS	294
24	Lamongan	200	Laren			GKS	300
24	Lamongan	210	Brondong			GKS	300
24	Lamongan	220	Paciran 1			GKS	301
24	Lamongan	221	Paciran 2			GKS	301
76	Kod.Mojokerto	10	Prajurit Kulon			GKS	288
76	Kod.Mojokerto	20	Magersari			GKS	288
16	Mojokerto	10	Jatirejo			GKS	279
16	Mojokerto	20	Gondang			GKS	280
16	Mojokerto	30	Pacet			GKS	281
16	Mojokerto	40	Trawas			GKS	281
16	Mojokerto	50	Ngoro			GKS	282
16	Mojokerto	60	Pungging			GKS	283
16	Mojokerto	70	Kutorejo			GKS	284
16	Mojokerto	80	Mojosari			GKS	283
16	Mojokerto	90	Bangsal			GKS	283
16	Mojokerto	100	Dlanggu			GKS	280
16	Mojokerto	110	Puri			GKS	285
16	Mojokerto	120	Trowulan			GKS	279
16	Mojokerto	130	Sooko			GKS	286
16	Mojokerto	140	Gedek			GKS	287
16	Mojokerto	150	Kemlagi			GKS	287
16	Mojokerto	160	Jetis			GKS	287
16	Mojokerto	170	Damarblandong			GKS	287

Appendix 6.1 Preliminary Ring Road Proposals

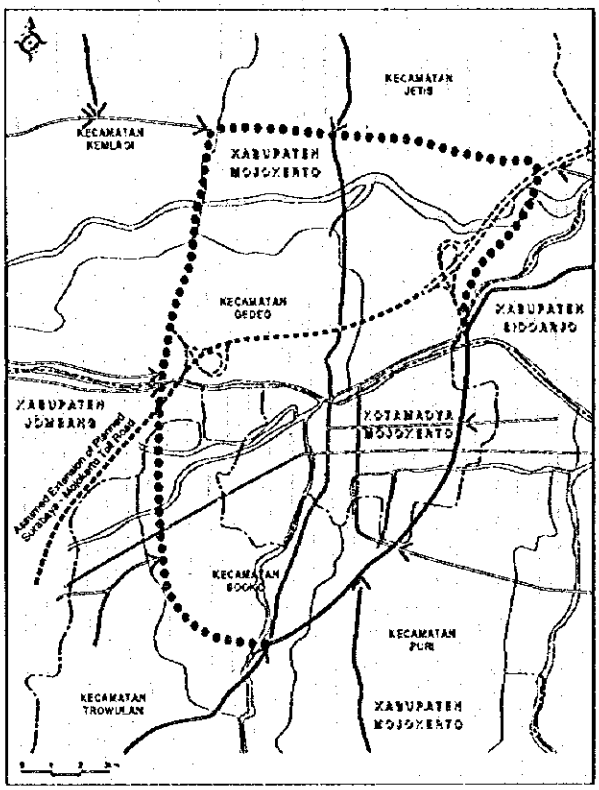

Figure A6.1.1
Preliminary Proposal of Mojokerto Ring Road

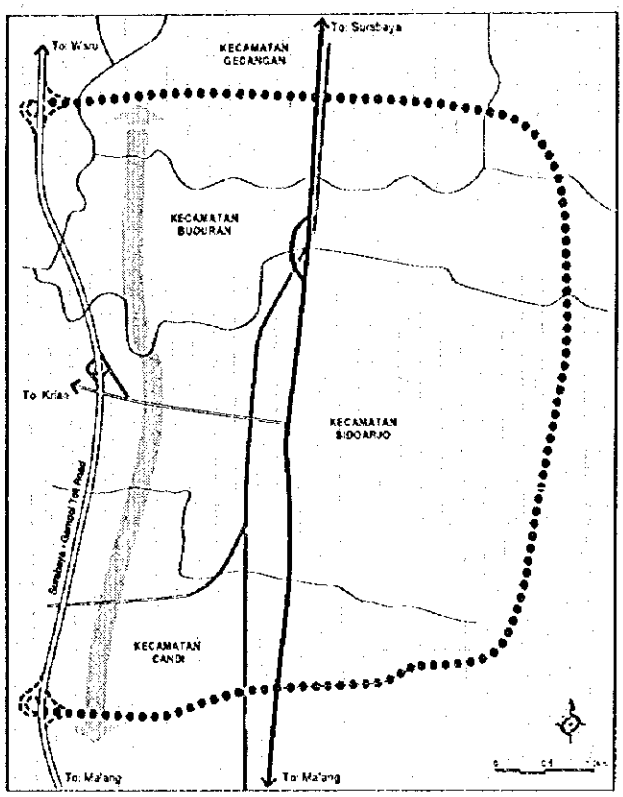

Figure A6.1.2
Preliminary Proposal of Sidoarjo Ring Road

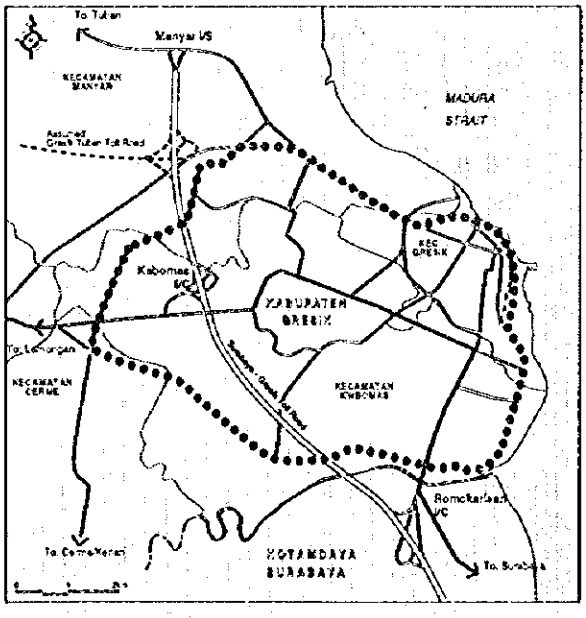

Figure A6.1.3
Preliminary Proposal of Gresik Ring Road

Legend:
- Proposed Ring Road
- Existing National Road