

CHAPTER

3

EXISTING STRUCTURE IN TRAFFIC FLOW

3.1 PERSON TRIP ANALYSES

3.1.1 GENERAL

A home interview survey covering Surabaya city and the major urban areas of GKS Region, was carried out by the Study Team in March, 1982.

Sampling rates in Surabaya and GKS Region were estimated at 1.15% and 0.52% respectively and these rates are relatively low even for Surabaya. However, by knowing the accuracy of the survey results, it is still useful to utilize the analytical survey results to disclose data to supplement the traffic information gained in site surveys. Considering the mathematical margin of sample error in the 17 zones of Surabaya, and a certainty of the answers collected from the sample households, the extent of error in survey results was estimated to be about $\pm 20\%$.

3.1.2 PERSON TRIP RATE

MEAN VALUE OF TRIP RATE

Based on a simple compilation of the survey results, the average trip rate per person was derived to be 1.56 trips/day. This estimate is rather low compared with the experience in Jakarta (2.09 trips/day) ⁽¹⁾ and Tokyo Metropolitan Region (2.53 trips/day) ⁽²⁾.

Notes: (1) "Feasibility Study on Jakarta Harbour Road Project", Nov., 1982, JICA
(2) "Movement in Metro-Tokyo" March, 1980, Tokyo Metropolitan Region Transport Planning Commission.

Accordingly, all the samples obtained in Surabaya were expanded based on the zonal population in 1980. The average trip rate per person derived from the expanded samples showed an even lower trip rate of 1.2 trips/person. Therefore, it was considered that a mean of the samples was biased downwards compared with the real mean. Among the samples, there were "unknown" samples, which did not give answers or gave inconsistent answers. Eventually, these "unknown" samples were eliminated from the total trip numbers and samples as well.

The calculated person trip rate using the above method was 1.85 trip/person. The resulting trip rate of 1.85 trips/person is 18.6% higher than that of the simple average. If the margin of error is allowed at $\pm 20\%$, the estimated trip rate of 1.85 will be acceptable.

Subsequently, trip rates of each attribute of the sampled individuals were prepared but it should be noted that the following figures are results of a simple compilation of sample data. Therefore, trip rates shown here are low as a whole, compared with the mean value estimated previously at 1.85 trips/person.

TRIP RATES BY INDIVIDUAL ATTRIBUTES

The average trip rates for individual attributes are summarized in Table 3.1.1. Observing the samples who gave their work status (A) as "Labour", "Driver" and "Others", it can be seen that they have trip rates less than 1.63 trips/person. Further, "out-door trip" rate (% of samples who made at least one trip per day) in these occupations is less than 80%. This means 2 persons out of 10 did not leave home at all on the survey day.

Regarding the average trip rates by type of industry, item (C) of Table 3.1.1, most of the sample workers made more than 94% of "out-door rate", except for "Others", "Unknown", and "Retail Trade". The sample workers of "managerial occupation" also showed relatively lower "out-door trip" rate but it was conceivable that small shop owners (managerial occupation) who belong to "retail trade", have their work at their residence and did not go out on the survey day.

Accordingly, it can be said that about 95% of regular workers make at least one trip, or more aggressively, that 95% of regular workers made at least 2 trips, namely "Home to work" and "Return Home" trips. The sample of workers of "Labour", "Driver" and "Others", or those who did not give a specific answer to "type of industry", might in-

clude many temporary workers. From the low "outdoor trip" rate, it could be assumed that 20% of them were casual workers not working on the day they were surveyed.

Among the non-worker samples, students and pupils showed very high trip rates and "out-door trip" rates, of more than 2 trips/person and 98% respectively. In contrast with the above, occupations such as "domestic affairs", "unemployed" and "retired" presented very low trip rates, and therefore small out-door trip rates of 0.68 trip/person and 65.9% respectively.

From the results of trip rate analysis the following can be summarized:

- Average trip rate in Surabaya and the urban area of GKS Region can be estimated at 1.85 trips/person.
- Most of the travellers make two trips per person and a small proportion of those make over 2 trips/person. This will mean that most travellers only make a round trip between home and destination, without a drop in somewhere else for a different trip purpose.
- The age group of "more than 20 years of age" showed very low trip rates. This is because non-workers except for students and pupils are usually those in work status of "Domestic Affairs", "Unemployed" and "Retired". It is likely that the existence of "Housemaid/boy" reduces the trip rates of "Wife". In addition, among workers there exists about 10% of workers, who did not make any trips on the survey date, and they must be regarded as casual workers.
- Employment ratio of the samples is calculated as follows:

(a) Sample workers: 9,646

(b) Population of sample household: 33,341
therefore,

Employment ratio (a)/(b) = 28.9% (Samples)

Employment ratio (1) = 37.2% (Statistics in East Java)

Source: (1) "BUKU DATA" Juni, 1982 Kanwil Ditjen Binaguna Propinsi Jawa Timur

As seen above, the employment ratio of the survey samples is lower than that of East Java. Therefore, it is estimated that the trip rate for workers as derived from the survey (1.82 trips/worker) is biased to a lower rate.

Table 3.1.1 TRIP RATES BY INDIVIDUAL ATTRIBUTE

(A) Occupation - 1	Average (1) Trip Rate	Out-door Trip Rate (2)
1. Professional/ Technical Occupation	2.12	97.2%
2. Managerial Occupation	1.84	85.6%
3. Shop/Office Clerk	1.90	93.2%
4. Salesman	2.01	92.5%
5. Labour	1.63	79.9%
6. Farmer/Fisher- man/miner	1.85	90.8%
7. Services	1.93	92.9%
8. Civil Servant	2.09	99.7%
9. Driver	1.63	75.7%
10. Others	1.51	74.0%
Worker Sub-total	1.82	87.1%

(C) Types of Industry	Average Trip Rate	Out-door Trip Rate
1. Agriculture/ Forestry	1.92	94.0%
2. Fishery	2.36	100.0%
3. Quarry/Mining	1.95	89.2%
4. Construction	2.04	96.3%
5. Manufacturing/ Processing	2.01	98.2%
6. Wholesale/Commerce	2.17	96.7%
7. Retail Trade	1.77	86.0%
8. Banking/Insurance	2.02	100.0%
9. Transportation	2.00	93.4%
10. Elect./Water Supply/Gas	1.97	97.4%
11. Entertainment/ Recreation/Service	1.89	87.4%
12. Gov. Administration	2.10	99.7%
13. Others	1.59	76.6%
14. Unknown	1.59	76.2%
Workers	1.82	87.1%

(B) Occupation - 2	Average Trip Rate	Out-door Trip Rate
11. Domestic Affairs	0.77	38.8%
12. Unemployed	0.34	17.4%
13. Retired	0.63	30.9%
14. Primary School	2.01	99.9%
15. Junior High School	2.02	99.6%
16. Senior High School / Technical School	2.06	99.5%
17. University/ College/Further Education	2.09	98.3%
Non-Worker Sub-total	1.41	69.5%
Unknown	1.32	68.1%

(D) Sex	Average Trip Rate	Out-door Trip Rate
1. Male	1.83	88.4%
2. Female	1.29	63.8%
3. Unknown	1.59	78.5%

(E) Age Group	Average Trip Rate	Out-door Trip Rate
1. 6 - 9	1.95	97.5%
2. 10 - 14	1.99	98.3%
3. 15 - 19	1.83	89.5%
4. 20 - 29	1.42	68.6%
5. 30 - 39	1.47	70.7%
6. 40 - 49	1.50	72.5%
7. 50 -	1.03	49.8%
8. Unknown	1.26	65.4%

Note : (1) Trip Rate per person (Total Trips/Sample persons)

(2) % of samples who made at least one trip

3.1.3 DISTRIBUTION OF TRIP PURPOSE AND TRAVEL MODE

TRIP PURPOSE DISTRIBUTION

According to the survey results the distribution of trip purpose is as shown in Table 3.1.2.

Table 3.1.2 DISTRIBUTION OF TRIP PURPOSE

Trip Purpose	Samples	%	Tokyo Metropolitan Study in 1978 (%)
1. Home to work	7,150	17.1	13.4
2. Home to school	9,637	23.1	9.7
3. Business*	1,114	2.7	12.2
4. Return to home	20,057	48.1	40.6
5. Others**	3,787	9.0	24.1
6. Total	41,745	100.0	100.0

Source : Survey results by the Study Team.

Notes : *Including "Collecting/Delivering Goods",
"As part of Work" and "Return to Company".

**Including "Shopping/private affairs",
"Social/recreation" and "Others"

As shown in the above table "Home to work" and "Home to school" trips, which are the major components of morning peak traffic, accounted for 40.2% of the total daily trips.

However, considering the analytical result that the "Home to work" trips derived from the survey samples are low taking account of the employment ratio in East Java, the proportion of "Business" and "Others" trips will be a little lower than those shown in Table 2.1.2. compared with the case in Tokyo Metropolitan Region (TMR), trips of "Business" and "Others" purposes in Surabaya, are already low. Although size of urban area, population and the structure of economy are different between the two urban areas the proportion of these two trip purposes seen to be unduly low and it is possible that this is caused by a bias in type of family surveyed.

HOURLY FLUCTUATION OF TRIP PURPOSES

In order to see how these trip purposes vary during the day, an hourly fluctuation diagram of trip purposes is presented in Fig. 3.1.1. According to this diagram, there are three person trip generation peaks.

The first peak was brought about by "Home to work" and "Home to school" trips during 06:00 - 08:00 in the morning. The second peak comes during 12:00 - 13:00 consisting of "Home to school" trips and the majority of "Return Home" trips, which are mostly from school to home trips. The third peak appears from 16:00 to 18:00, with a major trip purpose of "Return Home", mostly from work to home trips, followed by "Home to school" and "others" trips.

The last two trips are considered to be trips for night school and recreation/shopping. Major shopping areas, amusement area (movie theaters) such as along Jl. Tunjungan, resume or open in the evening. Trips of "Others" purpose which take place in the morning till 11:00 o'clock are conceived to be daily shopping trips to pasars and those during 16:00 to 21:00, seem to be shopping to commercial centers and amusement centers in Surabaya.

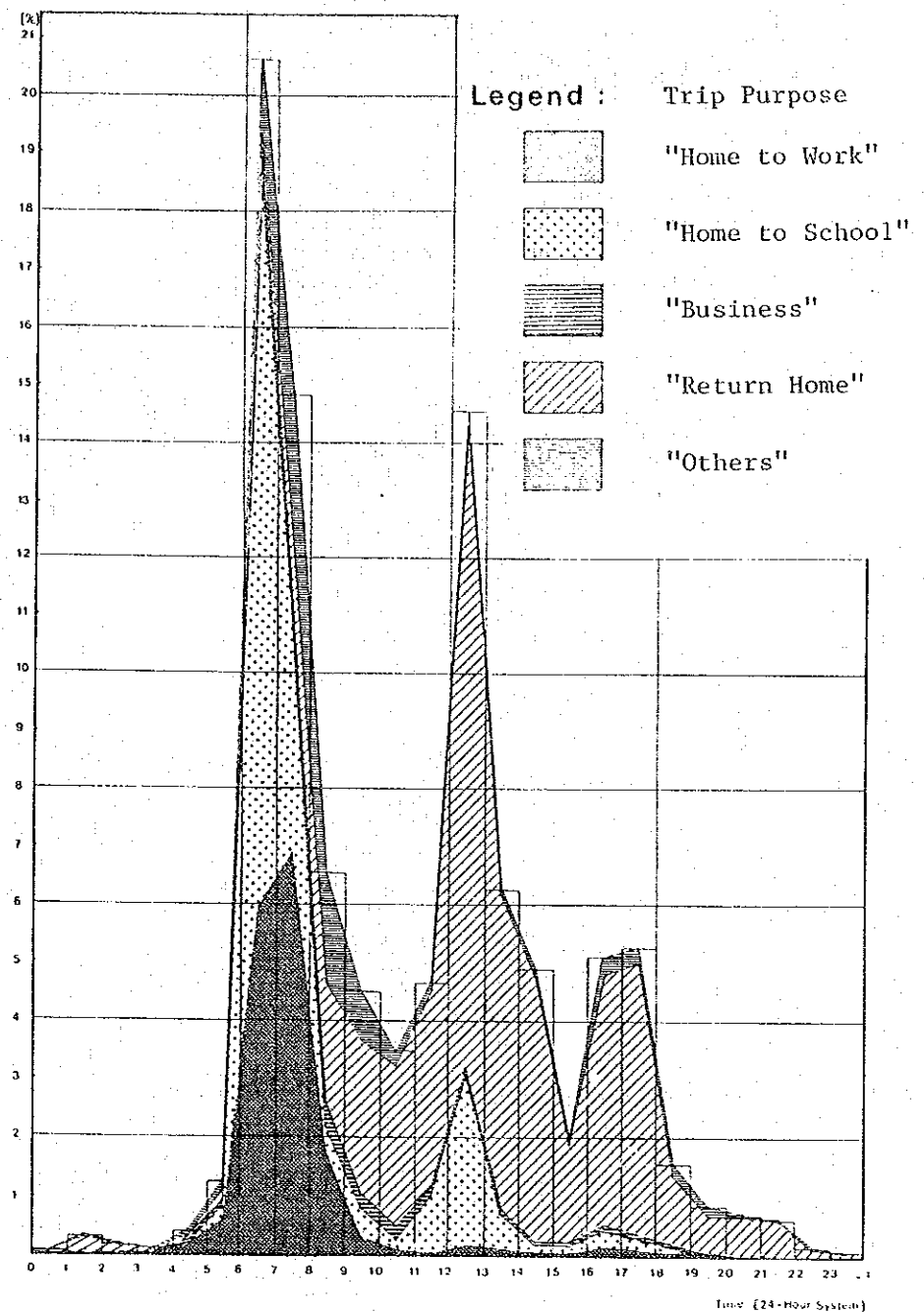


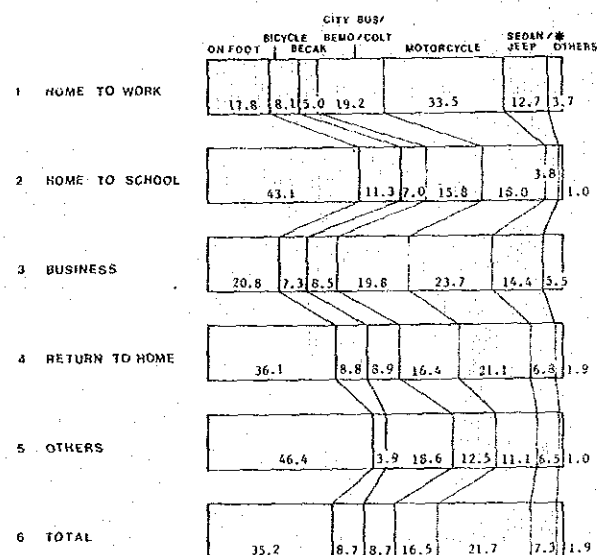
Fig. 3.1.1 HOURLY FLUCTUATION OF TRIP PURPOSE

To trace "Return Home" trips, those before 11:00 o'clock will be occupied by return home trips from daily shopping; those during 12:00 to 13:00 will be return home trips from school; from 13:00 to 15:00 will be return home trips from work for those finishing work at 14:00 such as civil servants; from 16:00 to 18:00 will be those from the second shift school and those from work finishing at 16:00; and the last group of return home trips will be from shopping/recreation and night schools.

"Business" trips are mainly observed during 8:00 to 12:00 with a lesser volume during 16:00 to 18:00. As a whole, most of the activities are concentrated in the morning before noon and until about 16:00, most of the trip purposes are "Return Home" except for second shift school. After 16:00, a minor proportion of "other" purpose trips accrue till 21:00 at night. These patterns of trip behaviour must have been formed based on the regional conditions, culture, social and business customs and so on. The effects of urban development on this trip behaviour should be considered in the course of the planning process.

TRIP PURPOSE AND CHOICE OF TRAVEL MODE

A percentage composition of travel mode for each trip purpose is derived from the Home Interview Survey as shown in Fig. 3.1.2 and Table 3.1.3. The most popular modes for "Home to work" and "Home to school" are "motorcycle" and "on foot" respectively. "Business" trip is mainly made by motorcycle and followed closely by "on foot", "City Bus/Bemo/Colt" and "Sedan/Jeep". Trips of "Others" purpose are made "on foot" for nearly 50% of this trip purpose, followed by "Becak" and "Motorcycle". Nearly half of the travel modes are used for "Return Home" trips, but "Railway" only shares 0.1% of the total trips, or 0.16% excluding "on foot" trips.



Note: * Others include Truck, Inter-city bus, Railway and Ship/Ferry.

Fig. 3.1.2 COMPOSITION OF TRAVEL MODE BY PURPOSE

Table 3.1.3 RELATIONSHIP BETWEEN TRIP PURPOSE AND TRAVEL MODE

(unit : %)

Trip Purposes	On Foot	Bicycle	Becak	Bemo/Colt	City Bus	Motorcycle	Sedan/Jeep	Truck	Inter City Bus	Railway	Ship/Ferry	Total
1. Home to work	17.8	8.1	5.0	14.5	4.7	33.5	12.7	1.4	1.9	0.2	0.2	100.0%
2. Home to school	43.1	11.3	7.0	10.6	5.2	18.0	3.8	0.2	0.7	0.0	0.1	100.0%
3. Business	20.8	7.3	8.5	16.3	3.5	23.7	14.4	2.9	2.2	0.1	0.3	100.0%
4. Return to Home	36.1	8.8	8.9	11.8	4.6	21.1	6.8	0.6	1.1	0.1	0.1	100.0%
5. Others	46.4	3.9	18.6	9.6	2.9	11.1	6.5	0.1	0.5	0.2	0.2	100.0%
	11.9	4.0	19.4	7.3	5.8	4.6	8.2	1.5	4.0	16.3	14.9	9.0
Total	35.2	8.7	8.7	11.9	4.6	21.7	7.3	0.6	1.1	0.1	0.1	100.0%
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0%

3.1.4 DISTRIBUTION OF TRIP TIME AND TRIP DISTANCE

One person trip consists of various modes of travels for a particular trip purpose. According to the Home Interview Survey average travel time for all modes of travel is 17.4 minutes and average trip time of person trips is 19.1 minutes. The average travel distance for all modes of travel and average trip distance of person trips, are 4.7 Km and 5.1 km respectively. These are derived from the distribution of travel time by mode as shown in Fig. 3.1.3 and Table 3.1.4 and assume the travel speed of individual modes is as follows:

- On foot : 4 Km/hr
- Bicycle : 13 Km/hr
- Motorcycle : 23 Km/hr
- Becak : 12 Km/hr
- Bemo/Colt : 17 Km/hr
- Sedan/Jeep : 25 Km/hr (Travel Speed Survey Result)
- City Bus : 17 Km/hr (Bus Occupancy Survey Result)
- Inter-city Bus : 17 Km/hr under 40 min. travel and 40 Km/hr over 40 min. travel
- Railway : 35 Km/hr
- Ship/Ferry : 6 Km/hr
- Light Truck : 23 Km/hr
- Heavy Truck : 17 Km/hr

A distribution of travel distance by mode is presented in terms of percentage distribution and accumulated percentage as shown in Figs. 3.1.4 and 3.1.5.

Referring to Figs. 3.1.3 through 3.1.5, the following characteristics of travel mode are found:

- Most of the modes show a drastic drop in single-mode travel demand at 30 to 40 minutes travel time. This will mean that the area enclosed by 30 to 40 minutes travel time is some activity unit area of the residents and those who make more than 30-40 minutes travel intend to make inter-regional activities. Means of private transportation including "on foot" and bicycle, mostly terminate the travel within 30-40 minutes travel time. Means of public transportation mostly serving the area activities are classified as becak, city bus, and bemo/colt.

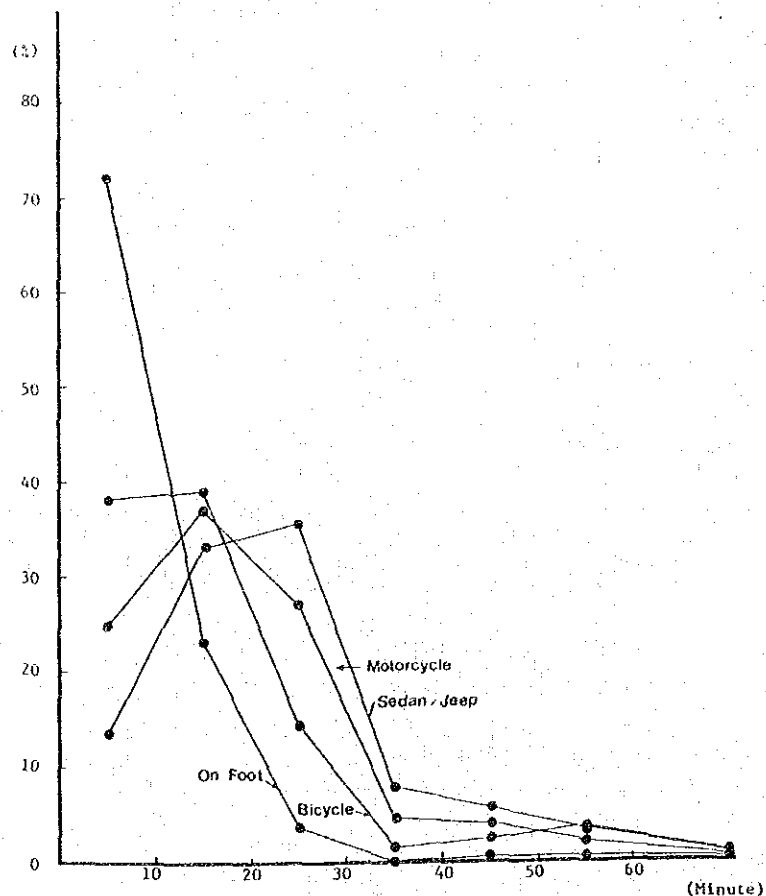
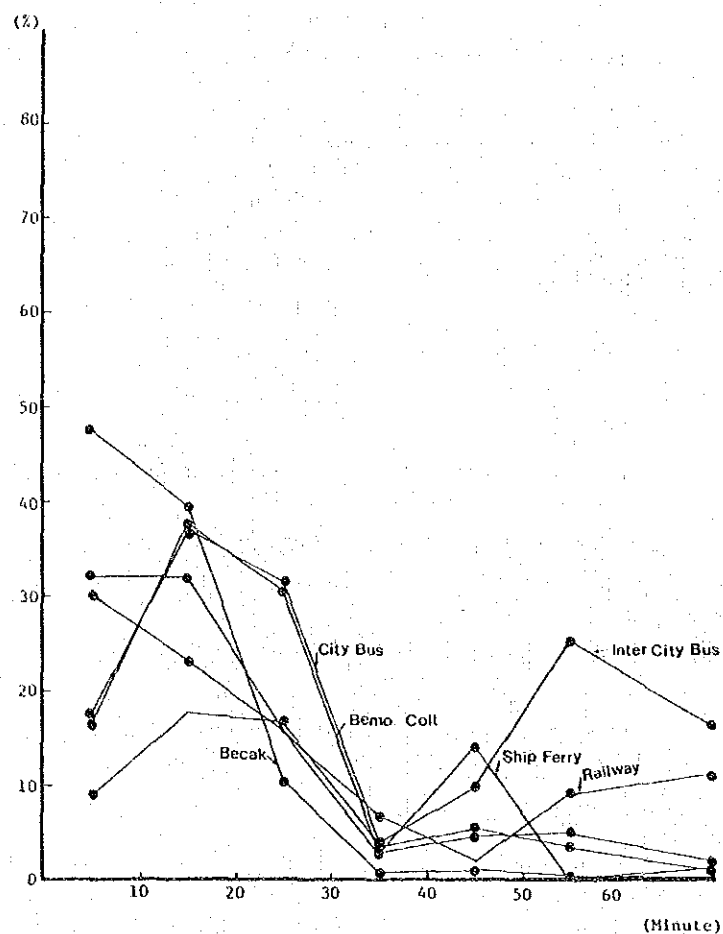


Fig. 3.1.3 DISTRIBUTION OF TRAVEL TIME BY MODE

– Comparing Fig. 3.1.4 with Fig. 3.1.5, the difference in travel distances between mean value and 85 percentile value increase as the average distance increases. As the travel distance changes, composition of travel purpose also changes as previously presented in Table 3.1.3.

– 85% of the city bus and bemo/colt passengers are now making a public transport journey of less than 7 Km. The development of an urban area radially, requires transport facilities to develop exponentially. Therefore, if the urban area expands to 20 Km in radius and a single travel mode is expected of not more than 30 minutes duration, a mode with travel speed of 40 Km/hr and with a large transport capacity will be required.

Table 3.1.4 DISTRIBUTION OF TRAVEL TIME BY MODE

Mode	Samples	Average Trip Time (minute)	Trip Length Time (Minute)						
			-10	-20	-30	-40	-50	-60	60-
1. On Foot	17,955	10.6	12,948 (72.1)	4,147 (23.1)	669 (3.7)	32 (0.2)	73 (0.4)	67 (0.4)	19 (0.1)
2. Bicycle	3,695	18.2	1,411 (38.2)	1,440 (39.0)	536 (14.5)	64 (1.7)	87 (2.4)	129 (3.5)	28 (0.8)
3. Motorcycle	9,158	21.1	2,274 (24.8)	2,406 (26.2)	2,482 (27.1)	427 (4.7)	353 (3.9)	186 (2.0)	30 (0.3)
4. Becak	3,672	14.6	1,744 (47.5)	1,448 (39.4)	390 (10.6)	29 (0.8)	41 (1.1)	16 (0.4)	4 (0.1)
5. Bemo/Colt	5,057	24.7	845 (16.7)	1,910 (37.8)	1,555 (30.7)	158 (3.1)	239 (4.7)	259 (5.1)	91 (1.8)
6. Sedan/Jeep	3,106	25.3	420 (13.5)	1,028 (33.1)	1,102 (35.5)	243 (7.8)	175 (5.6)	104 (3.3)	34 (1.1)
7. City Bus	1,948	23.7	343 (17.6)	724 (37.2)	616 (31.6)	69 (3.5)	110 (5.6)	71 (3.6)	15 (0.8)
8. Inter-city Bus	475	44.7	42 (8.8)	84 (17.7)	78 (16.4)	20 (4.2)	49 (10.3)	122 (25.7)	80 (16.8)
9. Railway	43	30.1	13 (30.2)	10 (23.3)	7 (16.3)	3 (7.0)	1 (2.3)	4 (9.3)	5 (11.6)
10. Ship/Perry	62	22.6	20 (32.2)	20 (32.2)	10 (16.1)	2 (3.2)	9 (14.5)	0 (0.0)	1 (1.6)
11. Light Truck	85	32.5	14 (16.5)	18 (21.2)	29 (34.1)	2 (2.4)	7 (8.2)	9 (10.6)	6 (7.1)
12. Heavy Truck	179	40.3	9 (5.0)	23 (12.8)	45 (25.1)	3 (1.7)	59 (33.0)	31 (17.3)	9 (5.0)
13. Others	163	27.3	16 (9.8)	59 (36.2)	52 (31.9)	15 (9.2)	8 (4.9)	5 (3.1)	8 (4.9)
Total	45,598	17.4	20,099 (44.1)	14,317 (31.4)	7,571 (16.6)	1,067 (2.3)	1,211 (2.7)	1,003 (2.2)	330 (0.7)

3.1.5 PERSON TRIP O-D MATRIX IN 1982

In 1) of section 3.1.2, a trip rate per person was discussed and estimated at 1.85 trips/person. The population in Surabaya was 2,017,527 in October, 1980 and the average annual growth rate of population during 1971-1980 was calculated to be 2.85%. The population of Surabaya in March, 1982 was therefore estimated to be 2,103,776, in which the population over 6 years of age account for 85.5%. Accordingly, the total person trips made by Surabaya residents in 1982 is estimated at 3,328,000 person trips per day.

In order to obtain the existing person trip O-D matrix, the following steps were taken:

- Estimate vehicle trip O-D table for Surabaya external zones based on the road side O-D survey.
- Using average vehicle occupancy derived from the road-side O-D survey, the above vehicle O-D table is converted to person trip O-D table.
- Screen line traffic volume observed in Surabaya is converted to passenger volume.
- Sample O-D table made from the Home Interview Survey is expanded based on the zonal sampling ratios.
- Check the above O-D table with the screen line crossing volumes and adjust if necessary.
- Incorporate the person trip O-D table in 1) (for the Surabaya external zones), into the above O-D table of Surabaya internal zones.

A flowchart for the process outlined above is shown in Fig. 3.1.6.

As a result, the total person trips generated and attracted in Surabaya was 3,708,588 as shown in Table 3.1.5. Average trip rate, therefore, is estimated at 2.06 trips/person and compared with the previously estimated rate of 1.85 trips/person, 2.06 trips/person seems a little high. However, the screen line traffic includes the trips made by the non-Surabaya residents.

The resulting person trip Block O-D table is summarized in Table 3.1.5; and the screen line traffic and desire lines among the zones in Surabaya and in GKS Region are presented in Fig. 3.1.7 and Fig. 3.1.8 respectively.

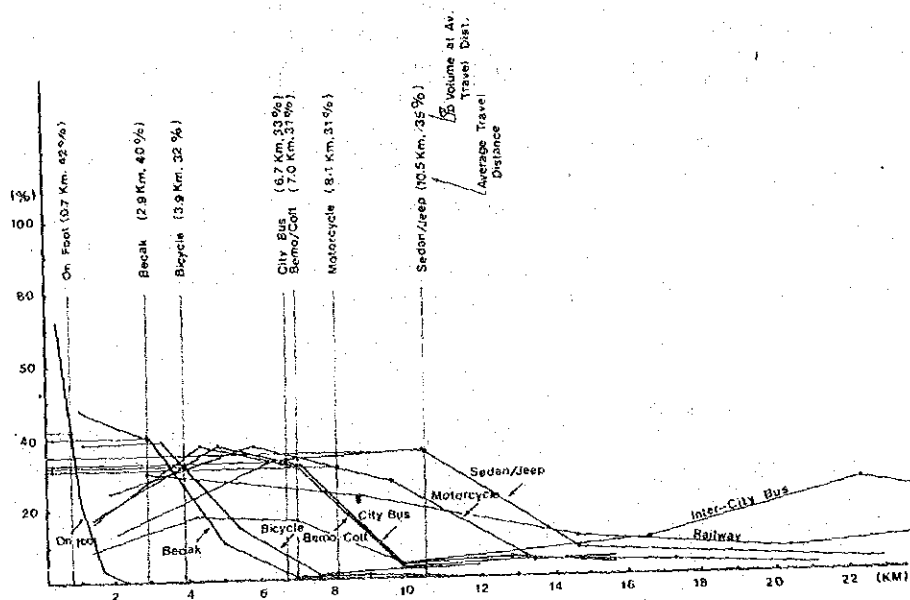


Fig. 3.1.4 DISTRIBUTION OF TRAVEL DISTANCE BY MODE

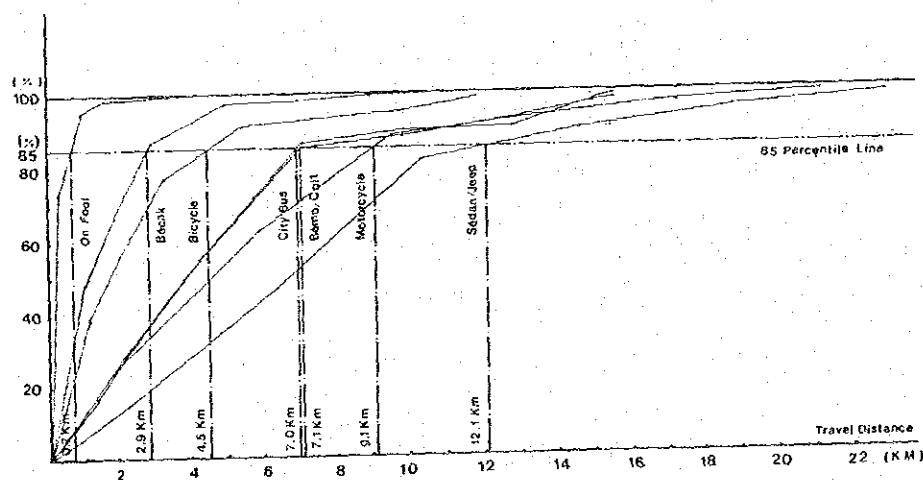
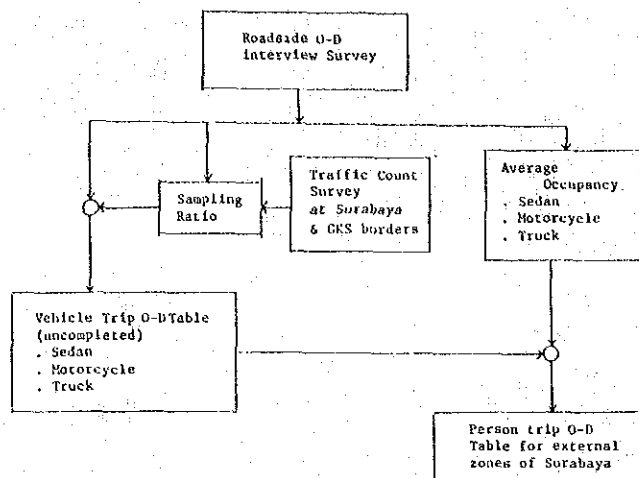


Fig. 3.1.5 INDIVIDUAL TRAVEL DISTANCE BY TRIP MODE EXPRESSED AS ACCUMULATED PERCENTAGE

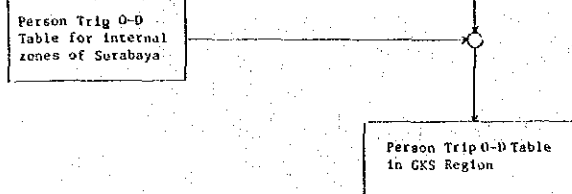
Table 3.1.5 PERSON TRIP BLOCK O-D 1982

TYPE = ALL P.T.					
Name of Block	1. SBY	2. SMA outside SBY	3. GKS outside SMA	4. Outside GKS	5. Total
1. SBY	3,542,236	27,563	17,113	38,500	3,625,412
2. SMA outside SBY	27,563	13,256	8,079	12,054	60,952
3. GKS outside SMA	17,113	8,079	13,947	12,363	51,502
4. Outside GKS	38,500	12,054	12,363	-	65,539
5. Total	3,625,412	60,952	51,502	65,539	3,803,405

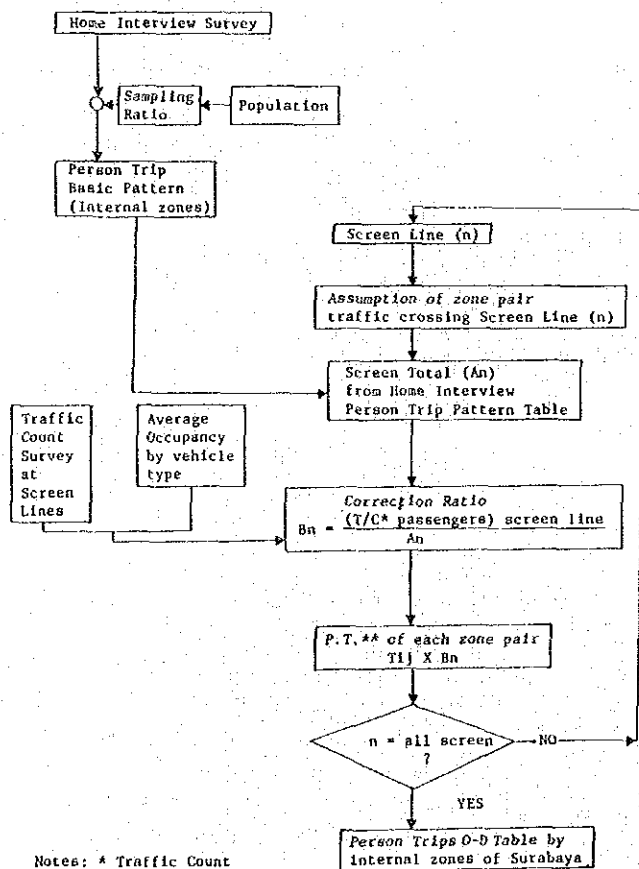
FLOW-I. Person Trip O-D Table
for External zones of Surabaya



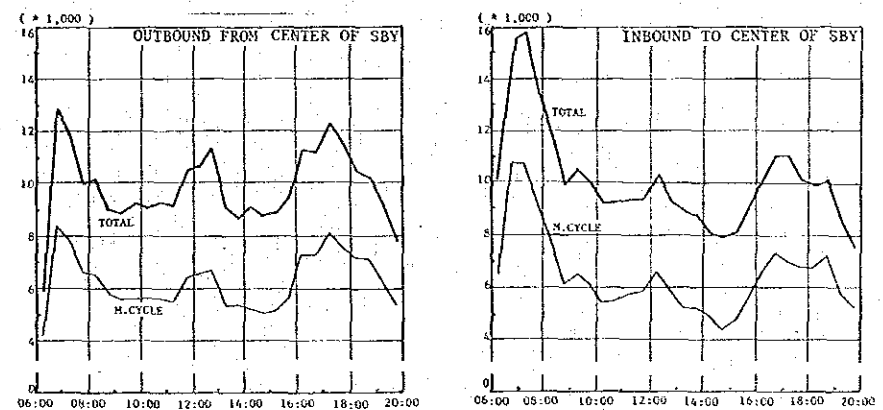
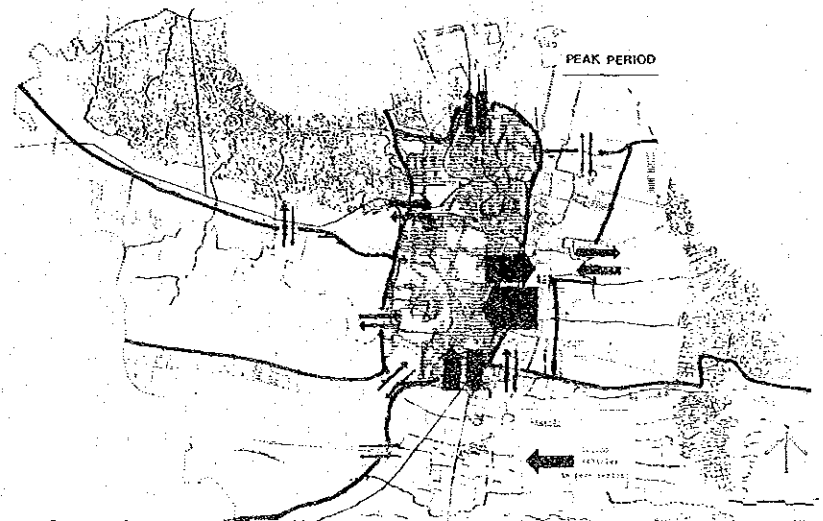
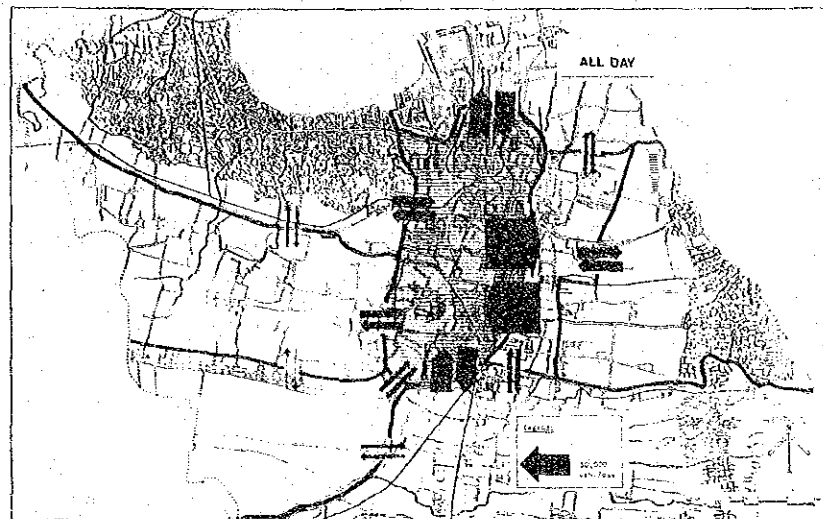
FLOW-II



FLOW-III. Person Trip O-D Table
for Internal zones of Surabaya



Notes: * Traffic Count
** Person Trip



HOURLY FLUCTUATION OF TOTAL
SCREEN LINE TRAFFIC

Fig. 3.1.7 SCREEN LINE TRAFFIC IN SURABAYA 1982

Fig. 3.1.6 FLOWCHART FOR DERIVING PERSON TRIP O-D TABLE

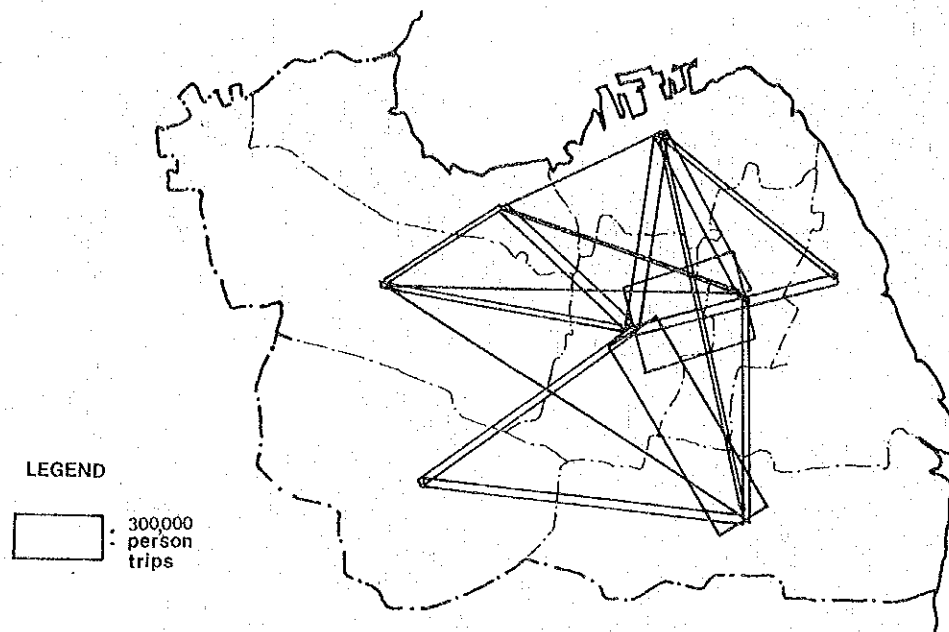


Fig. 3.1.8 (1) DESIRE LINE TRAFFIC IN SURABAYA, 1982

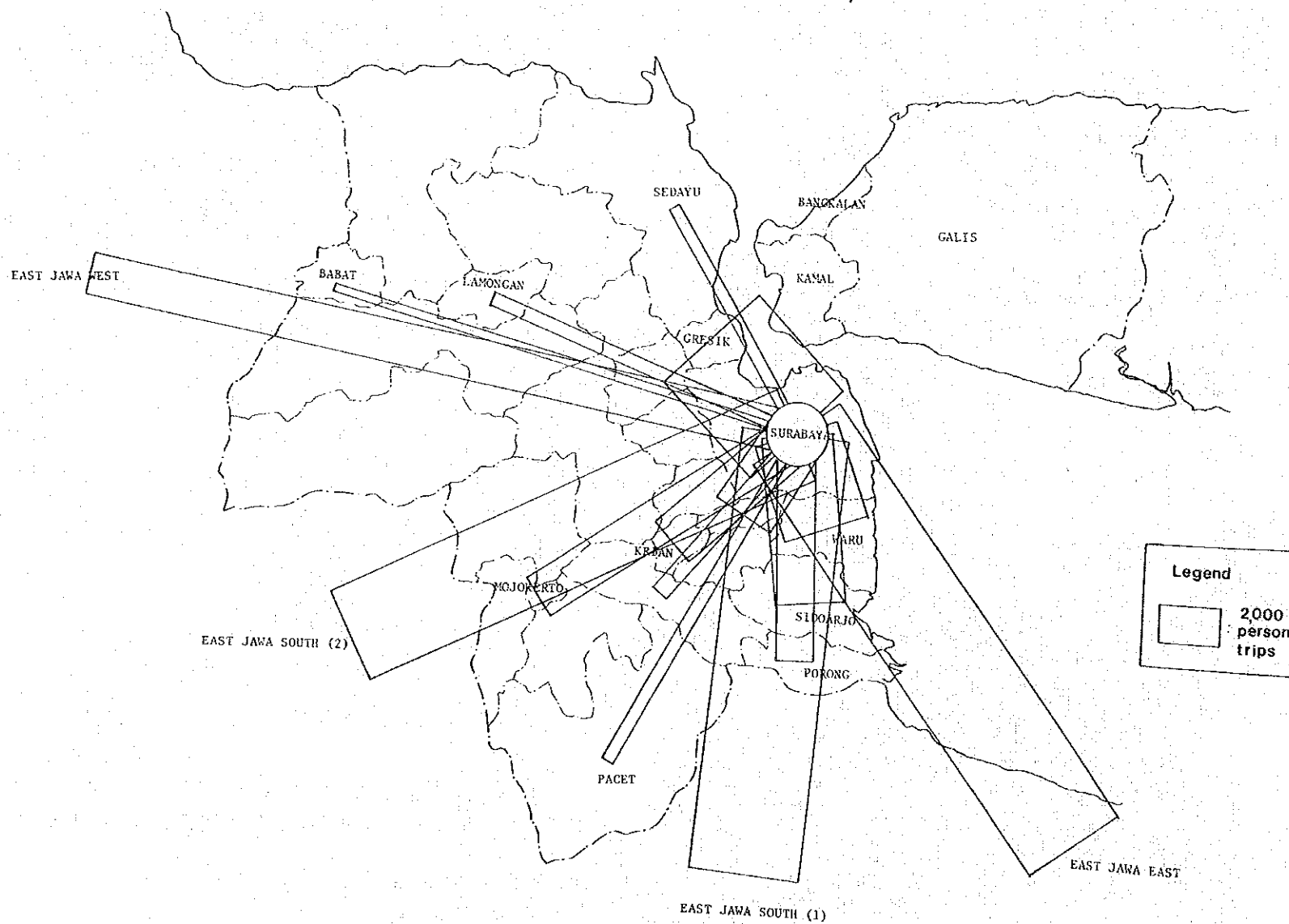


Fig. 3.1.8 (2) DESIRE LINE TRAFFIC IN GKS, 1982

3.2 REGIONAL TRAFFIC MOVEMENT

3.2.1 REGIONAL TRAFFIC O-D AND CHARACTERISTICS

ROADSIDE O-D SURVEY AND VEHICLE O-D MATRIX

The roadside interview O-D survey and traffic count survey were carried out in March, 1982 and survey locations were selected near the border of Surabaya and GKS Region. By this survey, it was intended to understand the regional traffic flows and to prepare a desire line traffic diagram for the evaluation of the present primary road network in GKS Region.

The roadside interview survey was carried out for 24 hours together with a traffic count survey. The survey locations near Surabaya and GKS Region boundaries are:

Surabaya boundary : Tg. Perak Port, Gresik, Taman and Gedangan

GKS Region boundary : Babat, Balongbendo, Porong and Trowulan

The sampled O-D pair traffic collected at each survey station were expanded and adjusted by the following steps:

- The sample O-D pair traffic was expanded based on the traffic count survey results.
- To avoid double counting at the Surabaya and GKS cordon lines, expanded O-D traffic obtained at each survey location were compared and the larger volume was adopted.

As a result of computation, the estimated regional vehicle O-D table is shown in Table 3.2.1.

Table 3.2.1 REGIONAL TRAFFIC FLOWS IN 1982

		SBY	SMA Outside SBY	GKS Outside SMA	Outside GKS	Vehicle Trip End Total
SBY	Truck	-	7,922	3,602	7,011	18,535
	M. Cycle	-	9,819	2,827	1,440	14,086
	Sedan	-	4,096	1,887	3,151	9,134
	I. C. Bus	-	71	140	1,119	1,330
	Colt	-	820	1,173	226	2,219
SMA Outside SBY	Truck	7,922	3,791	1,113	3,749	16,575
	M. Cycle	9,819	6,508	2,346	1,137	19,810
	Sedan	4,096	652	374	1,520	6,642
	I. C. Bus	71	15	30	144	260
	Colt	820	623	899	330	2,672
GKS Outside SMA	Truck	3,602	1,113	1,711	1,903	8,329
	M. Cycle	2,827	2,346	5,147	563	10,883
	Sedan	1,887	374	1,066	1,127	4,454
	I. C. Bus	140	30	64	289	523
	Colt	1,173	899	1,244	459	3,775
Outside GKS	Truck	7,011	3,749	1,903	1,618	14,281
	M. Cycle	1,440	1,137	563	186	3,326
	Sedan	3,151	1,520	1,127	322	6,120
	I. C. Bus	1,119	144	289	-	1,552
	Colt	226	330	459	-	1,015
Vehicle Trip End Total	Truck	18,535	16,575	8,329	14,281	57,720
	M. Cycle	14,086	19,810	10,883	3,326	48,105
	Sedan	9,134	6,642	4,454	6,120	26,350
	I. C. Bus	1,330	260	523	1,552	3,665
	Colt	2,219	2,672	3,775	1,015	9,681

TRIP PURPOSES OF REGIONAL TRAFFIC FLOWS

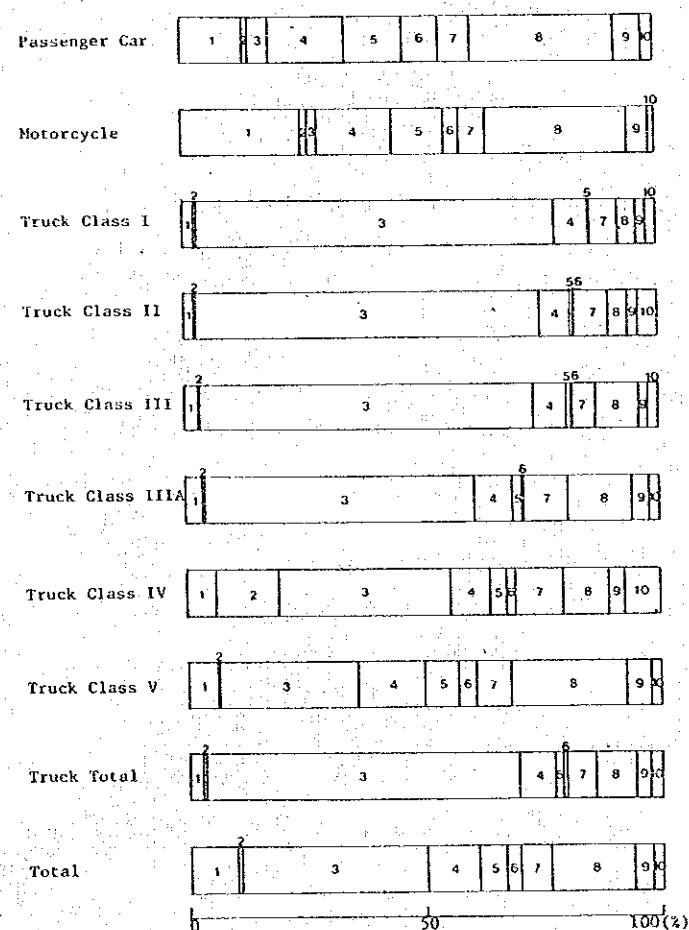
Trip purposes of these regional traffic flows were analyzed from the driver interview.

Major trip purposes for all vehicles, were, "Collecting/Delivering Goods" - 39.2%; "Return to Home" - 17.9%; "As Part of Work" - 11.1%; and "Home to Work" - 10.1%.

For trip purpose of passenger car, the largest share is "Return to Home" - 30.5%; the second is "As Part of Work" - 16.0%; and the third is "Home to Work" - 13.3%.

For motorcycle, "Return to Home" and "Home to Work" both have a large share of the total.

For trucks, "Collecting/Delivering Goods" holds a 60-70% share for truck Class I, II, III and IIIA, but other than this purpose, trucks of Class IV and V are used for "As part of Work", "Home to School", "Home to Work", "Shopping/Private Affairs" and "Return to Home" purposes, in relatively higher proportions compared with other higher classes of truck. The distribution of these trip purposes is summarized in Table 3.2.2 and displayed graphically in Fig. 3.2.1.



Legend: (Trip Purpose)

1. Home to Work
2. Home to School
3. Collecting/Delivering Goods
4. As part of Work
5. Shopping/Private Affairs
6. Soc. Activities Recreation
7. Return to Company
8. Return to Home
9. Others
10. D.K.

Fig. 3.2.1 DISTRIBUTION OF TRIP PURPOSE BY VEHICLE TYPE

Table 3.2.2 DISTRIBUTION OF TRIP PURPOSE BY VEHICLE TYPE

Trip Purpose		1. Home to Work	2. Home to School	3. Collecting/Delivering Goods	4. As Part of Work	5. Shopping Private Affairs	6. Soc. Activities Recreation	7. Return to Company	8. Return to Home	9. Others	10. D.K.	Total
Car Type												
Passenger Car		1,189 (13.3)	93 (1.0)	417 (4.7)	1,429 (16.0)	1,073 (12.0)	698 (7.8)	591 (6.6)	2,728 (30.5)	489 (5.5)	223 (2.5)	8,930 (100.0)
Motorcycle		2,427 (25.6)	136 (1.4)	195 (2.1)	1,459 (15.4)	1,057 (11.2)	293 (3.1)	544 (5.7)	2,832 (29.9)	431 (4.5)	102 (1.1)	9,476 (100.0)
Truck	Class I	110 (2.4)	19 (0.4)	3,507 (75.9)	310 (6.7)	20 (0.4)	2 (0.2)	293 (6.3)	181 (3.9)	91 (2.0)	90 (1.9)	4,623 (100.0)
	Class II	144 (1.8)	44 (0.6)	5,790 (72.7)	528 (6.6)	40 (0.5)	18 (0.2)	579 (7.3)	300 (3.8)	197 (2.5)	321 (4.0)	7,961 (100.0)
	Class III	209 (2.9)	28 (0.4)	5,151 (70.5)	486 (6.7)	23 (1.1)	11 (0.2)	364 (5.0)	672 (9.2)	147 (2.0)	155 (2.1)	7,306 (100.0)
	Class IIIA	44 (3.3)	10 (0.7)	769 (57.0)	106 (7.9)	28 (2.1)	6 (0.4)	132 (9.8)	185 (13.6)	42 (3.1)	28 (2.1)	1,348 (100.0)
	Class IV	9 (6.1)	20 (13.6)	53 (36.1)	12 (8.2)	5 (3.4)	3 (2.0)	15 (10.2)	14 (9.5)	5 (3.4)	11 (7.5)	147 (100.0)
	Class V	175 (6.2)	10 (0.4)	826 (29.3)	400 (14.2)	206 (7.3)	101 (3.6)	202 (7.2)	696 (24.8)	140 (5.0)	62 (2.2)	2,820 (100.0)
	Sub Total	691 (2.9)	131 (0.5)	16,096 (66.5)	1,842 (7.6)	382 (1.6)	141 (0.6)	1,585 (6.5)	2,048 (8.5)	622 (2.6)	667 (2.8)	24,205 (100.0)
	Total	4,307 (10.1)	360 (0.8)	16,708 (39.2)	4,730 (11.1)	2,512 (5.9)	1,132 (2.7)	2,720 (6.4)	7,608 (17.9)	1,542 (3.6)	992 (2.3)	42,611 (100.0)

3.2.2 CARGO MOVEMENTS

CARGO MOVEMENTS IN EAST JAVA AND JAVA ISLAND

(1) Based on the 1977 Cargo (ton) survey conducted by Bina Marga, major cargo movements are found in 4 directions, and as shown in Fig. 3.2.2, these are:

- Surabaya – Jakarta Direction → West bound
- Surabaya – Madiun Direction → West bound
- Surabaya – Malang Direction → South bound
- Surabaya – Banyuwangi Direction → South east bound

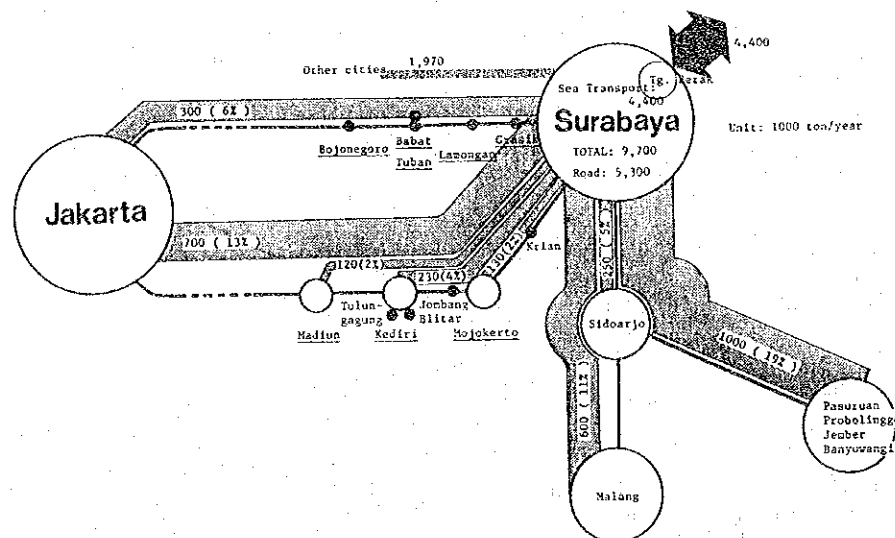


Fig. 3.2.2 INTER REGIONAL TRAFFIC AXES FROM SURABAYA

(2) Surabaya – Jakarta direction has two routes: one is via Mojokerto, the other is via Gresik.

According to the traffic count survey data, it is presumed that 20–30% of the total Surabaya – Jakarta traffic passes through Gresik and the remaining 70–80% passes through Mojokerto. Other main routes radiating from Surabaya are:

Surabaya – Sidoarjo – Malang route, and
Surabaya – Sidoarjo – Pasuruan – Probolinggo – Jember – Banyuwangi

Therefore, Sidoarjo is not only the area of traffic generation but also the area of traffic Divergence for Malang and Pasuruan.

(3) The westbound traffic has a northern route (via Gresik) and a southern route (via Mojokerto). The southern route is much more connected with local core cities than the northern route.

This will mean that the southern route involves long distance trips and also many medium and short distance trips. Therefore, it is conceivable that the cities through which the existing southern route passes will suffer from the congestion of mixed intra-city and inter-city traffic in the near future.

The northern route is less burdened with traffic and connects with fewer local core cities than the southern route. This route seems to contribute to long distance trips with Surabaya and this gives an impact on the development of those cities along the route.

(4) Major cargo origin and destination cities are Jakarta, Madiun, Kediri and Mojokerto for westbound traffic; Sidoarjo and Malang for southbound traffic; and Pasuruan, Probolinggo, Jember and Banyuwangi for eastbound traffic. These 3 directions account for 27%, 16% and 19% respectively of the total road traffic generated and attracted in Surabaya in 1977.

CARGO TRAFFIC THROUGH WEIGHT-BRIDGES IN GKS REGION

Inbound cargo flows to Surabaya pass through weight-bridges with Trossbo and Candi II being used by the majority of traffic.

Outbound cargo flows from Surabaya also pass through the opposite side of these weigh-bridges as seen in Fig. 3.2.3. Total inbound and outbound traffic to and from

GKS Region amounted to 5.4 million tons (898,000 trucks) and 5.0 million tons (911,000 trucks) respectively in 1980.

However, it is noticed from Table 3.2.3 that cargo flows are remarkably out of balance between Surabaya City and GKS Region outside Surabaya. For example the lack of balance between the inbound traffic observed at Trosobo and Trowulan and the outbound traffic observed at Taman and Trowulan.

Thus, GKS Region outside Surabaya is a principal area of cargo traffic generation for Surabaya. This is particularly true for Kab. Mojokerto according to the survey results conducted at the weigh-bridges.

For the cargo traffic growth at Lamongan during 1974 to 1980, the growth rate of outbound traffic is higher than that of inbound traffic in contrast with the results derived from Taman and Candi. Nevertheless, compared with the data during 1978 to 1980, it is known that current traffic growth is much higher for the inbound traffic and this shows similar characteristics to Taman and Candi.

Cargo traffic observed at Socah shows an absolute contrast with other weigh-bridges. At Socah the outbound traffic from Surabaya always exceeds the inbound traffic to Surabaya. In addition, the current trend of cargo traffic development is comparatively lower than that of other areas and the inbound traffic showed a negative growth during 1978 to 1980.

The data obtained at each weigh-bridge is graphically compared with other weigh-bridges and by each direction of cargo flows in Fig. 3.2.4.

Interview surveys were carried out at weigh bridges in GKS Region in February, 1982. Based on these surveys distribution of cargo (ton) traffic through the weigh-bridges are presented in Fig. 3.2.5 (1) & (2).

According to the figure, it is found that cargo traffic to and from GKS Region are generated and attracted in Surabaya and Mojokerto followed by Sidoarjo.

The cargo flows to and from Surabaya, which passed the weigh bridges surveyed, mostly concentrated in the port area and its immediate hinterland. This area is a center of business and trade, and cargo related facilities are densely accumulated without sufficient road space for through traffic and car parking.

Another feature of weigh-bridge traffic to and from Surabaya is that the cargo is distributed in a north-south direction along the truck routes in Surabaya.

COMMODITY FLOWS

Truck drivers interviewed at the weigh-bridges gave information about their cargoes. The composition cargoes at each weigh-bridge are presented in Fig. 3.2.6 together with the composition diagrams derived from the similar survey at the Tg. Perak Port Area and Sidotopo Truck Terminal.

Agricultural/Forest products are handled at every facility, and inbound traffic of agricultural products to Surabaya from Candi II and Trowulan account for the major throughput traffic.

Chemical products are handled at Sidotopo truck terminal for both inbound and outbound directions, in more or less the same volume. Likewise, other commodities are also more or less equally handled. Sidotopo Terminal is provided with warehouses but most of the cargoes handled at the terminal will be major commodities as agricultural/forest products, chemical products and products of medium/small industry. These three major commodities are closely related to the port activities. Chemical products throughput at weigh-bridges seem to be distributed from Sidotopo Terminal or the Port.

At Trosobo and Candi II weigh bridges, principal inbound flow consists of building materials. Products of medium and small industry are distributed relatively equally to each weigh-bridge and to both inbound and outbound flows. An increase of small unit cargo traffic, which is mostly produced by medium/small manufacturing industries, is

suitable for a truck terminal system other than the existing Sidotopo Truck Terminal which now provides only parking, loading/unloading and warehouse services. In addition, a movement to containerization of ship cargoes will also require a terminal function.

In order to cope with these movements a cargo transport system should be planned in the Study.

Table 3.2.3 CARGO FLOWS THROUGH WEIGH-BRIDGES IN GKS REGION 1980

Location No.	Weigh Bridge	Goods (x1000ton)			Vehicles (x1000veh.)			Average Load (ton/Veh.)		
		Out	In	Total	Out	In	Total	Out	In	Total
1.	Taman	1,425 (11.3)	-	1,425	258	-	258	5.51	-	5.51
1.	Trosobo	-	4,253 (24.3)	4,253	-	609	609	-	6.98	6.98
2.	Candi I	2,028 (14.6)	-	2,028	402	-	402	5.04	-	5.04
2.	Candi II	-	3,415 (17.8)	3,415	-	574	574	-	5.94	5.94
3.	Trowulan	1,657 (-)	1,116 (-)	2,773	299	184	483	5.54	6.06	5.74
13.	Lamongan	1,033 (26.4)	821 (24.2)	1,854	139	133	252	7.41	7.26	7.34
14.	Socah	242 (35.8)	83 (15.5)	326	69	26*	95	3.50	3.20	3.41
GKS Total		6,387 (16.0)	9,689 (21.3)	16,077	1,169	1,507	2,677	5.46	6.43	6.01
East Java		11,308 (14.6)	14,306 (18.6)	25,615	2,207 (10.8)	2,466 (12.3)	4,673	5.12	5.80	5.48

Note : * Data in May and July, 1980 are extremely different from the average load and are thought to be incorrect. The data was therefore revised to bring it closer to the average load.
 Figures in parenthesis () indicate annual average growth rate (%) from 1974 to 1980.

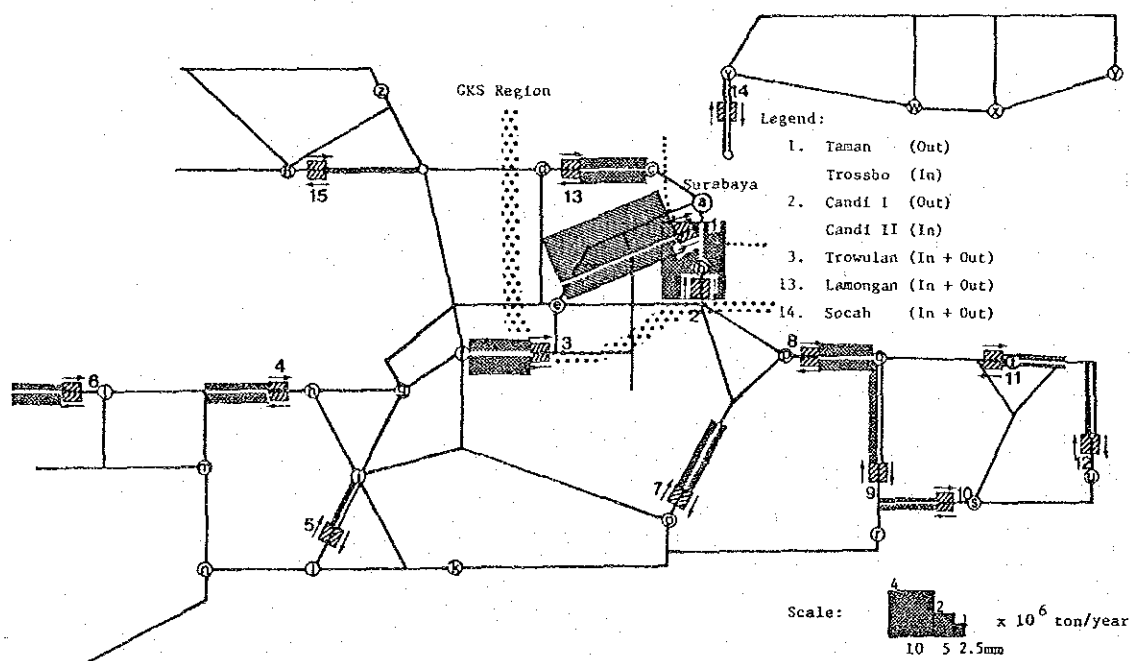


Fig. 3.2.3 CARGO MOVEMENTS IN EAST JAVA

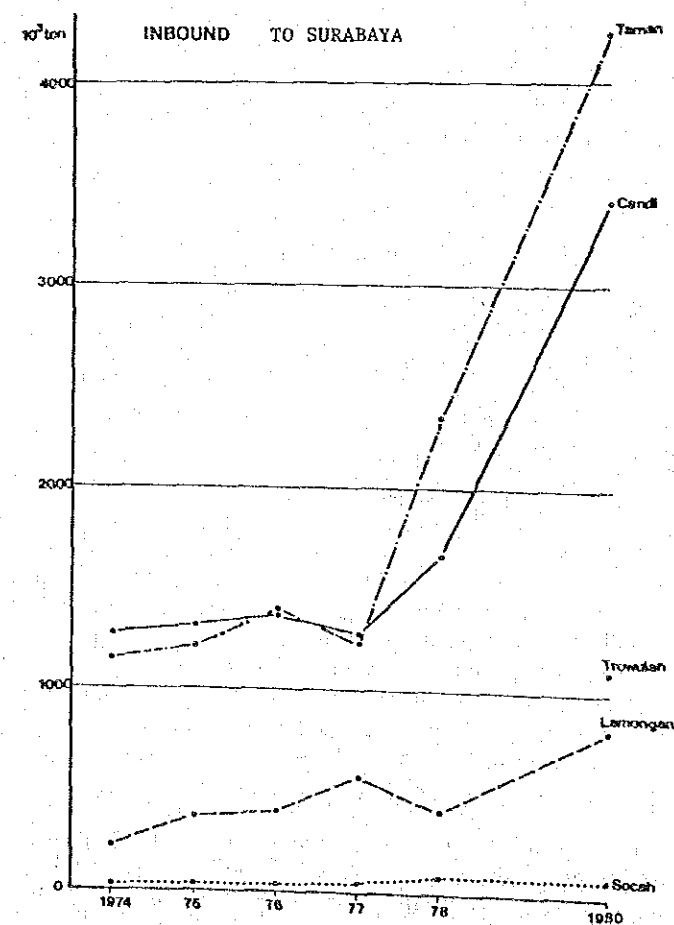
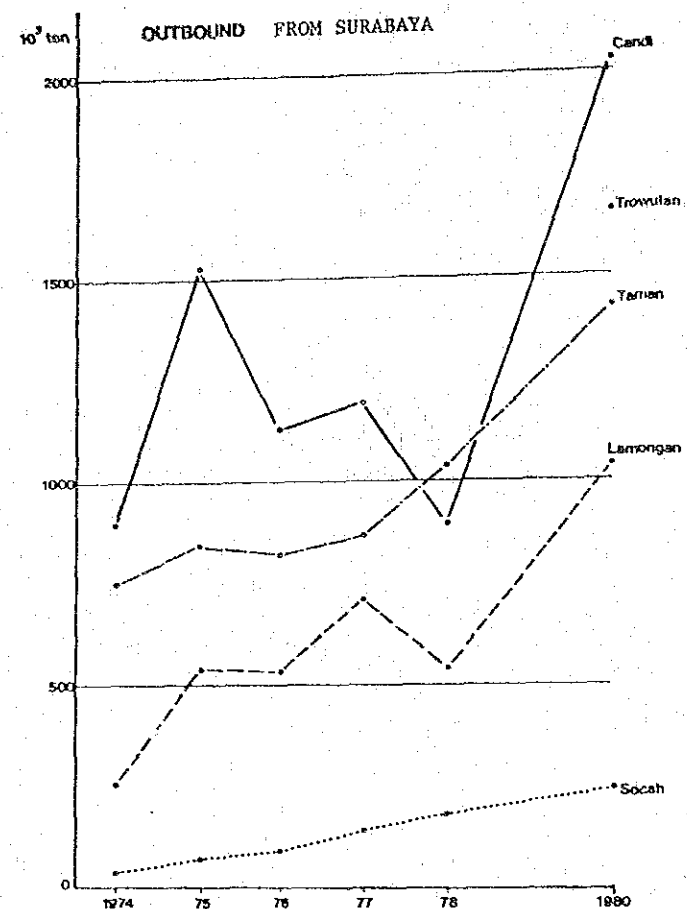


Fig. 3.2.4 GROWTH OF CARGO FLOWS IN GKS REGION

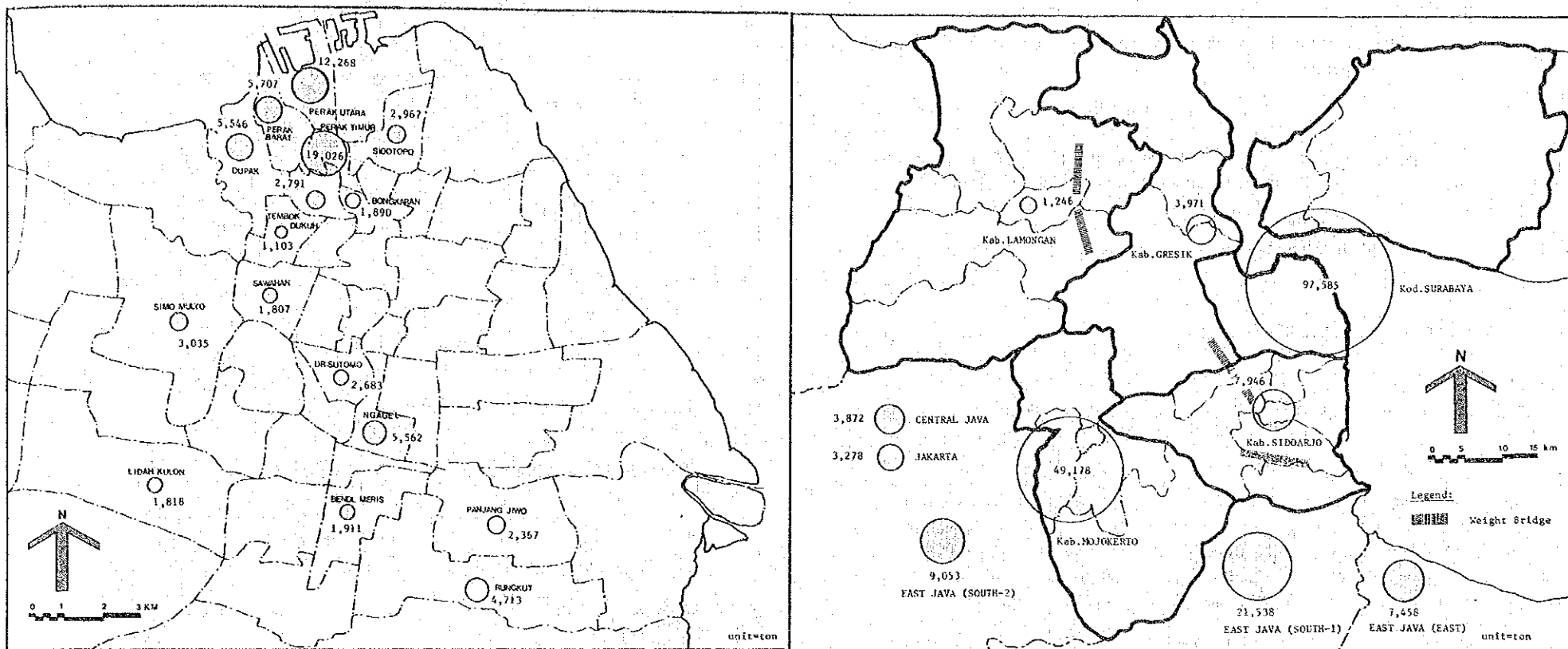


Fig. 3.2.5 REGIONAL COARGE MOVEMENT THROUGH WEIGH-BRIDGES (1) AND (2)

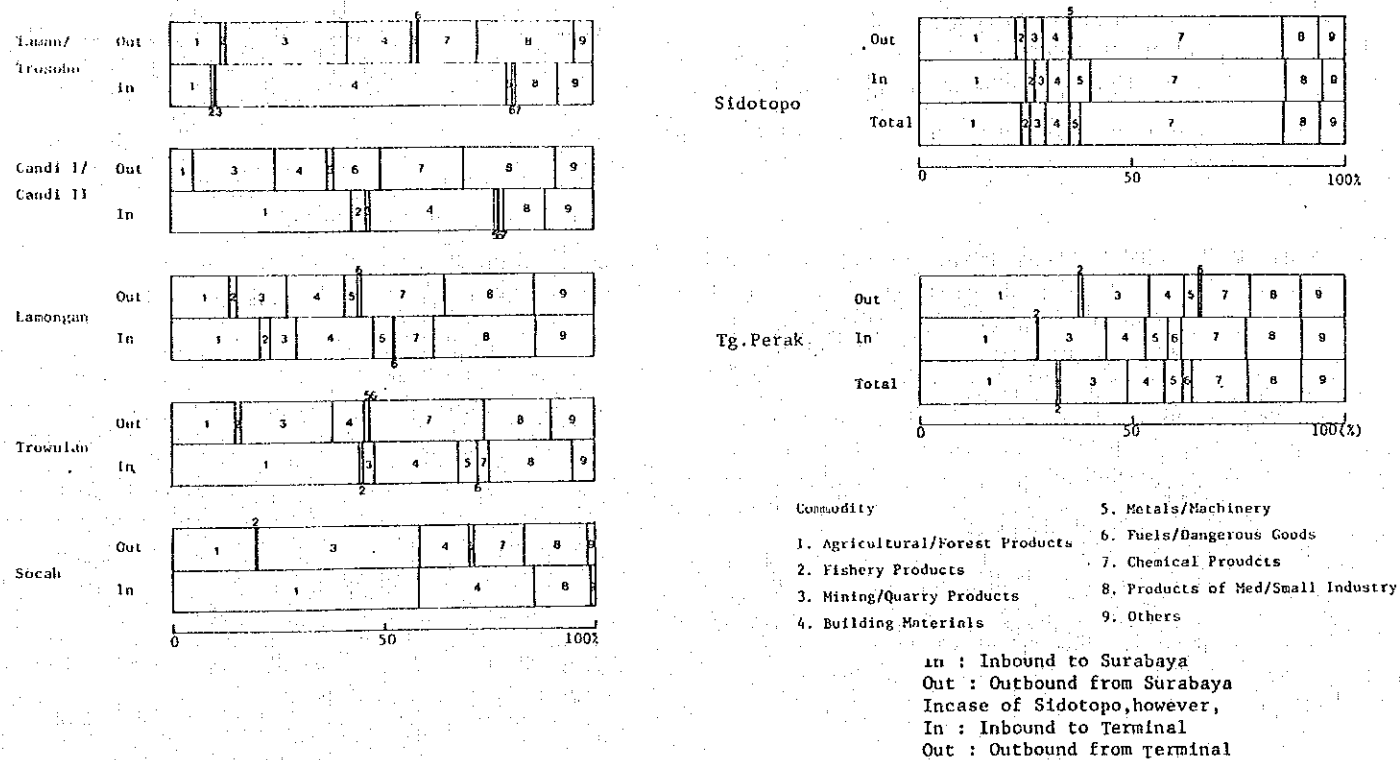


Fig. 3.2.6 COMPOSITION OF COMMODITIES AT WEIGH-BRIDGES

AVERAGE TRUCK LOAD

In GKS Region, a truck load averages 5.48 ton/veh. and 6.41 ton/veh. for outbound and inbound traffic respectively.

The average truck load observed at Lamongan weigh-bridge was 7.26 ton/veh. and 7.41 ton/veh., for inbound and outbound traffic respectively, and these are the highest weights for all weigh-bridges. The average loads at Socah weigh-bridge are 2.81 ton/veh. and 3.69 ton/veh. for inbound and outbound traffic respectively and these are the lowest in GKS Region.

The average truck load in GKS Region has been increasing, particularly for inbound traffic.

3.2.3 INTER-CITY BUS AND COLT

PERMITTED NUMBER OF BUSES AND COLTS FOR REGIONAL TRANSPORT

Surabaya is a center of regional and inter-regional public transport. Inter-city bus and colt are serving long distance travel as far as Jakarta and for medium distance travel to Malay, Mojokerto and Babat, respectively.

The number of colts permitted to operate in the routes of East Java is presented in Table 3.2.4. According to this Table it is found that south bound traffic between Surabaya and Malang, Surabaya-Gempol section in particular, shows the highest demand for colt transport, followed equally by southwest bound traffic between Surabaya and Mojokerto, and west bound traffic between Surabaya and Babat.

Inter-City bus routes from Surabaya have six destinations with a frequent service schedule as shown in Fig. 3.2.7. Although the actual operation of the buses does not fully realize the schedule, regional and inter-regional transport depend very much on the inter-city buses, and amounts to 23,000 passengers departing from Joyoboyo and 5,000 from Jembatan Merah Terminal in Surabaya, each day in 1982.

PASSENGERS' O-D FOR INTER-CITY AND COLT TRANSPORT

The passenger O-D survey was carried out by the Team at major bus and colt terminals in GKS Region, which are Joyoboyo, Jembatan Merah, Pasan Turi and Wonokromo in Surabaya, Gresik, Krian, Mojokerto, Lamongan, Babat, Sidoarjo and Bangkalan.

Based in the survey results and the data obtained at the terminals, passenger O-D tables were prepared for the passengers of inter-city bus and colt as summarized in Table 3.2.5 and 3.2.6 respectively.

Table 3.2.4 COLT OPERATION TO AND FROM SURABAYA

Year	(Unit : No. of Colts)			
	South Bound		Southwest Bound	West Bound
	SBY-Malang	SBY-Gempol	SBY-Mojokerto	SBY-Babat
1976	611	492	436	322
1977	518	324	368	284
1978	585	299	394	321
1979	637	610	426	450
1980	623	976	450	465

SOURCE : LAPORAN-TAHUNAN, Tahun 1980, DLLAJR, Propinsi Daerah Tingkat I, Jawa Timur.

Table 3.2.5 PASSENGER O-D MATRIX FOR INTER-CITY BUS IN 1982

(UNIT : Pass./day)					
	Surabaya	SMA outside Surabaya	GKS Outside SMA	Outside GKS	Total
Surabaya		1,486	2,923	23,327	27,736
SMA outside Surabaya	1,486	313	621	3,001	5,421
GKS Outside SMA	2,923	621	1,330	6,034	10,908
Outside GKS	23,327	3,001	6,034	-	32,362
Total	27,736	5,421	10,908	32,362	76,427

Table 3.2.6 PASSENGER O-D MATRIX FOR COLT IN 1982

(Person Trips/day)					
	Surabaya	SMA outside Surabaya	GKS outside SMA	Outside GKS	Total
Surabaya		3,567	5,102	985	9,654
SMA outside Surabaya	3,567	2,712	3,912	1,435	11,624
GKS outside SMA	5,102	3,912	5,412	1,997	16,423
Outside GKS	985	1,433	1,997	-	4,415
Total	9,654	11,624	16,423	4,415	42,116

Inter-Regional Transport

A: From Jakarta, West Java, Central Java
To East Java via Tuban:
42 Buses, 52 Trips

From East Java
To Jakarta, West Java, Central Java:
36 Buses, 38 Trips

B From Jakarta, Central Java, Jogjakarta
To East Java via Madiun:
82 Buses, 98 Trips

From East Java
To Jakarta, Central Java, Jogjakarta:
236 Buses, 377 Trips

C: From Central Java
To East Java via Pacitan/Ponorogo:
33 Buses, 66 Trips

D: From Bali
To East Java:
53 Buses, 55 Trips

From East Java
To Bali:
36 Buses, 36 Trips

Regional Transport between Surabaya and East Java

a : Lamongan-Babat and Tuban-cepu Directions
4-5 minutes interval
189 Buses, 530 Trips

b : Kertosono-Madiun, etc. Directions
1-2 minutes interval
314 Buses, 571 Trips

c : Kertosono-Kediri-Tulungagung Directions
2-3 minutes interval
223 Buses, ryw Trips

d : Malang-Blitar Directions
1-2 minutes interval
194 Buses, 588 Trips

e : Pasuruan-Probolinggo Directions
3-5 minutes interval
230 Buses, 393 Trips

f : Madura Directions
10-15 minutes interval
77 Buses, 82 Trips
(Local 1 Bus, 2 Trips)

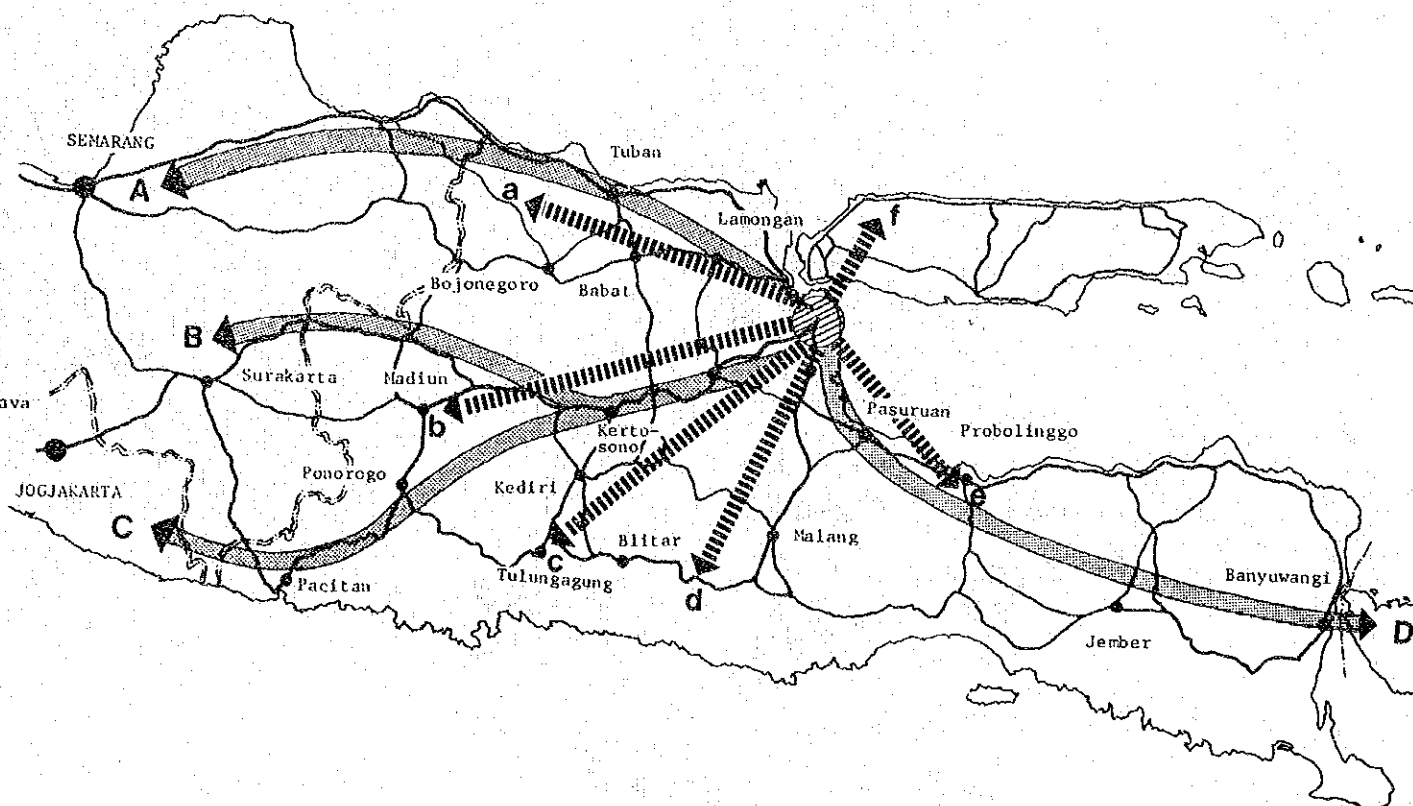


Fig. 3.2.7 SCHEDULED INTER-CITY BUS OPERATION BY ROUTE IN 1980

3.2.4 DESIRE LINE TRAFFIC AND ROAD NETWORK IN GKS REGION

Based on the vehicle O-D Table derived from the roadside O-D survey, desire lines for sedan/Jeep, motorcycles, and trucks, were prepared as presented in Fig. 3.2.8 (1 to 4).

Major traffic generating zones in GKS outside Surabaya are Gresik, Krian, Mojokerto, Sidoarjo, Waru and Bangkalan. Motorcycle and passenger cars mostly connect with Surabaya, and other O-D pair traffic is only found along the major corridors of Surabaya--Porong, Surabaya--Mojokerto, Surabaya--Gresik--Babat.

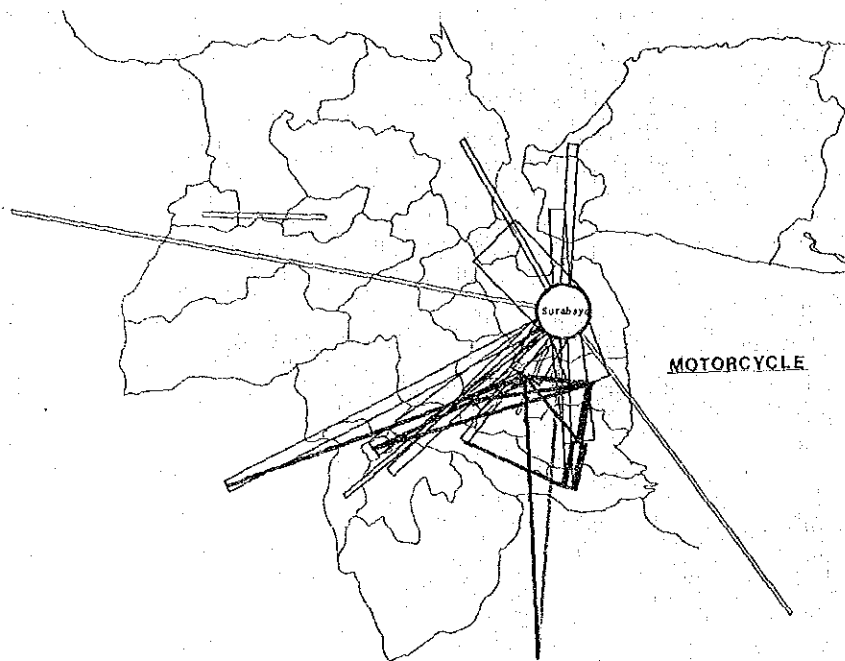
For trucks, however, a different pattern of traffic flows is derived. The desire line traffic between Gresik and Mojokerto; Cerme and Malang; and Taman and Malang are major traffic flows, and that between Sidoarjo and Gresik is presently a minor traffic flow. Similarly, a minor flow between Gresik and Bangkalan is also observed in the desire line diagram.

Another feature of the truck flows in GKS Region is that extremely long distance trips such as Surabaya--Jakarta are compatible in volume with medium distance trip such as Surabaya--Krian, Surabaya--Waru, and Surabaya--Porong.

Surabaya is a nodal point for radial traffic to all of Java Island and Madura. In this sense, the western side of Surabaya has a larger coverage of potential traffic generation than the eastern side. There are two corridors extending to the west from Surabaya. One is via Gresik, Babat and Semarang, and the other is via Mojokerto, Jombang, Surakarta. The former route should be prepared to connect Metropolitan regions such as Jakarta, Cirebon, Semarang and Surabaya directly with a highway of high standard design, if traffic demand is to be satisfied. The latter should be prepared to connect regional urban centres and to serve mainly for interregional trips. By-passes are required to prevent traffic bottlenecks in the urban centres.

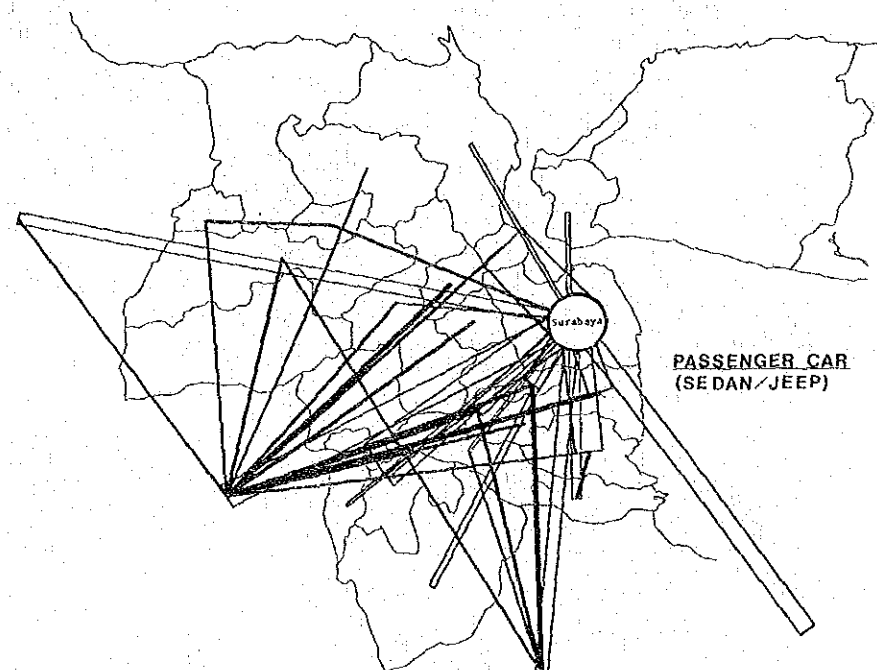
For GKS Region, some ring roads should be designated to expedite the traffic flows between regional urban centres such as Mojokerto, Sidoarjo, Gresik, Krian, Waru and Porong; and also to eliminate through traffic in Surabaya.

1



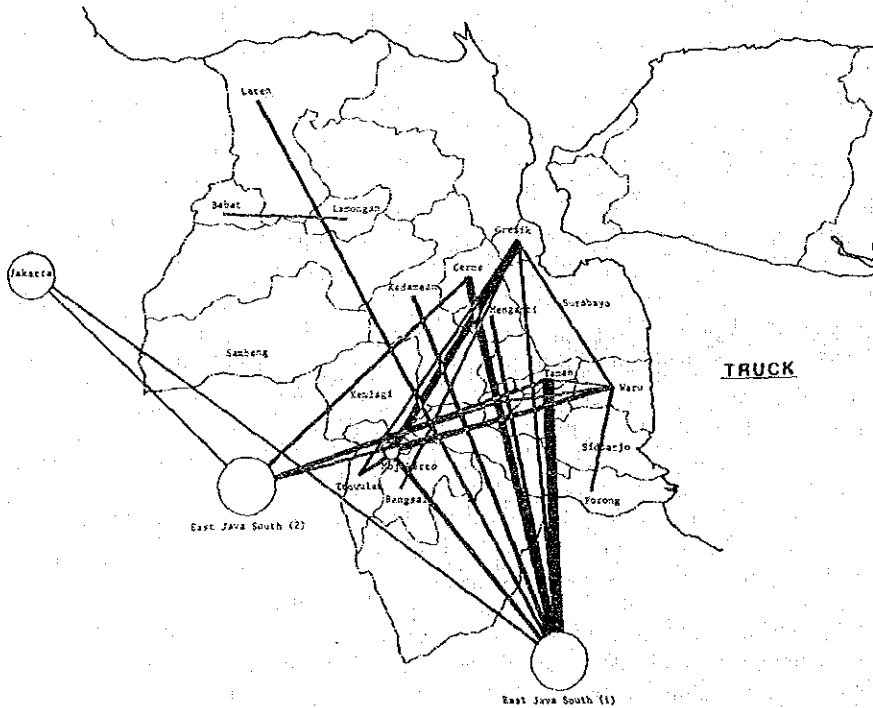
DESIRE LINE OF MOTORCYCLES IN 1982

2



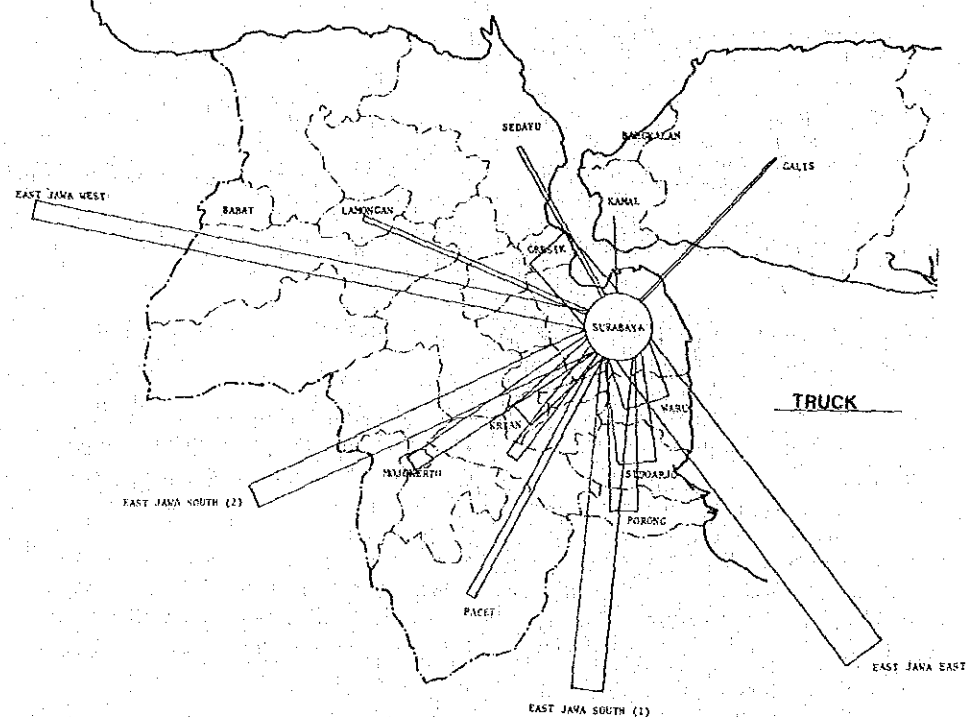
DESIRE LINE OF PASSENGER CARS IN 1982

3



DESIRE LINE OF TRUCKS RELATED TO OUTSIDE SURABAYA IN 1982

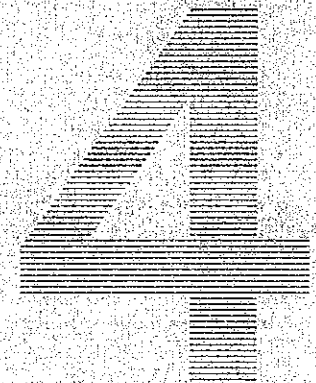
4



DESIRE LINE OF TRUCKS RELATED TO SURABAYA IN 1982

Fig. 3.2.8 DESIRE LINE TRAFFIC IN GKS REGION, 1982 (1 to 4)

CHAPTER



EXISTING PLANS AND PROJECTS

4.1 NATIONAL AND REGIONAL DEVELOPMENT PLAN

4.1.1 NATIONAL DEVELOPMENT CONCEPT

In this section the relevant development policies and concepts for GKS Region prepared by other agencies prior to the study, are summarized for review and reference.

BASIC CONCEPT

The most important influence over the past growth and present level of development of Indonesia as an independent nation, is the Pancasila (The Five Principles of the Republic of Indonesia).

These form the philosophical and psychological keystone which holds all national development efforts together and pulls the variety of programmes and policies into a single structure of concord and unity.

PELITA III

It is widely recognized that the PELITA-I (the first national development five year plan) in April, 1969 gave the directions for the national development efforts and this was followed by PELITA II and PELITA-III.

The basic philosophy of the national 5 year programmes are as follows:

- Pelita I : Development of the industrial sector to support agriculture. (1969/70 – '73/74)
- Pelita II : Development of the agricultural sector and promotion of industries processing raw material so as to produce basic materials. (1974/75 – '78/79)
- Pelita III : Development of the agricultural sector and promotion of industries processing these basic materials to produce finished goods. (1979/80 – '83/84)

It is considered that by promoting development in the agricultural and industrial sectors in stages, a balanced structure in the national economy will be achieved.

In order to achieve the multiple objectives Pelita III has the following Socio-Economic Framework as the target of National development:

(1) Population

Population in Indonesia during PELITA III is forecast as shown in Table 4.1.1.

Table 4.1.1 POPULATION FRAMEWORK IN PELITA III

Region	Area (1,000 km ²)	Population (million person)		Population Density (person/km ²)	
		1978	1983	1978	1983
Java	135	87	95	644	704
Others	1,892	50	56	26	30
Indonesia	2,027	137	151	68	75

(2) National Product

This Plan aims at a National Product growth rate of 6.5%. The growth rate by sectors is as shown in Table 4.1.2.

(3) Investment

Annual economic growth rate of 6.5% is supported by the total investment growth of 9.7% p.a. The ratio of total investment to GDP is expected to rise from 21.2% in 1978/1979 to 24.6% in 1983/1984.

79% of these investments are to come from the domestic sources, and the remainder from external sources.

Table 4.1.2 COMPOSITION OF NATIONAL PRODUCT BY SECTOR

Sector	1978/1979 (Forecast)	Growth Rate (Average during PELITA III)	1983/84 (Forecast)
Agriculture	31.4%	(3.5%)	27.2%
Mining	17.9%	(4.0%)	15.9%
Manufacturing	10.2%	(11.0%)	12.6%
Construction	4.9%	(9.0%)	5.5%
Transport &			
Communication	4.6%	(10.0%)	5.4%
Others	31.0%	(8.1%)	33.4%
National Product	100.0%	(6.5%)	100.0%

Table 4.1.3 NATIONAL PRODUCT AND INVESTMENT
(billion Rp. by Nominal Price)

	78/79	79/80	80/81	81/82	82/83	83/84	PELITA III
GDP (A)	23,165	26,920	30,675	34,955	39,835	45,390	
Investment (B)	4,915	6,195	7,345	8,450	9,700	11,145	42,835
Development							
Budget	2,455	3,488	3,892	4,350	4,778	5,341	21,849
Others	2,460	2,707	3,453	4,100	4,922	5,804	20,986
B/A	21.2%	23.0%	23.9%	24.2%	24.4%	24.6%	

4.1.2 REGIONAL DEVELOPMENT POLICY

REGIONAL DEVELOPMENT IN THE NATIONAL VIEW

In the national scale, BAPPENAS has decided on four regions of main development taking note of port functions and their hinterland as follows (Refer to Fig. 4.1.1.):

A Region

The main centre is Medan and the region includes the following:

- Aceh and North Sumatra
- West Sumatra and Riau

B Region

The main centre is Jakarta and the region includes the following:

- Jambi, South Sumatra and Bengkulu
- Lampung, the isle of Belitung, DKI Jakarta, West Java, Central Java and Jogjakarta
- West Kalimantan and the Natuna islands

C Region

The main centre is Surabaya and the region includes the following:

- East Java and Bali
- East Kalimantan, South Kalimantan and Central Kalimantan

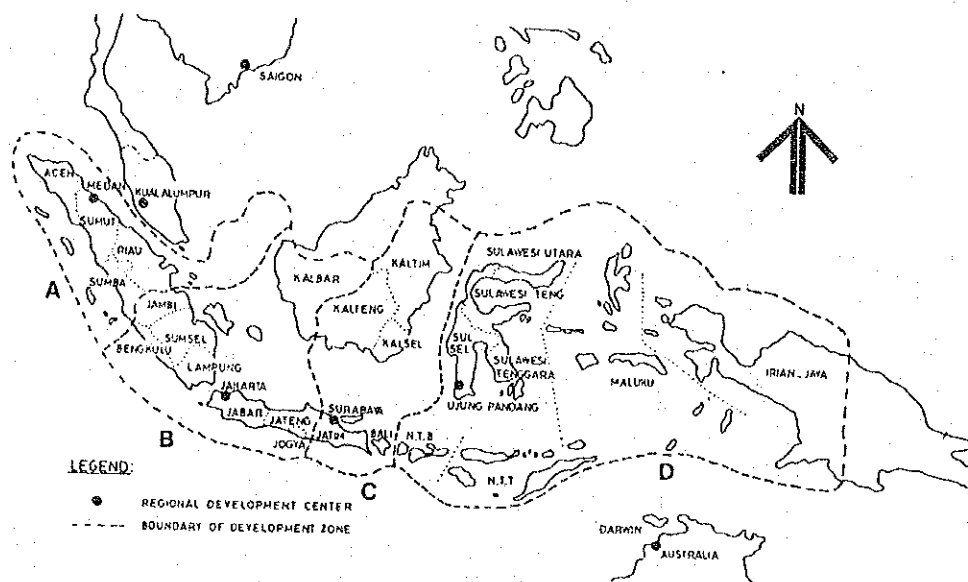


Fig. 4.1.1 REGIONAL DEVELOPMENT ZONES AND CENTRES IN INDONESIA

D Region

The main centre is Ujung Pandang and the region includes the following:

- West Nusa Tenggara, East Nusa Tenggara, South Sulawesi, and Southeast Sulawesi
- Central Sulawesi, North Sulawesi and North Moluccas
- Irian Jaya and the islands of the South Moluccas

With the existence of regions for main development with main centres, there has been a division at the National level in the sense of geography and administration, and simultaneously a uniting of development activity according to the regional potential.

PELITA III IN EAST JAVA BY BAPPEDA

In the implementation of Projects, there are six priority programmes and three supporting programmes.

For each sector and subsector, programmes and projects have been determined as follows: (Refer to Fig. 4.1.2)

(1) The Development Strategy in East Java Province

To reach the main objective, it is necessary to decide development strategies.

As the development strategy based on PELITA III, East Java is divided into Five Regions of Development (Growth Poles) as follows:

- The region of development which borders on the city of Surabaya with its centre in Surabaya City. This area has been prepared for industrial activity development, and consolidation of business, maritime activities and services (GERBANGKERTOSUSILA REGION OF DEVELOPMENT).
- The region of development of the central upland with its centre in the city of Malang. Development should emphasize the improvement of production of agriculture and plantations, and industrial activity for the processing of the agricultural/plantation products.
- The region of development of the low land at the Eastern side with its centre in the city of Jember. Development should emphasize the irrigation intensification efforts to increase the food production and export production, while the city of Banyuwangi can become the industrial centre and maritime harbour for this Eastern area.

- The region of development of the low land at the West Side with the city of Madiun as its center. This area has been prepared for the development of material mining activities and production of forest produce.
- The region of development of Madura with its centre of development in the city of Sumenep. This area has been prepared as a husbandry area, fishery and salt manufacturing.

These centres of development are complemented by three Sub-regions as follows:

Sub-region I having the chance for major development, covers the area of North Blitar, Jombang, Mojokerto, Sidoarjo, Pasuruan, North Malang, Probolinggo, Lumajang, Jember, Bondowoso, Banyuwangi, Magetan, Ngawi, Madiun and Nganjuk and Surabaya.

Sub-region II having the chance to develop in a moderate way, covers the area of Bojonegoro, Bangkalan, Sampang, Pamekasan, Sumenep, Gresik and Situbondo.

Sub-region III having the chance to develop in a restricted way, covers the area of Ponorogo, Pacitan, Trenggalek, South Tulungagung, South Blitar and South Malang.

(2) Division for the Industrial Development Area

For the Industrial Development, three kinds of areas are proposed. Each area has different characteristics, as follows:

Area I/Basic Location, i.e. in the form of a basic industrial region, where the base of economic life lies on the industry. The area concerned covers Surabaya, Gresik, Sidoarjo, Mojokerto and Banyuwangi.

Area II/Main Location, i.e. in the form of an area for light industrial activities, such as agricultural produce processing industry, with the nature of being "labour intensive". The area concerned covers Malang, Pasuruan, Probolinggo, Kediri, Blitar, Tulungagung, Madiun and Jombang.

Area III/, i.e. an area which still needs the growth of industrial activity which is in accordance with the abilities of the people. i.e. handicraft industry as well as an industry for processing agricultural crops, husbandry, fishery and products. The area concerned covers Jember, Bangkalan, Bojonegoro and Sumenep.

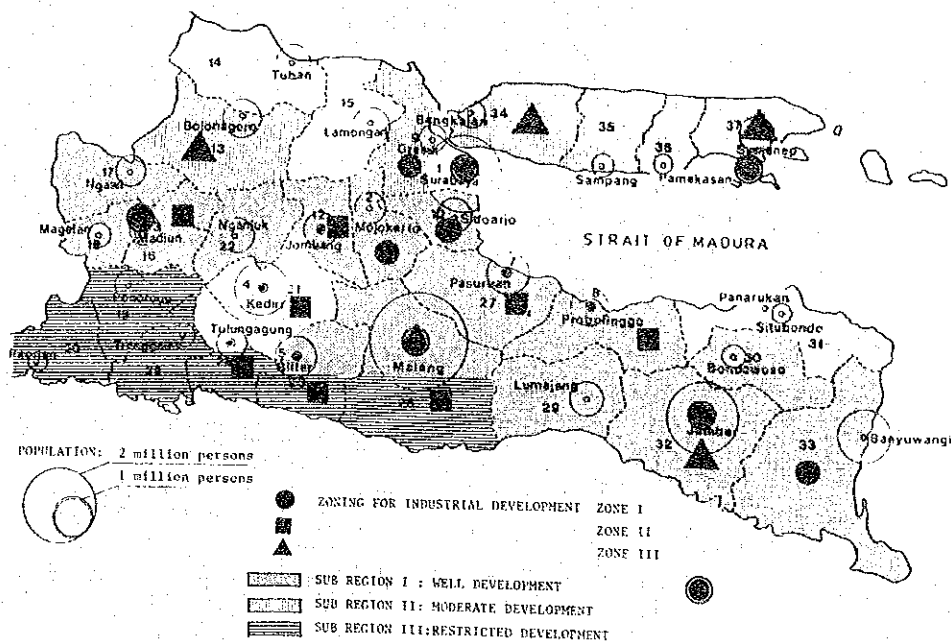


Fig. 4.1.2 ZONING FOR REGIONAL DEVELOPMENT IN EAST JAVA

DEVELOPMENT SYSTEM IN EAST JAVA BY THE MINISTRY OF PUBLIC WORKS

The Ministry of Public Works has executed the regional development based on the system of development units of SWP (Satuan Wilayah Pembangunan = Unit of Development Region) and WPP (Wilayah Pembangunan Partial = Partial Development Unit).

(1) The System of SWP

SWP corresponds to the East Java Province and the city of Surabaya is situated at its centre.

The SWP of East Java, consisting of 37 administrative areas of Grade II (Kotamadya/Kabupaten), has been divided into 27 WPP as shown in Fig. 4.1.3.

A WPP in fact can consist of one or more Sub-Region II's. GKS Region consists of 6 WPP's.

- WPP I with its centre Surabaya also has the hinterland Kabupaten Sidoarjo and a part of the Kabupaten Pasuruan (North West of Pasuruan).
- WPP XIII with its centre Mojokerto also has the hinterland Kabupaten Jombang.
- WPP XXIV with its centre Bangkalan also has the hinterland Kabupaten Bangkalan.
- WPP XXII with its centre Lamongan also has the hinterland Lamongan except the part which belong to XXI.
- WPP XXIII with its centre Gresik also has the hinterland the northern part of the Kabupaten Lamongan i.e. Pacitan and Brondong.

(2) The Character of the six Administrative Areas in GKS

The six administrative areas in GKS will have the following meaning:

- Gresik, is a Sub Region II, which has the chance to develop in a moderate way, whilst for industrial development it is Area I/Basic Location, and in the national scale is the centre of WPP XXIII.
- Bangkalan, is a Sub Region II, which has the chance to develop in a moderate way whilst for industrial development it is Area III, and in the national scale is the centre of WPP XXIV.
- Mojokerto, is a Sub Region I, which has the chance of developing well whilst for industrial development it is Area I/Basic Location, and in the national scale is the centre of WPP XIII.
- Surabaya, is the centre of economic development which in the industrial development is Area I/Basic Location and in the national scale it is the centre of the main development of the C Region also the centre of SWP VII and WPP I.
- Sidoarjo, is a Sub Region I having the chance of developing well whilst for industrial development it is Area I/Basic Location, and in the national scale it is the hinterland of WPP I Surabaya.
- Lamongan is a Sub Region II which has the chance of developing in a moderate way. In the industrial development it is not a priority region and in the national scale it is the centre of the WPP XXII.

Therefore, the six administrative areas in the GKS are the centres of the WPP as defined by PU, while Surabaya is not only the centre of regional development in the GKS, but also the first order city of the SWP and the centre of East Java.

Moreover, Surabaya is the focus and heart of the economic and social activities in East Indonesia, and has a role as the main centre of an extended area which covers East Java, Bali, East Kalimantan, South Kalimantan and Central Kalimantan.

Accordingly, the future function of Surabaya is relative to the larger influence area, and not only relative to GKS. Surabaya should have various functions for high level service as the largest node of distribution service in East Indonesia. These would include not only economic but also social and political activities.

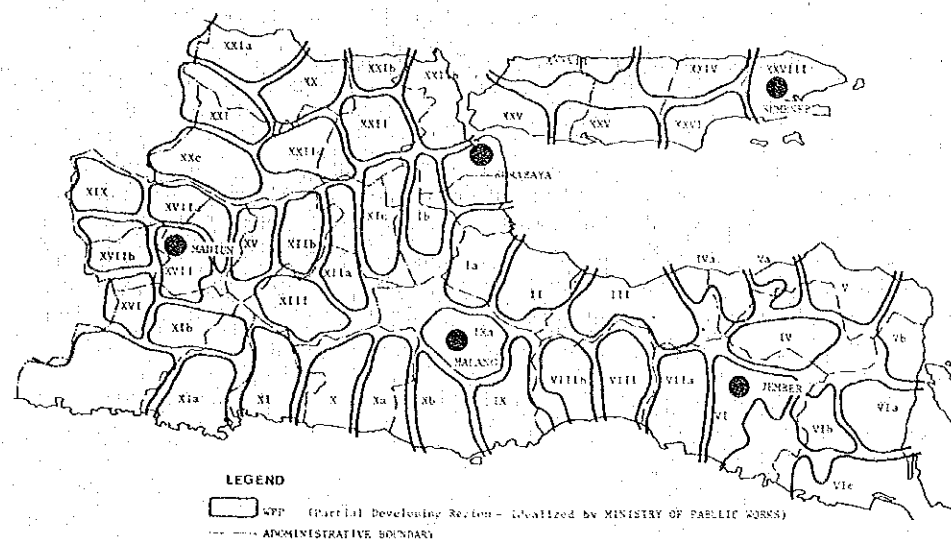


Fig. 4.1.3 REGIONAL DEVELOPMENT CONCEPTS IN EAST JAVA

4.2 LOCAL DEVELOPMENT PLAN IN GKS REGION

4.2.1 LONG-TERM DEVELOPMENT PROPOSALS AND CONCEPTS IN GERBANGKERTO-SUSILA REGION

GENERAL

By observing the regional developments within GKS Region, it can be seen that, there are areas which have a mutual relationship and are much influenced by the development of Surabaya. On the contrary there are also areas which have relatively little connection with Surabaya, especially isolated areas. This fact requires a more guided arrangement for regional development in order to achieve an adjustment and harmony in regional growth. This adjustment and harmony is a principal of the general pattern of Pelita III.

In order to give a clear understanding of the prospects for development and regional economic growth, this section explains what is planned by every municipality of Tingkat II in GKS Region. The general direction of regional development is summarized in Fig. 4.2.1 taken from the Report of GKS Study 1980 and the future prospects of Kotamadya Surabaya are quoted from "Master Plan Surabaya 2000".

KABUPATEN GRESIK

The area of Kabupaten Gresik is a Sub-Region II, and thus has the possibility of developing in a moderate/medium way. Based on this, the area for development have been decided as follows:

- In the city of Gresik the sub districts (Kecamatan) of Manyar and Kebomas are prepared for trading activities, service industries, fishery, salt manufacturing and tourism.
- In Cereme the sub districts (Kecamatan) of Driyorejo and Menganti are prepared and directed for agricultural activities, husbandry and industry.
- In Sedayu the sub-districts (Kecamatan) of Ujung Pangkah, Duduk, Bungah and Panceng for the activities of fishery, agriculture & husbandry and also excavation and plantation.
- In Sangkapura and the sub-districts (Kecamatan) Tumbak and Sangkapura. The emphasis is on husbandry, fishery, plantation and industry. The capacity to fulfil local demand is only available in the sectors of agriculture and construction, and if it is desired that the area should grow, then intensive capital input is needed. For that purpose it is necessary to observe the sectors of mining, electricity, gas and water, commerce, transportation, financial institutions and services.

KABUPATEN BANGKALAN

The Kabupaten Bangkalan is classified as a Sub Region II and is divided into the following areas for development:

- The lowland and plains and coast including the sub districts (Kecamatan), of Sukokilo, Kwanyar, Modung, Kamal, Socah, Klampis, Arusbaya, Bangkalan, Sepuluh and Tanjung Bumi. These are guided towards the activities of industry, husbandry, plantation, fishery and agriculture.
- The intermediate plains cover the sub-districts (Kecamatan) Tanah Merah, Galis, Burneh and Tragah, and these are guided towards industrial activity, plantation, agriculture and husbandry.
- The highland areas cover the sub districts (Kecamatan) of Geger, Kokop and Konang. These are directed to the activities of industry, agriculture and husbandry. The capability of fulfilling local demand is only available in the agricultural and transportation sectors. When it is desired that the Kabupaten Bangkalan should develop, then intensive capital should be directed to the development of commerce, electricity, gas and water, building, transportation and financial institutions.

KABUPATEN KODYA MOJOKERTO

Kabupaten Kodya Mojokerto is classified as a Sub-Region I, and therefore possesses good opportunities and possibilities for successful development. The possible areas of development are:

- Mojosari and its surroundings directed to industrial activity.
- Trowulan and its surroundings should be developed as a tourist area.
- The northern area of the river Brantas are geared for agricultural activity.
- Mojokarto city and its surroundings are developed for governmental and commercial activities.

While the potential to fulfil local demand lies in the sectors of industry, trade and commerce, buildings, transportation, financial institution and services, there are several sectors which need to be supported through intensive capital input i.e. agriculture, electricity, gas and water, and other activities.

KABUPATEN SIDOARJO

The Kabupaten Sidoarjo is also a Sub-Region I and has the possibilities of major development. The decision on areas for development are as follows:

- Sidoarjo and its surroundings should be developed especially as an administrative city, an educational town at the Senior High School level, a town for the collection of industrial products and a transshipment city.
- Krian and its surroundings should be directed to function as the centre of the western regional development and as a centre for collecting agricultural products.
- Porong and its surroundings are mainly directed as a centre for collecting agricultural products and as the centre of regional development for part of the southern area.
- Waru is included in the sub district (Kecamatan) of Taman and development should be directed to industrial activity, and should function as a centre of settlement growth to receive the urbanization of Surabaya City.

The agricultural sector in Sidoarjo must be preserved and subject to intensive mechanisation, because the area of Sidoarjo to the west of the Surabaya - Malang railway is an area of high agricultural potential.

KABUPATEN LAMONGAN

The Kabupaten Lamongan is a Sub-Region II and the areas for development should be as follows:

- Ngimbang including the sub-district (Kecamatan) of Kedung Pring are directed to the activities of agriculture and plantation.
- Babat and its surroundings are directed to the activities of industry, mining and commerce.
- The coastal area including the sub district (Kecamatan) of Brondong and Paciran are concentrating on the development of sea fishery, salt manufacturing and canning industry.
- Glagah and its surroundings are concentrating on the activities of fishery and intensification of agriculture.

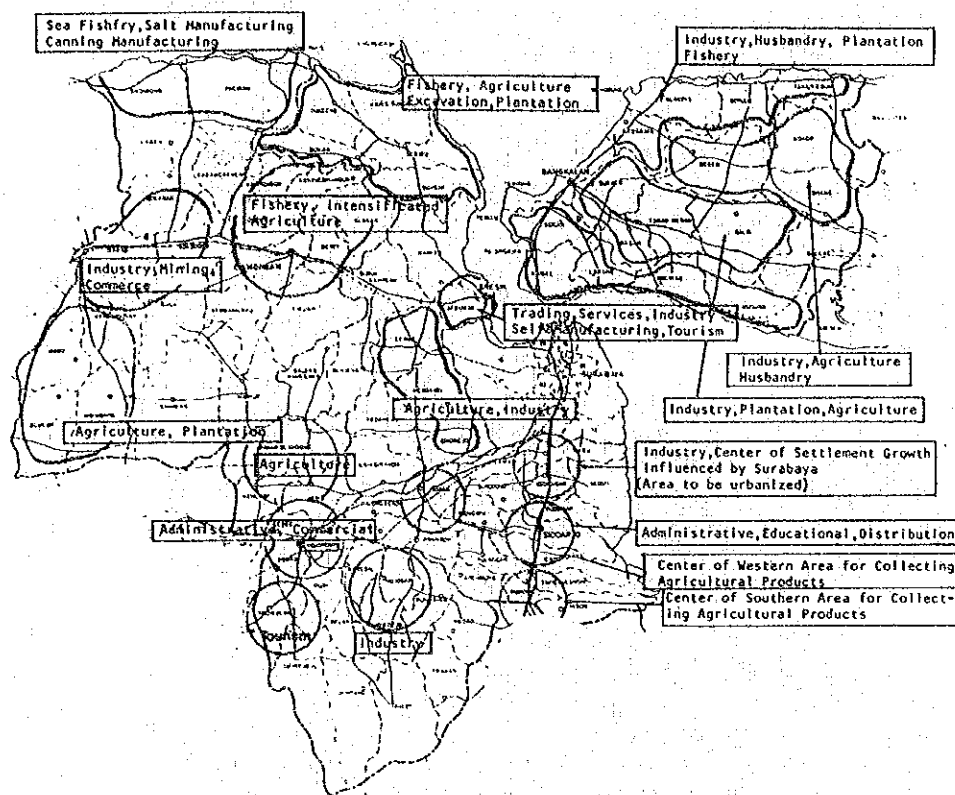


Fig. 4.2.1 DIRECTION OF REGIONAL DEVELOPMENT BY KABUPATEN

4.2.2 DEVELOPMENT PLAN IN URBAN AREA

Some municipalities have already prepared Urban Development Plans, toward the year 1990 and/or 2000. The out-line of them are as follows:

GRESIK URBAN DEVELOPMENT PLAN 2000

This Plan especially considers the way to obtain a harmony between manufacturing development and housing development. There are several significant industrial facilities to be activated in order to achieve socio-economic growth not only in Kabupaten Gresik but also in the whole of GKS Region.

However, the direction of growth of urbanization is restricted by the barrier caused by geographical and geological conditions. Therefore the future expansion of existing industry and housing will be to the West.

According to the assessment, future population and landuse demand for housing is assumed to be 180 thousand persons and approximately 955 ha. respectively, as shown in Table 4.2.1 and 4.2.2.

Table 4.2.1 FUTURE POPULATION GROWTH OF URBAN AREA, GRESIK

Urban Area: 2,696 ha.

Year	Population	Growth Rate	Annual Growth Rate	Density
1975	80,825	100		30 persons/ha
1980	104,353*	1.20	5.2%	39 persons/ha
2001	183,000	2.26	2.8%	68 persons/ha

Remarks: * Excluding the population of Desa Roomo

Notes: Year 2001 data used in this table is from the Report.

Table 4.2.2 LANDUSE COMPOSITION IN URBAN AREA, GRESIK IN 2001

Landuse	Area (ha)	%
1. Port Area	204.8	7.6
2. Central Commercial Area	54	2.0
3. Warehouse Area	80	3.0
4. Public Building Area	59.5	2.2
5. Industrial Area	429.3	15.9
6. Housing Area	984.5	36.5
7. Public Terminal Area	16.5	0.6
8. Green Belt	705.7	26.2
9. Others	161.7	6.0
Total	2,696	100 %

Note: Year 2001 data used in this table is from the Report.

As the population in 1980 is approximately 100 thousand, the average annual growth rate up to 2000 is estimated to be 2.8%. This rate is likely to be achieved if compared with 5.2% from 1975 up to 1980.

The accumulation of industrial facilities is sufficient to support such socio-economic growth.

Gresik urban area is assumed to extend more broadly in the future and the landuse plan in 2000 is shown in Fig. 4.2.3.

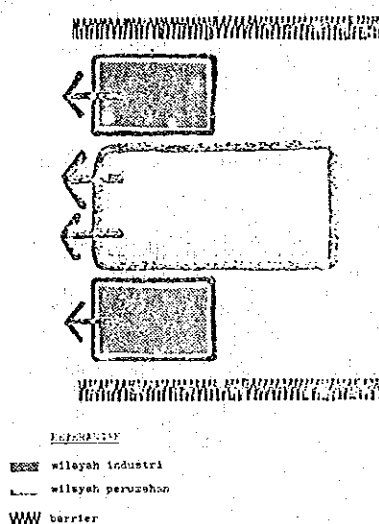


Fig. 4.2.2 URBAN DEVELOPMENT OF GRESIK

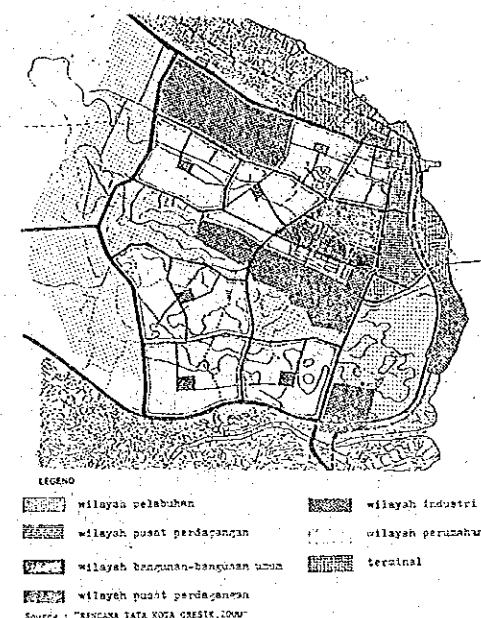


Fig. 4.2.3 LANDUSE PLAN IN GRESIK URBAN AREA IN 2001

BANGKALAN URBAN DEVELOPMENT

Kabupaten Bangkalan has prepared a Master Plan for the urban area in 2000.

According to the Master Plan, the basic consideration for the urban development and planning are:

- The improvement of spatial development to assist in realizing the development of the GKS Region. Planning for the city of Bangkalan will be prepared together with planning for Bangkalan as the capital of the Sub Region II (Daerah Tingkat II).

- The objective of the urban development and planning of Bangkalan is to give effect to the action plan and to carry out in stages the increase in welfare, security and wealth of the people.
- The internal problems faced are over-centralization of the development in the middle of the city and business district, and only one axis in the city main road network thus causing urban and regional traffic congestion.
- The external factors experienced consist of three factors: one is that the function of Bangkalan in having a superior strategic position compared to other Kabupatens in Madura. Second is that Bangkalan is a stepping stone for the inhabitants who are urbanizing to East Java. Third is that the construction of the PERUMNAS housing complex in the area of Kamal is stimulating the surrounding areas.
- As a regulating pattern in planning, a harmonious relationship is needed between:
 - settlement.
 - labour area & commerce
 - recreation area/park
- The policy of the main road network structural plan:

The road network will be emphasized toward the east and partly to the north. For this purpose a second main road of lower standard is needed to help decrease the burden on the existing main road. This will also assist in the opening of development in the neighbourhood of the new road.
- Commercial sector: in the neighbourhood of the public open field (Iemah duwur) and in the west of the public open field. The northern side of Jalan Leman Duwur will be used for godowns of wholesalers and regional products for export. (4 – 5 ha).
- Kindergardens and elementary schools are distributed around the town according to the standard planning, and at least one junior high school is serving one neighbourhood. The location of senior high school or academy are directed to the Eastern part of the city (Kraton)
- Public Hospital serving the Kabupaten is maintained and the quality must be improved.
- PUSKESMAS (Community Health Center) 2 or 3 more are needed for the future each serving ±50,000 inhabitants (Bangkalan City).
- Recreation & parks:
 - The field for the "bull race" uses the existing stadium and this condition can be maintained by solving the traffic problem.
 - Two more 400 seat cinemas are needed with one also used as a theatre in a location near the centre of the town.
 - Recreation at the west-side seashore can be realized in stages.
- Fish Market & Abattoir: The location of the fish market can be maintained but its quality and facilities can be improved.

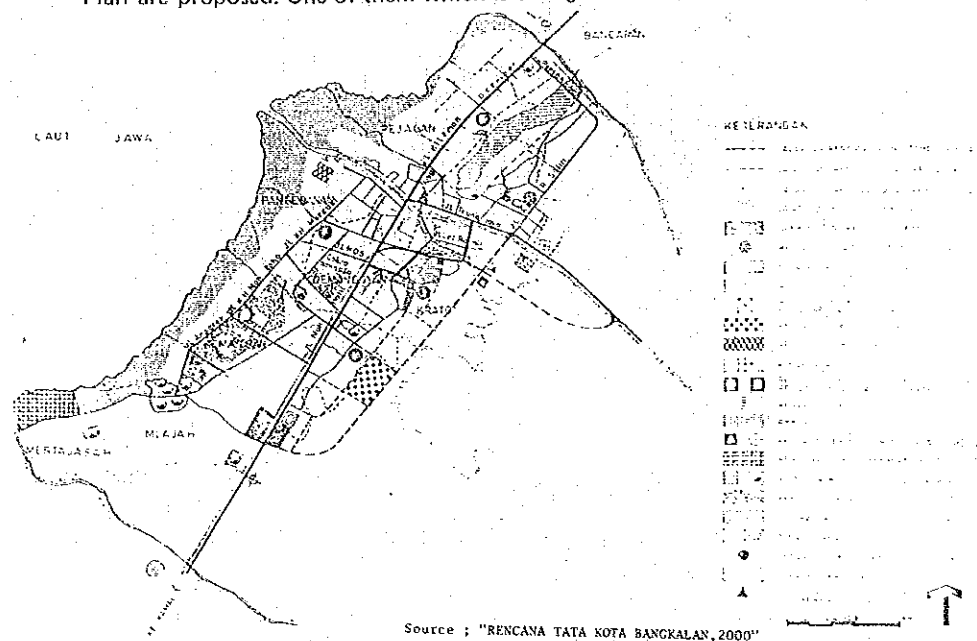
The abattoir is moved to the west side of the city near the harbour and fish market.
- Industrial area: cattle food industry, tapioca flour industry, packing of processed fish, and people's handicraft.

Proposed location of these industries is the eastern side of the city (in the direction of Sampang), North-east of the Stadium, and Southern and western part of the city. In the area outside Bangkalan City, roofing tile industry, cement industry and limestone burning industry can be developed.
- Bus and taxi terminal:

Considering the city's internal problems as well as the communication needs with the hinterland, it is proposed to prepare a location for the Bus and Oplet transportation

terminal in the eastern part of the city.

- Sanitation and Drainage:
 - to widen and to deepen the Kali Bangkalan & Kali Saksak
 - to widen the channel along the Jalan Dr. Chalil with the so-called "closed system"
 - making a discharge channel with a width of ±1.5 meters along the planned new main road (at the Eastern part of the city) connected to the River (Kali) Gayam.
- Based on these planning conditions and concepts, four alternatives for the Master Plan are proposed. One of them which is thought to be typical is shown in Fig. 4.2.4.



Source : "RENCANA TATA KOTA BANGKALAN, 2000"
 Fig. 4.2.4 MASTER PLAN 2000 IN BANGKALAN
 (ALTERNATIVE III)

MOJOKERTO URBAN DEVELOPMENT PLAN (KOTAMADYA MOJOKERTO)

According to the report "RENCANA GARIS BESAR TATA KOTA MOJOKERTO 1978 – 98", the future prospects for the urban planning are as follows:

(1) Planning Area

The Kotamadya of Mojokerto is about 50 km to the West of the city of Surabaya with an area of 7.25 km², consisting of:

- technically irrigated "sawah" (rice-fields)	227.3 ha.
- semi-technically irrigated "sawah"	113.5 ha.
- dry fields (not irrigated) used for agriculture, fields depending on rainfall used for agriculture, dry fields (not irrigated) used for agriculture which are located near houses	47.3 ha.
- Gardens/fields	235.5 ha.
- Others (roads, rivers, cemetery, etc.)	101.4 ha.
Total:	725.0 ha.

(2) Population

1971	60,013	
1980	60,847	: average annual growth rate (71–80) 1.5%
1988	110,345	: Estimate

The density of population in the Wilayah Kotamadya Daerah Tingkat II Mojokerto on the average square kilometer is 9,500 persons, forming the most densely populated area in the Region of the East Java Province.

(3) Urbanization

Based on the existing survey, the city of Mojokerto has a trend to become an educational, commercial and industrial city within the scope of the regional development of East Java especially in the GERBANGKERTOSUSILA Region.

This matter has been proved, and is supported by the city location which is on the Surabaya — Solo regional axis. This axis is very busy, both for general transportation by truck and bus, or transportation by train. Observing the existing landuse, it is obvious that the largest development is in the direction of Jombang and Surabaya. However, the development into the direction of Surabaya i.e. the settlement area along the Surabaya River is restricted. The restrictions on developing the city of Mojokerto are as follows:

- The existence of the Kali Brantas/Kali Porong is the most dominant feature and the city cannot develop to the North of these rivers. The road toward Surabaya runs along the river and the development is linear, which is extremely disadvantageous especially in preparing facilities. In the city the dominant area is the southern part of Kali Brantas/Porong, where there are urban facilities, government centres, trading centres, etc. It is logical to develop in the southern direction of the Kali Brantas/Kali Porong and towards the East of Kali Brangkal.
- The existence of the railway through the city, also has nearly the same effect as the river. The railway through the city is the main line and is also the railway toward Mojosari. The railway cannot be replaced by main roads, because of its capacity for mass transit. The railway crosses the city roads and the main development is towards the northern side of the railway. From this description it is clear that the city should be developed away from the Kali Brantas/Kali Porong toward the South and from the Kali Brangkal toward the East.

(4) Landuse Planning

The planning for landuse pattern up to the year 1998 is described in Fig. 4.2.5. The conclusion of the landuse planning, which is the basis of Mojokerto, is based on the land conditions and situation, and the planned division of regions or zones can be seen on the drawing.

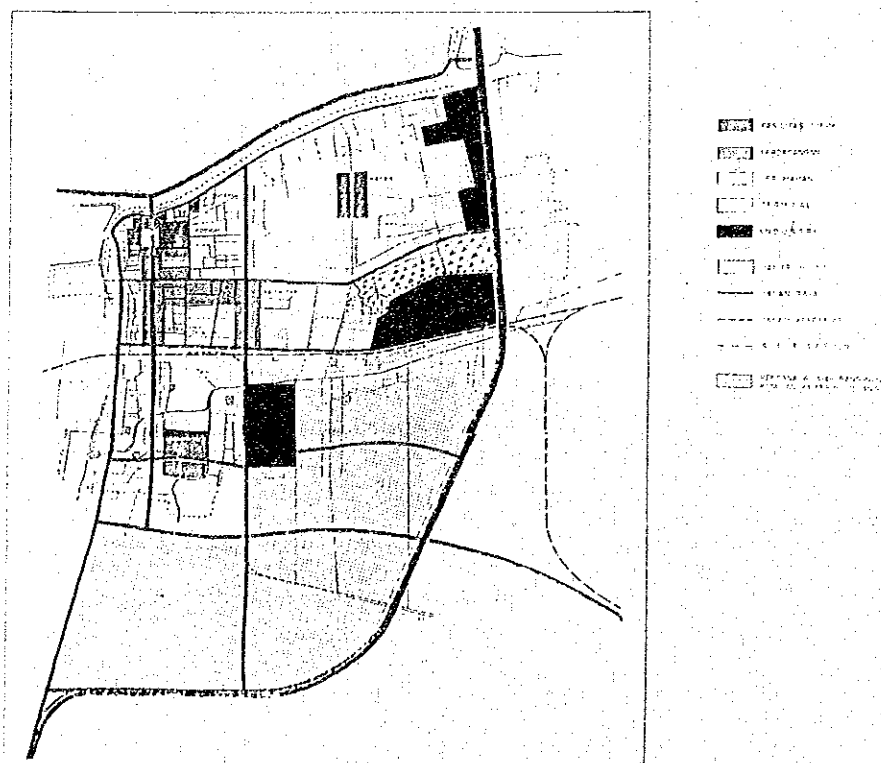


Fig. 4.2.5 LANDUSE PLAN 1998 IN KOD. MOJOKERTO

To reach the planning objective it is necessary to undertake the following policies:

- Increasing the urban economic level by means of giving employment opportunities to all citizens, through the improvement of efforts in the field of economy, commerce and industry.
- Providing sufficient area for housing with various levels of density, so that citizens of all economic levels have a chance to participate and be able to possess their own house.
- Giving more opportunities to all citizens to carry out social and cultural activities.

(5) Major Development Projects

From these objectives, therefore the region will be developed to include an area of 860 ha, the landuse of which will be as follows:

— Housing	:	568 Ha (66%)
— Commerce	:	43 Ha (5%)
— Public facilities/office	:	34 Ha (4%)
— Industry	:	120 Ha (14%)
— Green belt	:	82 Ha (9.5%)
— Others	:	13 Ha (1.5%)

In developing the city according to society demands for service improvements, several projects will be constructed:

- A three-floor shopping center, located at the ex-Kranggan Bus Terminal with a pure self-help fund of Rp.500,000,000.
- The construction of the Pemda Kodya Mojokerto office, three floored, located at the ex-Gelombang Balongsari and the building of institutional offices.
- The building of barracks for the Tuan Wisma/Tuna Karya (= houseless & jobless people) located at the Kelurahan Kedundung and Mentikan (perhaps five in number), and the continued construction of the first stage of housing for becak drivers.
- The construction of Siponredjo bridge on the Kali Brangkal to improve connections.
- The construction of a Settlement Environment Improvement Scheme for an area of 50 Ha (Urban V). This is a follow-up to the pioneering effort of the KIP Project.

KOTAMADYA SURABAYA

For the future prospects of urban planning in Surabaya, the "Master Plan Surabaya 2000 (May 1977)" should be considered. The outline of the plan is summarized as follows:

- The main purpose of the Master Plan for Surabaya is to direct future physical growth and socio-economic development, so that on the one hand, haphazard proliferation of quasi-urban or unsatisfactory development can be minimized and to some extent controlled; and on the other, to order and encourage development such that it brings positive benefits to a maximum number of the city's inhabitants.
- A comprehensive development planning strategy for agricultural, infrastructural and urban development components is to be drawn up for GKS in the near future with the help of Cipta Karya, and when this is finalized it will constitute the major factor influencing the city's growth and expansion. The aim of the development strategy in GKS is to build up linkages between the settlements and their respective hinterlands and between the settlements themselves.
- By the year 2000 there are expected to be 1,126,000 resident families in Surabaya of which 85% are expected to be earning (using constant 1974 money value) less than 30,000 Rupiahs per month. Based on family income projection, the number of families in the 15,000 — 30,000 Rupiahs per month is expected to jump from 184,000 to 486,000 in the same period. The proportion of families in the two highest income groups will fall significantly, although the actual numbers will increase sharply.

- Growth in road traffic will be considerable. By the end of the plan period there are expected to be 700,000 motor-cycles and 110,000 cars in the city. Heavy goods traffic is likely to grow at 7% per annum, while light goods will increase at 15% per annum.
- For reasons of sewerage and drainage, an extensive system of water channels has been constructed over the years in Surabaya. Much of the mechanical equipment is now old and in need of replacement. Because of lack of maintenance, mechanical problems and increasing population growth, the drainage system does not function efficiently and the consequence can be seen in the serious flooding problems that occur year after year in parts of the CBD.
- The goals of development in Surabaya can be summarized as:
 - to consolidate and improve the national status of the city;
 - to work for closer regional integration;
 - to develop a wider range of accessible socio-economic and physical opportunities;
 - to encourage functional efficiency and environmental attractiveness of urban development; and,
 - to use resources effectively through positive action and control,
- Using selected differential densities and allowing for land which cannot be developed, urban development generated by a population of 5.5 million by 2000 would cover some 40,000 ha, including 11,000 ha outside the city boundary. Overall urban density will amount to 165 pph, 230 pph in the inner city and 150 pph in the outer city and on developed land immediately outside the city boundaries.
- To obtain the greatest economies for "threshold" cost on infrastructure investment, a transportation policy based on radial and ring type routes is proposed, linking the existing city with the new development areas. In practice urban units would be located along the main radial routes to the south, southwest and west. Sub-city centres are proposed next to the southern and western radial routes.
- An additional 1,400 ha of industrial land will be required by the year 2000. Large scale developments are expected to consolidate at Tandes, Tandes Segitiga, within the Port Area and at Rungkut in the south east. The remainder (800 ha) should be distributed as medium (60 - 80 ha) sites at the urban unit level and small (10 ha) at the district unit level in order to reduce time and distance of journey to work and to avoid the excessive agglomeration of industries into a small number of areas where pollution could become a serious problem.
- Rationalization of the urban rail system is recommended. A new rail connection linking the line from the west and south should be constructed and Gubeng station should become the main passenger terminus for Surabaya, and Sidotopo the main freight yard.
- Whatever detailed breakdown in departmental responsibilities is eventually decided upon, it must be acknowledged that all future development in Surabaya, all development studies, and all private and public investment projects, should fall within the basic concepts of the Master Plan. (Refer to Fig. 4.2.6)

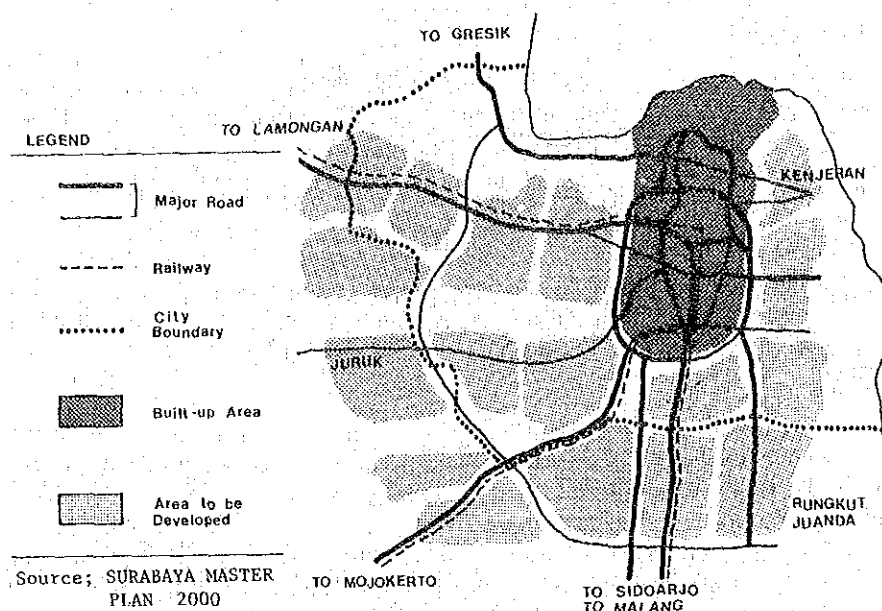


Fig. 4.2.6 CONCEPTIONAL STRUCTURE IN "SURABAYA MASTER PLAN 2000"

4.3 ON-GOING PROJECTS

4.3.1 OUTLINE OF ON-GOING PROJECTS IN EAST JAVA

Data and information on the major on-going development projects have been collected from the relevant authorities, and the following includes data collected by GKS Study Team (1980).

ROAD BETTERMENT AND DEVELOPMENT

Some betterment projects for the primary roads are being carried out in order to emphasize a connection between first-order and second-order cities.

Fig. 4.3.1 shows the condition of implementation for that project. Currently, the encouragement of the East-West axis roads between Banyuwangi and the Western part of East Java through Surabaya, and the North-South road between Surabaya and Malang are on-going. Surabaya-Malang Tollway is under construction and Surabaya-Gresik Tollway has been planned.

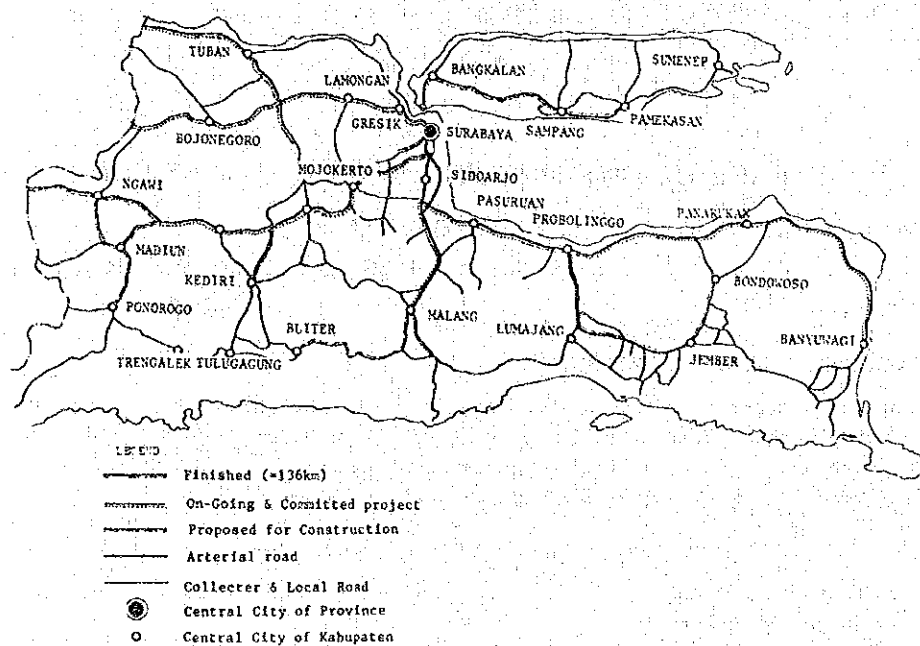


Fig. 4.3.1 ROAD BETTERMENT PROGRAMME IN EAST JAVA

INDUSTRIAL DEVELOPMENT

(1) General

The Government has made an effort to develop the industrial potential by the inducement of foreign and domestic investment using the investment programme of PELITA-III. Five industrial development centres have been nominated and industrial areas/zones have been designated according to three categories:

The five industrial development centres are:

- Surabaya : for Manufacturing, Trade, Maritime, Industrial and Education
- Madiun : for Forestry Products and Mining
- Malang : for Agricultural products
- Jember : for Estate products
- Sumenep : for Salt

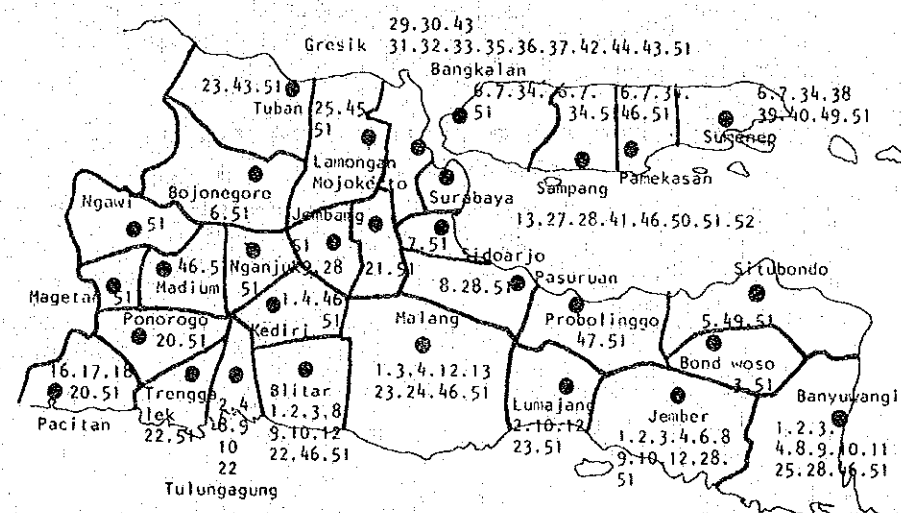
The industrial areas/zones are divided according to three categories:

- Basic location, whose main economic activity is manufacturing, such as Surabaya, Gresik, Sidoarjo, Mojokerto and Banyuwangi.

These areas are important for basic industries such as the chemical and maritime industries; for light industries such as processing of substitute import goods; and export commodities.

- Main industry location are Malang, Pasuruan, Probolinggo, Kediri, Blitar, Tulungagung, Madiun, and Jombang;
- In these areas are located labour-intensive light industries or industries related to agriculture, forestry, farm and fishery products.
- Handicraft industries which will be developed in accordance with the area's potential, include the processing of agricultural products, animal husbandry, fishery and estates. Development will be in the following locations: Jember, Bangkalan, Bojonegoro, and Sumenep.

The detailed programme for industrial investment described in PELITA-III is shown in Fig. 4.3.2.



I. <u>PLANTATIONS</u>	20. GYPSUM	36. ACID CENTRE
1. RUBBER	21. IODINE	37. PETRO CHEMICAL PROJECT
2. COCONUT	22. KAOLIN	VII. <u>CHEMICAL INDUSTRY</u>
3. COFFEE	22. -A. MARBLE	38. CAUSTIC SODA
4. CACAO	IV. <u>FOOD & BEVERAGE INDUSTRY</u>	39. CHLOOR
5. COTTON	23. FRUIT JUICE CANNING	40. SODA ASH
6. TOBACCO	24. VEGETABLE CANNING	41. CARBIDE
7. CASHEW	V. <u>VARIOUS KIND OF INDUSTRIES</u>	42. ALUMINIUM SULPHATE
8. CAPOC	25. FISH MEAL INDUSTRY	43. CARBON BLACK
9. CLOVE	26. COMPOUND FEED	44. SHEET GLASS
10. TEA	27. GARMENT	45. PORTLAND CEMENT
11. ABACA	28. COW & BUFFALO LEATHER	VIII. <u>TOURISM</u>
12. CASIA VERA	VI. <u>CHEMICAL INDUSTRY</u>	46. HOTEL
II. <u>CATTLE</u>	29. LIQUID CO. & DRY ICE	47. CABLE CAR
13. LAYER	30. FERTILIZER	48. TOURIST BUS
14. BROILER	31. PIER/JETTY	49. FERRY
15. BREEDING	32. WATER SUPPLY SYSTEM	IX. <u>SERVICE INDUSTRY</u>
III. <u>MININGS</u>	33. AGRO CHEMICAL MATERIAL	50. SALVAGE
16. COPPER	34. NATURAL GAS EXPLORATION	51. PUBLIC GODOWN
17. LEAD	35. CHEMICAL MATERIAL FOR INDUSTRY	52. BONDED WAREHOUSE/EXPORT PROCESSING ZONE
18. ZINC		
19. SULPHUR		

Fig. 4.3.2 INDUSTRIAL INVESTMENT PROGRAMME IN EAST JAVA (PELITA III)

(2) Incentive Programme for Major Factories

The expanding projects of several Government-owned companies are shown in Table 4.3.1. According to Government information in addition to these is the aggressive industrial encouragement in Gresik.

The following major factories to be induced are:

- Pt. Kuncil Kedamean Sheet Glass (Kab. Gresik)
1985 - 120,000 ton/annum: Sheet Glass
- Project Soda Abu Gresik (Kab. Gresik)
1985/86 - 200,000 ton/annum: Soda ash
- Project Bahan Aktip Pestisida (Kab. Gresik)
- 5,000 ton/annum: Pesticide

Moreover, in East Java several prospective projects are:

- Cement Project in Tuban Area

Anticipated deposits of limestone and clay are assumed at 237.5 million metric tons and 17.4 million metric tons respectively. Based on these resources, it is assumed that cement production of 1 million ton/year can last for at least 100 years.

- Mining Projects

In Pacitan there are several mining deposits i.e. copper (capacity 500 ton/day), Zinc (capacity 500 ton/day) and lead (capacity 500 ton/day). This project has been surveyed by some experts from Korea but the present domestic investor has financial difficulties.

Table 4.3.1 EXPANDING PROJECTS OF GOVERNMENT-OWNED FACTORIES

Name of Company	Existing Production Capacity	Future Expansion	Others
1. PT. PETROKIMIA GRESIK (Kab. Gresik)	Urea 45,000 ton/annum Z.A. 250,000 ton/annum ISP. I 550,000 ton/annum D A P 80,000 ton/annum N P K 50,000 ton/annum H ₂ SO ₄ 12,000 ton/annum	First Stage (1981 - 1982) - Expansion of ISP Project (500,000 ton) Second Stage (1981 - 1984) - Construction of phosphatic acid (Capacity 300,000 ton/year) - Construction of Cement recinder project (Capacity 440,000 ton/year) - Construction of ZA fertilizer (Capacity 250,000 ton/year) - Construction of Aluminium Fluoride (Capacity 12,600 ton/year) Total Capacity of ISP is 1.3 million up to 1986	- Port expansion - Water Purification Project (Capacity 0.42 t/sec.)
2. PT. SEMEN MADULA (Kab. Bangkalan) - Cement Production	1.5 million ton/annum (PT. SEMEN GRESIK)	The new cement plant in Kamel Area is to be constructed. (Capacity, 2.0 million ton/annum) Estimated investment: US\$400 million. The maximum capacity at the ultimate stage will be 5 million ton/annum.	- Inclusive Port Development
3. PN LECES (Kab. Probolinggo) - Paper Production	30,000 ton/annum of Printing paper (in 1982)	109,000 ton/annum of new print up to 1985. Capital investment needed: US\$250 million.	
4. PT. NERTAS BASUKI RACHMAT (Kab. Banyuwangi) - Paper Production	13,800 ton/annum: Printing Paper	Additional 6,200/annum of thin paper Investment needed: US\$10 million	

ELECTRICITY DEVELOPMENT

The amount of new electric power produced in East Java is expected to be as follows:

Table 4.3.2 ELECTRICITY DEVELOPMENT PROJECT

Power Source	1980/81	1983/84	1986/87
Hydro	125 MW	158.5 MW	188.5 MW
Oil Fired	205	585	585
Total Capacity	330	743.5	773.5
Capacity Increase* from present	-	413.5	443.5

Notes: *Lodoyo Dam Development : 4.5 MW from 1982/83.
Seugguruh Dam Development : 29 MW from 1983/84.
Kesamben Dam Development : 30 MW from 1984/85
Gresik Thermoelectric Power Station: Extension upto 380 MW in 1983/84 (200 MW in 1981/82)

4.3.2 OUTLINE OF ON-GOING PROJECTS IN GKS REGION

MAJOR PROJECTS FOR URBAN DEVELOPMENT

The outline of the major projects are shown in Table 4.3.3 and the locations are illustrated in Fig. 4.3.3.

KAMPUNG IMPROVEMENT PROJECTS

Kampung Improvement Projects have been continued since 1976 mainly in the urban area of Surabaya, and are based on finance of 65% from the World Bank and 35% from the government. To date, two projects known as "Urban II (1976 - 79)" and "Urban III (1979 - 82)" have been processed and Urban III is still on-going.

The Urban III Project consists of the four sub-projects of:

- Kampung Improvement
- Drainage Development
- Solid Waste System Development
- Community Health Center (C.H.W.) Development

The major purpose of K.I.P is the implementation of environmental improvement of high-density housing areas. It is divided into the following enterprises:

- Local Road Improvement (less than 6 m in width)
- Footpath Development
- Distributional Drainage Development
- Distribution Sewage Development
- Primary School Development
- Sub-center of Health Development
- Some kind of community facilities such as community hall, public toilet, play-lot, etc.

The actual developed area during the period of Urban II (1976-1979) was approximately 441 ha (18 areas), serving about 269 thousand persons from these areas.

During the Urban III period (1979-1982) work is being implemented on approximately 613 ha with a population of 233 thousand. The total area and number of projects for the overall KIP programs is estimated to be about 1,054 ha and 45 kampung respectively, and the number of inhabitants in these areas is approximately 492 thousand, as shown in Tables 4.3.4 and 4.3.5.

The locations of projects executed by K.I.P are shown in Fig. 4.3.4.

From an urban planning point of view, KIP has a significant function for the policy of residential area development. Surabaya with an area of about 29,178 ha is sub-divided into 16 kecamatans. The older kecamatans, 11 in number, have an area of 6,720 ha and occupy 23.0% of the whole area. About 55% of the old kecamatan area, approximately 3,700 ha, consists of kampung neighbourhoods to be improved and these have a population of about 1.46 million people. This is 60% of the total population in Surabaya.

According to the above considerations, an area of about 2,650 ha remains to be improved. Therefore, further programmes for KIP are expected to be prepared in accordance with the need. In investigating the problems for the execution of KIP, the Study Team obtained the following opinions from interviews with the relevant authorities:

- The largest obstruction for execution is the difficulty of land acquisition for expansion of road width and for public facility preparation.
- The current system of KIP has no obligation on the inhabitants to pay the money equivalent to the benefits resulting from the improvement project. However, taking account of the possible limitation of budget in the future, a new system should be considered in order to ensure more extensive implementation of the scheme. Such a new system may be that the beneficiaries are obliged to pay at least part of the cost of implementation.

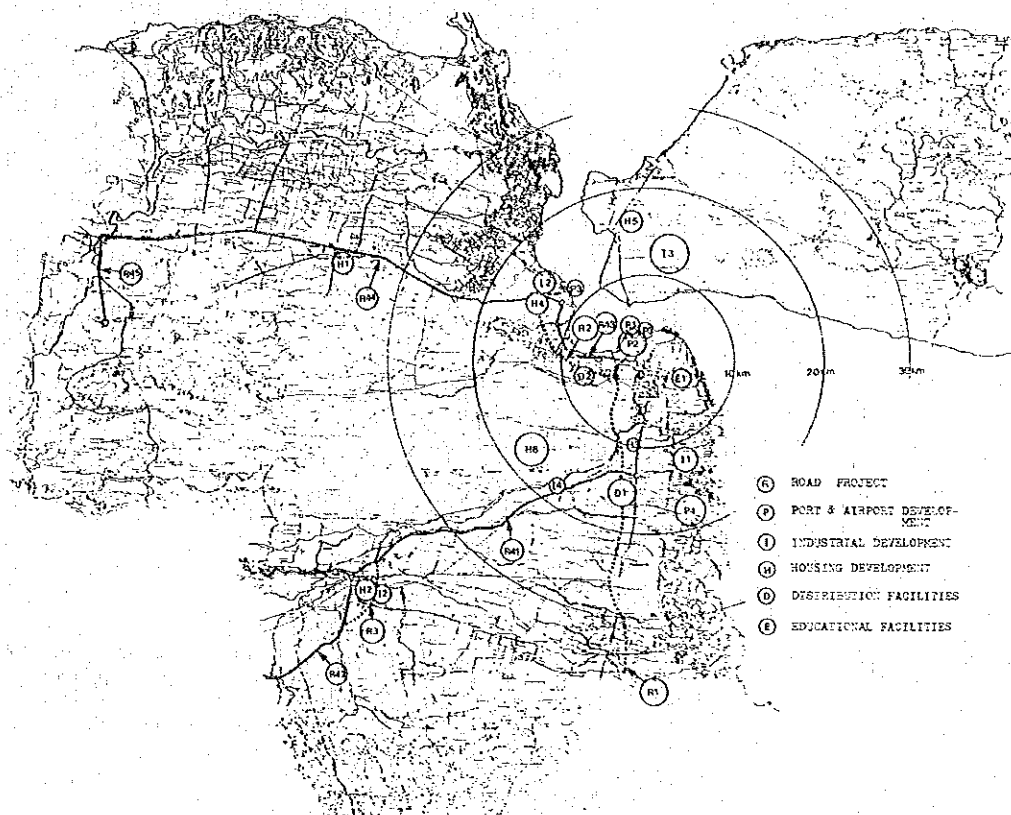


Fig. 4.3.3 DISTRIBUTION OF ON-GOING PROJECTS



Fig. 4.3.4 LOCATIONS OF KAMPUNG IMPROVEMENT PROJECTS

Table 4.3.3 OUTLINE OF ON-GOING PROJECTS IN GKS REGION

(1/4)

PROJECT	ROAD (R.1) (NEW CONSTRUCTION) SURABAYA - KALANG TOLLWAY	ROAD (R.2) (NEW CONSTRUCTION) SURABAYA - GRESIK TOLLWAY	ROAD (R.3) (NEW CONSTRUCTION) MOJOKERTO BY-PASS TOLLWAY	(R.4) ROAD IMPROVEMENT PROJECT		
AUTHORITY	BINA MARGA	BINA MARGA	BINA MARGA	BINA MARGA		
LOCATION	SURABAYA-PORONG	SURABAYA GRESIK	MOJOKERTO	WARU - KERTOSONO	SURABAYA - BABAT	
OUTLINE	Total Length : 104 Km Interchange : 7 Intersections: 9 Amount: US \$ 71 million	Total Length :	Total Length : 10.2 Km Total Cost : Rp 2.25 x 10 ⁶	R 41 : Waru-Mojokerto R 42 : Mojokerto - Kertosono Total : 72.7 Km	R 43 : Surabaya-Gresik R 44 : Gresik -Babat R 45 : Babat-Ngimbang Total : 105.9 Km (R 43 + R 44) : 21.9 Km (R 45)	
FINANCE	ADB/SAUDI FUND		IBRD	IBRD	ADF	
PROGRESS	UNDER CONSTRUCTION (Tg.Perak-Gurpol)	UNDER STUDY(F/S)	UNDER CONSTRUCTION	UNDER CONSTRUCTION OR COMPLETED	UNDER CONSTRUCTION OR COMPLETED	
NOTE	Refer to Fig.4.6.15	Refer to Fig.4.6.16				

ON - GOING PROJECT IN G K S .

(2/4)

PROJECT	PORT (P.1) Tg. Perak Port Deve- lopment	PORT (P.2) Supporting Area Deve- lopment of Tg. Perak Port	PORT (P.3) Kali Mas Port Rejuvenation Project	AIRPORT (P4) Juanda Airport Development	RIVER (R1) Repair and Develop-ment of River	INDUSTRY (I1) Expansion Project of SIER (Surabaya Indus- trial Estate Rungtut)
AUTHORITY	Port Administration of Surabaya	Port Administration of Surabaya	Port Administration of Surabaya	Port Administration	Brantas Hill Project Office	PT. Surabaya Industrial Estate Rungtut
LOCATION	Surabaya	Surabaya	Surabaya	Sidoarjo	G K S .	Sidoarjo/Surabaya
OUTLINE	Phase-I (Under Construction) -Expansion of Wharf Berth : 8 Berth 640 m Storage : 29,000 m ² Phase-II (F/S) -Expansion of Tg. Perak Short Ter- (181 - 55) Medium Term (186-19) Long Term (191-2000)	-Utilization of the land of the past airport of Air Force Base (300 Ha) -Redevelopment Project in Tg.Perak Area managed by Port Administration (500 Ha) -Container yard, warehouses Factories, Distribution Facilities, etc .	-Removing to Gresik up-to 1985 : Berth of 1600 m . up to 1990 : berth of 3400 m - Cost - 1985 :Rp.4,200 million - 1990 :Rp.3,400 million	Master Plan in 2000 Prepared by French Consultant -Expansion and Repair of Run-Way, Taxi-Way, Apron, Terminal Building, Access Road, etc -Existing Runway : 3660 m	Reported in the Progress Report I	-Expansion Area : 50 Ha -Existing Developed Area : 240 Ha * SIER is one of the major Industrial Complexes in Surabaya More than 80% has been already occupied with the full equip- ments such as Water Treatment and Gas facilities .
FINANCE	ADB					PT. SIER
PROGRESS	Phase II : F/S (Draft Final as of April,1982)	Master Plan	Master Plan	Detail Design		Master Plan
NOTE						

ON - GOING PROJECT IN G.K.S.

(3/4)

PROJECT	INDUSTRY (I 2) Development Projects Of Industrial Complex	INDUSTRY (I 3) Development of Cement Factory	INDUSTRY (I 4) Industrial Complex For Small Factories	(D 1) Distribution Truck Terminal	(D 2) Truck Terminal	(E 1) University ITS Relocation Project
AUTHORITY	PT. SIEM	PT. CEMEN GRESIK	Dep. Industry/ Kabupaten Sidoarjo (Lingkungan Industri Kecil Sidoarjo)	Tentatively (PT. Truck Terminal Waru)		Dep. Education
LOCATION	Mojokerto / Gresik	Bangkalan	Sidoarjo	Waru / Sidoarjo	Tandes	Surabaya/Kec.Sukolilo
OUTLINE	Some Industrial Complex with same scale as Rungkut (249 Ha) are being planned in Gresik and/ or Mojokerto by PT. SIEM	- The location ; near the Kasal Ferry Port - Area : 400 Ha-900 Ha - There exists the exclusive port develop- ment project at the East of Kasal Ferry Port . - Capacity : 2 million ton/year - Employee : First Stage 5000 persons	- Area : 8 Ha - Building Area : 2.5 Ha - Administration : 3.5 Ha - Training Centers : 20 Ha - Amount : Rp. 1.6 billion - Standard units : 77 units - Size of Land Units (300 m ² (500 m ² (800 m ²	- Area : 30 Ha - Function : Distribution of Cargo - Truck Parking - STORAGE - Only trucks of More Than 5 ton capacity		- Area : About 200 Ha - Relocation and Development For Institute Technology Surabaya
FINANCE		PT. CEMEN GRESIK	Central Government / Kab. Sidoarjo / Bank	Central Government / Kab. Surabaya/Bank		
PROGRESS	Investigation of location	Under Partial Construc- tion (On studying)	Under Construction ; Partially Occupied	On Studying (F/S)	Master Plan	Under Construction (Partially Completed)
NOTE						

ON - GOING PROJECT IN G.K.S.

(4/4)

	HOUSING (H 1) Housing Development	(H 2) Housing Development	(H 3) Housing Development	(H 4) Housing Projects	(H 5) Housing Project	(H 6) New Town Project
AUTHORITY	PERUMNAS	PERUMNAS	PERUMNAS	PERUMNAS	PERUMNAS	PERUMNAS
LOCATION	Lamongan	Mojokerto	Surabaya / Wonorejo	Gresik	Bangkalan	Sidoarjo/Diyorejo
	Area : 27.1 Ha Unit : 1300 ('82/83) Implementation : Oct. '82	Area : 42.8 Ha Unit : 1000 Implementation : Oct. '82	Area : 6.5 Ha Unit : 3500	Area : 30 Ha Unit : 1500	Area : 60 Ha Unit : 3000	Area : 500 Ha Unit : 25000 Including Some Industry Water Supply Problem to be solved
FINANCE	PERUMNAS	PERUMNAS	PERUMNAS	PERUMNAS	PERUMNAS	PERUMNAS
PROGRESS	Land Acquisition	Land Acquisition	Land Acquisition	on studying	on Studying	on Studying
NOTE						Under negotiation with land owner .

Table 4.3.4 SCHEDULE OF SURABAYA KAMPUNG IMPROVEMENT PROJECT (KIP) 1976-1982

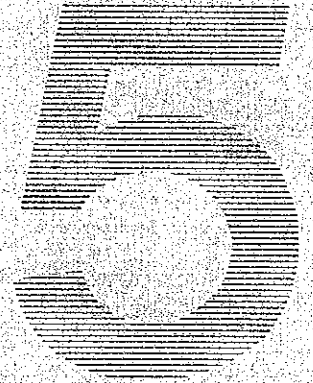
No.	K a m p u n g	Area	Population	Year	NOTE
1	Karangrejo	35 Ha	16,800	1976 - 1977	KIP Urban II
2	Gubeng Masjid/Klingsingan	17 Ha	10,700	"	"
3	Tembok Dukuh I	15 Ha	10,200	"	"
1	Ujung	24 Ha	18,100	1977 - 1978	KIP Urban II
2	Wonokusumo I	32 Ha	22,115	"	"
3	Sidotopo	20 Ha	11,600	"	"
4	Simolawang I	19 Ha	17,720	"	"
5	Kapasari A	11 Ha	4,800	"	"
6	Kedungdoro I	19 Ha	20,500	"	"
1	Perak Timur	29 Ha	17,700	1978 - 1979	KIP Urban II
2	Dupak	34 Ha	15,000	"	"
3	Jepara	32 Ha	14,000	"	"
4	Gundih	10 Ha	6,300	"	"
5	Tembok Dukuh II	14 Ha	5,500	"	"
6	Kedungdoro II	20 Ha	20,000	"	"
7	Tegalsari	25 Ha	18,250	"	"
8	Wonorejo	55 Ha	19,250	"	"
9	Putat Jaya	30 Ha	20,600	"	"
1	Penggirian	17 Ha	6,800	1979 - 1980	KIP Urban III
2	Wonokusumo II	14 Ha	4,200	"	"
3	Tombaksari	17 Ha	6,800	"	"
4	Kapasan	17 Ha	6,630	"	"
5	Sidodadi	21 Ha	10,500	"	"
6	Kupang Krajan Utara	15 Ha	6,300	"	"
7	Kupang Krajan Selatan	12 Ha	5,040	"	"
8	Banyuurip Barat	20 Ha	7,800	"	"
9	Kemayoran	14 Ha	6,650	"	"
10	Pakis Utara	29 Ha	14,065	"	"
1	Kapas Lor	22 Ha	15,070	1980 - 1981	KIP Urban III
2	Putat Jaya II	40 Ha	27,400	"	"
3	Kapas Madya	18 Ha	10,800	"	"
4	Kapas Baru Barat	17 Ha	10,285	"	"
5	Ngagelrejo Timur	34 Ha	11,395	"	"
6	Pacar Kembang Utara	14 Ha	6,440	1980 - 1981	KIP Urban III
7	Patemon Timur	22 Ha	7,700	"	"
8	Pacar Kembang Tengah	25 Ha	12,125	"	"
1	Banyuurip Timur	43 Ha	13,330	1981 - 1982	KIP Urban III
2	Krembangan Utara	11 Ha	5,885	"	"
3	Keputran	17 Ha	6,970	"	"
4	Pateman Barat	24 Ha	8,040	"	"
5	Simokerto	18 Ha	18,000	"	"
6	Ngagelrejo Barat	24 Ha	8,040	"	"
7	Pacar Kembang Selatan	17 Ha	5,865	"	"
8	Rangkah Barat	18 Ha	6,660	"	"
9	Gubeng	24 Ha	16,080	"	"
10	Jagir	27 Ha	13,770	"	"

Table 4.3.5 YEARLY PROGRAM FOR KIP IMPLEMENTATION

No.	Budget Year	No. of Kampung	Area (Ha)	Population	Road Length (M')	Foot Path (M')	Drainage (M')	Sewage (M')	Bridge for Vehicles (No.)	Pedestrian Bridge (No.)	Comm. Health Center (No.)	Primary Sch. (No.)	Clinic (No.)
1.	1976/1977	3	67	37,723	3,258	2,055	3,277	221	-	1	1	3	2
2.	1977/1978	6	125	94,851	5,431	12,935	5,553	263	6	2	2	4	-
3.	1978/1979	9	249	136,450	16,344	30,330	12,809	1,622	15	17	2	3	-
4.	1979/1980	10	185	76,900	6,337	24,558	4,079	1,083	7	14	-	1	-
5.	1980/1981	8	192	60,070	6,767	27,124	7,743	1,514	6	13	2	1	-
6.	1981/1982	9	235.50	85,756	11,470	28,165	8,324	1,682	12	10	1	-	-
	TOTAL	45	1053.50	491,744	49,600	125,167	41,785	6,385	46	57	8	12	2

Source : DATA PROYEK PERBAIKAN KAMPUNG URBAN II, III (FEBRUARY 1982)
- BAPPEN KIP URBAN III KOTAMADYA BATE II SURABAYA.

CHAPTER



EVALUATION OF DEVELOPMENT POTENTIAL

5.1 SOCIO-ECONOMIC POTENTIAL

5.1.1 PRODUCING CAPACITY

The potential for development mainly depends on two factors. The first is the level of production power consisting of production factors and infrastructure in the region. The second is market conditions to stimulate production activities from the demand side. For both, productivity is decided by manpower, capital, resources and land. Several features of the productivity of Surabaya City and GSK Region are shown in Table 5.1.1 and they are also compared with DKI Jakarta and Indonesia.

POPULATION AND MANPOWER

Population as the source of labour, is one of the more important factors to facilitate economic growth. The province of East Java has the largest population amongst all the provinces in Indonesia.

In 1980, it represented 21% of the population of Java and 6.1 million is located in GKS Region with 2.0 million concentrated in Surabaya City. As the table shows, the rate of population increase of the GKS Region is slightly less than that of Indonesia as a whole. On the other hand, Surabaya City shows a considerably high rate of population growth compared with GKS Region and Indonesia. This means that Surabaya City will have more abundant manpower resources through urban concentration of population.

Table 5.1.1 COMPARISON OF PRODUCING CAPACITY WITH OTHER REGIONS

	Surabaya City	(GKS Region)	DKI Jakarta	Indonesia
(1) Population Growth Rate (1980/1971 Average Annual) (%)	2.85	2.16	3.93	2.39
(2) Number of Junior High School and Senior High School (per 1,000 person) 1980	0.163	0.096	0.141	0.091
(3) Export and import Volume of main port (Per Area)(100 t /km ²) 1980	8.24	0.42	19.65	0.06
(4) Road Extension (per area) (km/km ²) 1980	1.96	0.42	5.09	0.07
(5) Per Capita Accumulated Investment (1968 - 1980)	Domestic (mil. RP/1,000)	133.9	108.5	46.7
	Foreign (mil. US\$/1,000)	0.105	0.062	0.186

Sources : 1) National Census
2) Provincial Income in Indonesia
3) Study team estimation and other statistics

For the development of the study area, the following points are important: --

The first is making the most use of the abundant manpower as a production factor. With limited demand for unskilled & uneducated labour it is necessary to increase the quality of labour through various kinds of education facilities as well as enlarging job opportunities by introducing new industries.

As shown in Table 5.1.2, the educational level of labour in East Java is low as a whole. The production potential of the study area can be increased by raising the level of knowledge and technology of the newly increased population.

Another important point on the population increase is that the ratio of employments to population in the study area and also the whole Indonesia, is considerably lower than those in Europe, U.S.A and Japan. Only if job opportunities are enlarged will this ratio rise and the increased labour force will accelerate economic growth. Adequate employment policies are necessary for the ordered progress of the study area.

Table 5.1.2 EDUCATED LEVEL OF LABOUR FORCE BY INDUSTRIAL SECTOR IN EAST JAVA

Education level	Primary Sector	Secondary Sector	Tertiary Sector	Total
Non Education	7,565,745 (85.3)	581,457 (68.9)	1,868,865 (62.9)	10,016,067 (79.0)
Graduation of Primary School	1,183,361 (13.3)	197,056 (23.3)	613,910 (20.6)	1,994,327 (15.7)
Graduation of Middle High School	62,987 (0.7)	38,713 (4.6)	224,822 (7.6)	326,522 (2.6)
Graduation of High School	19,908 (0.2)	25,010 (3.0)	215,694 (7.3)	260,612 (0.2)
Graduation of College & University	1,207 (0.4)	2,262 (0.03)	81,970 (0.6)	35,439 (0.4)
No evidence	32,609 (0.4)	263 (0.03)	18,337 (0.6)	51,209 (0.4)
Total	8,865,817 (100.0)	864,761 (100.0)	2,973,508 (100.0)	12,684,086 (100.0)

SOURCE; Statistik, Jawa timur 1980.

NOTES; The persons dropping out of the school are included into the former level education

OTHER FACTORS

Besides labour force, an important factor for development potential is the accumulation of social and private capital. Surabaya Port, as the main port of East Java, is expected to be an important factor in the development of GKS Region and Surabaya Metropolitan Area.

The volume of export and import cargo dealt with in Surabaya Port is now only 2% of the national total but the volume of the cargo is expected to increase in accordance with the industrialization of the study area. If the facility of Surabaya Port is enlarged in addition to industrialization, new industries such as transportation services and warehousing will be induced and these will supply new job opportunities to the surrounding area.

The density of roads in Surabaya City is less than DKI Jakarta. Since roads are the most essential social capital investment for industrial and social activities, higher priority has to be given to the arrangement of roads.

An important factor for development potential is the accumulation of social and private capital. Per capita accumulated volume of the approved domestic and foreign investment, the indicator of which means the level of capital formation, in Surabaya City (as well as GKS Region) is considerably larger than that of the whole of Indonesia. However, taking account not of only the foreign investment, the level of capital formation of Surabaya and GKS is lower than that of DKI Jakarta.

Industrialization is the most effective way to raise regional income. To raise the productivity of the industrial sector, it is necessary to confine the adequately abundant labour force to capital equipment. From the above points, it is recommended to facilitate investment in the study area through all possible ways.

5.1.2 CHARACTERISTICS OF THE MARKET

For evaluating the potential for economic growth, it is necessary to take the characteristics of the market into consideration, as well as its production capacity. General economic growth is brought about not only by supply side factors but also by demand

site factors.

The several profiles in the market of Surabaya City and GKS Region are shown in Table 5.1.3, compared with DKI Jakarta and the whole country. The degree of market maturity is analyzed through three indicators.

Estimated per capita GRDP of Surabaya City is about 1.5 times of the whole country, but significantly less than that of DKI Jakarta.

Share of non-primary sector GRDP is often used to show the degree of modernization and urbanization of the region. Based on this indicator, Surabaya City is almost as equally modernized as DKI Jakarta, and GKS Region is more developed than the whole country. However, third indicator, per capita passenger car, shows that DKI Jakarta is in a prominent position and this is also the case for per capita GDP.

The Study Team can conclude from these facts that Surabaya City and GKS Region are inferior to DKI Jakarta in market maturity. In a developing economy, the more the market matures the higher is the rate of economic growth. In the past the average annual growth rates of GRDP of Surabaya City and GKS Region are not only lowest than DKI Jakarta, but also lower than that of the whole country. Therefore, in the study area it is recommended to adopt an active development policy in order to accelerate economic growth.

Table 5.1.3 COMPARISON OF MARKET CHARACTERISTICS WITH OTHER REGIONS

		Surabaya City	(GKS Region)	DKI Jakarta	Indonesia
The Degree of Market Maturity	Per Capita GRDP 1980 (1000 Rp/Person, 1975 Price)	181.3	105.2	246.0	123.1
	Share of Non-Primary Sector GRDP (1978) (%)	94.4	74.9	97.9	66.9
	Number of Passenger car (per 1,000 person) 1980	1.98	0.72	3.40	0.04
Average Annual Growth Rate (%)	Population (1980/1971)	2.85	2.16	3.93	2.39
	GRDP (1980/1975) (Const. price)	5.2	4.4	9.06	7.5
	Secondary Sector GRDP (const. price) (1978/1975)	8.5	11.1	13.0	10.5

SOURCES : 1) National Census
2) Provincial Income in Indonesia
3) Study team estimation, and other statistics.

5.2 SPATIAL AND PHYSICAL POTENTIAL

5.2.1 DISTRIBUTION OF RESOURCES

MINERAL RESOURCES

According to the information from the annual report 1982/1983 of B.K.P. M.D. (Regional Investment Coordinating Board), the distribution of mineral resources is as shown in Fig. 5.2.1.

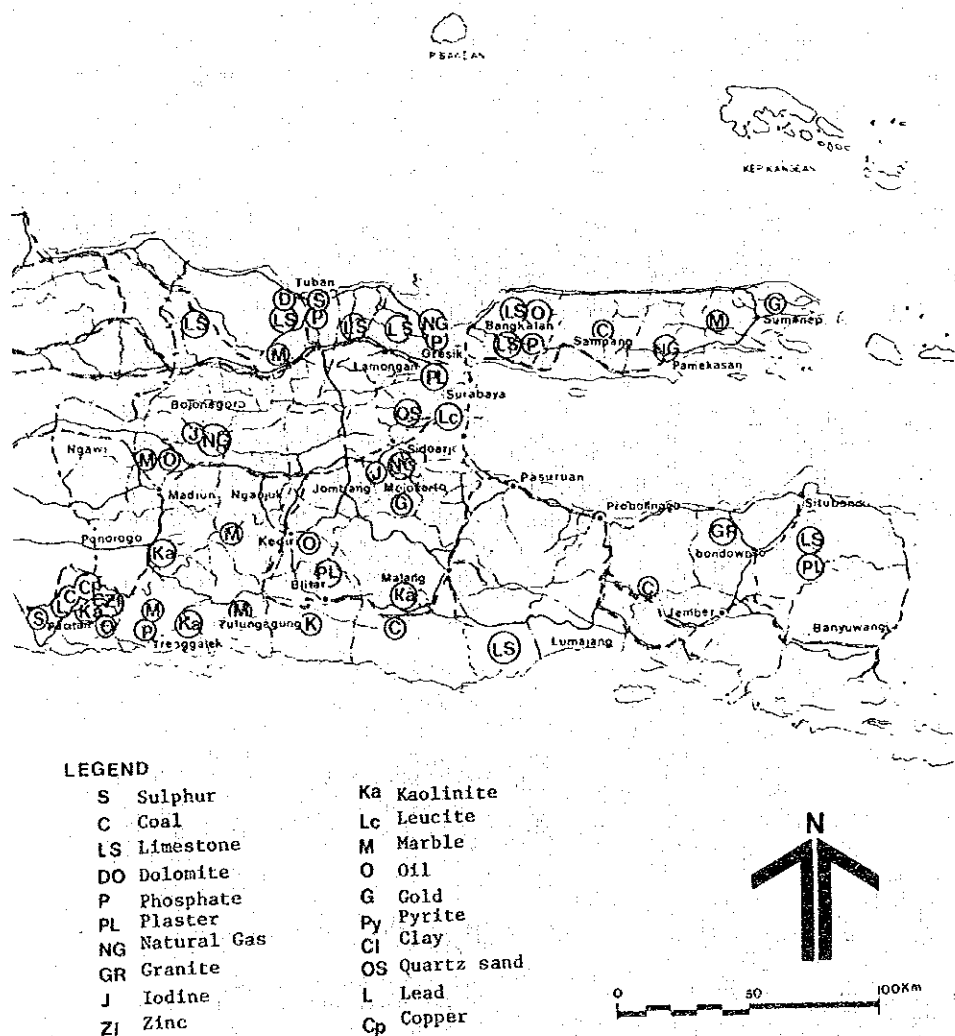


Fig. 5.2.1 MAIN MINERAL DEPOSITS IN EAST JAVA

The main resources deposited in East Java are limestone, copper and zinc.

In particular, the northern part of East Java, including the Study Area and Madura, possesses numerous deposits of limestone, and the development potential for cement manufacture is high.

In Pacitan located in the south-east of East Java, there are copper deposits capable of 500 ton per day output and zinc deposits also of 500 ton per day output.

AGRICULTURAL PRODUCTS

Main agricultural products are as shown in Fig. 5.2.2. Maize, copra, beans, coffee, tobacco and peanut cakes products are the main commodities for export through Tg. Perak port.

In the Study Area, sugarcane in Mojokerto and Sidourjo, and beef in Bangkalan are noteworthy products.

LEGEND

- | | | | |
|------|-----------|------|--------|
| (S) | Sugarcane | (To) | Tea |
| (Cl) | Coffee | (Ca) | Cocoa |
| (K) | Kapoc | (R) | Rubber |
| (F) | Fibre | (B) | Beef |
| (T) | Tobacco | (C) | Cashew |
| (Co) | Coconut | | |

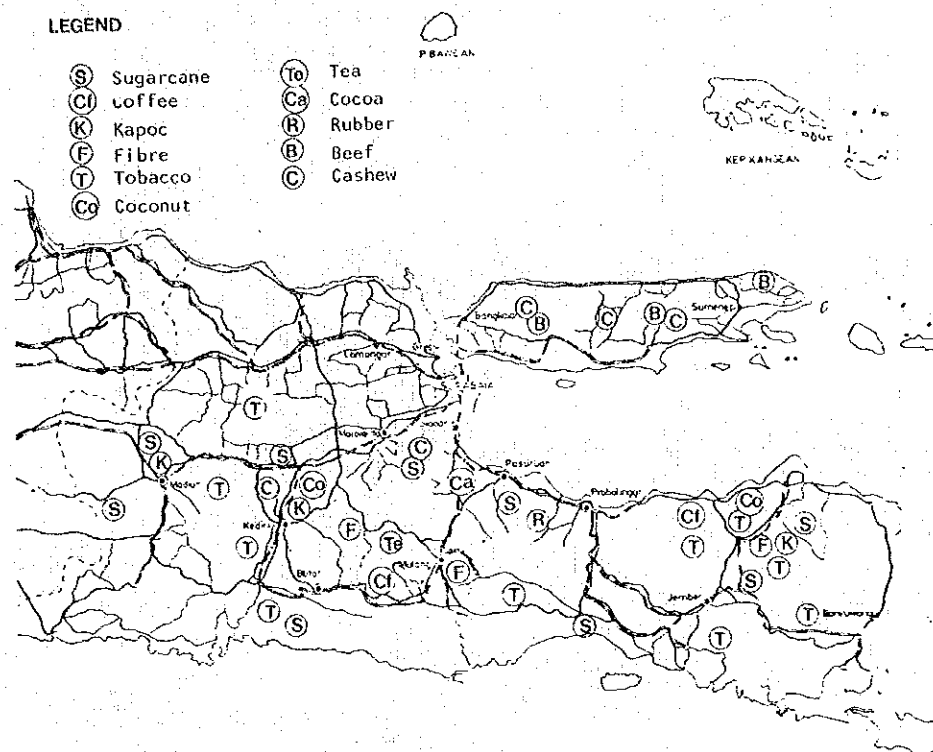


Fig. 5.2.2 MAIN AGRICULTURAL PRODUCTS IN EAST JAVA

5.2.2 LAND PRODUCTIVITY IN GKS REGION

As mentioned in the section 2-3, the Study Area is an advanced agricultural area. Taking note of rice production, the land productivity in GKS region was evaluated and the production per hectare cultivated by each Kecamatan is shown in Fig. 5.2.3.

As is evident from this figure, Mojokerto and Sidourjo are most advanced and their productivity of more than 8 ton/ha is considered to be a very high level. Lamongan and Bangkalan possess comparatively low productivity.

5.2.3 COMPREHENSIVE EVALUATION FROM PHYSICAL FACTORS

The development potential for urbanization was evaluated by the existing physical conditions.

The Study Team derived the factors to be used such as nature, agricultural investment/irrigation, land use, accessibility, etc. for the potential evaluation of land and applied the Mesh Method (1 km x 1 km) for the area centered in Surabaya.

The evaluation results are the basis for selecting the area applicable for urban development and for forecasting the variation/distribution of area development.

METHODOLOGY

(1) Analysis Area

The area analyzed covers 36 km in the east-west axis and 60 km in the north-south, centered on Surabaya. The area is divided into a 1 km x 1 km grid on the geological maps of scale 1 : 100,000.

(2) Evaluation-Ranking Factors

The evaluation factors are classified into two categories, constraint factors and promotion factors, to the urban development. A total of 7 factors are input for each block as described below:

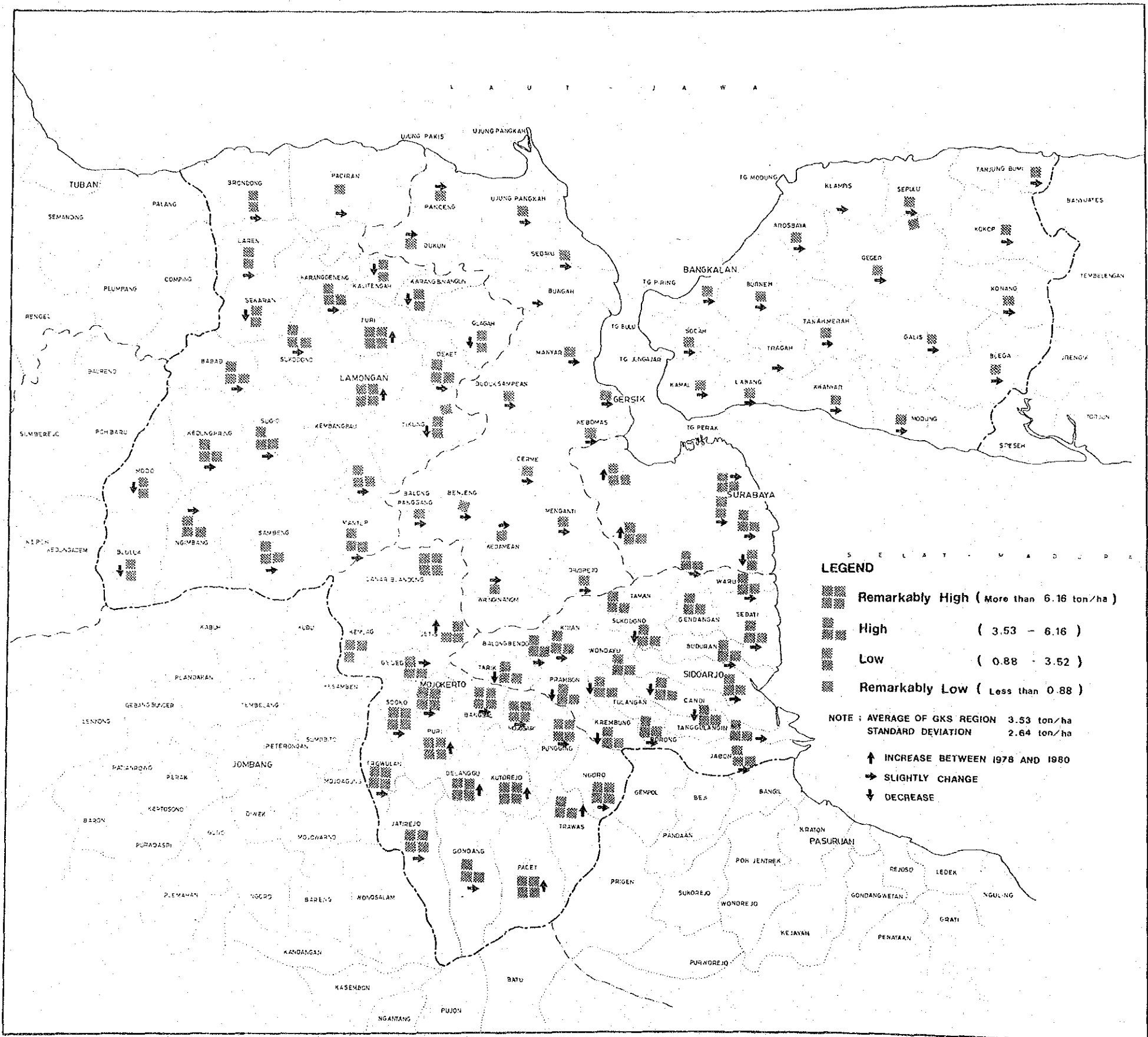


Fig. 5.2.3 LAND PRODUCTIVITY (AGRICULTURAL PRODUCTS PER HECTARE CULTIVATED)

– Constraint factors

The following 4 categories are the constraint factors of urbanization.

A. Natural constraint – I

Swampy and flooding areas are the indicators in this category.

B. Natural constraint – II

Terrain condition is the indicator in this category.

C. Agricultural investment

The Ministry of Agriculture classifies three categories of irrigation; Teknik, 1/2 Teknik and Non-Teknik. These categories express the past investment in the agricultural land and are the indicators for the advancing stage of agricultural development.

D. Land use

Five types of land use are the indicators in this category. They are existing city area, village, un-used land, agricultural land and river/fish pond.

– Promotion factors

The following three categories are regarded as the promotion factors of urbanization.

E. Infrastructure

The road influence corridor is the indicator of this category. Roads are classified into three classifications by the Ministry of Public Works. The influence corridors of arterial, collector and local are assumed to be 2 km, 1 km, and 1 km, respectively. A lower class of road than the local road is assumed to influence an area of 0.5 km from the road.

F. Accessibility from/to CBD & Tg. Perak

The CBD and Tg. Perak are the central functions in Surabaya. The access time by car between each block and the CBD/Tg. Perak is regarded as an indicator.

G. Accessibility from/to Juanda Airport

The airport is also an important regional function and is located in the suburbs of Surabaya. The access time by car between each block and the airport is regarded as an indicator.

The travel speeds for the above two factors B and C were assumed to be 25 km/hr for busy areas, 40 km/hr for arterial road, and 30 km/hr for the roads classified as local road or lower.

The land-price and social factor (population, etc.) are omitted from this evaluation. This potential evaluation is not the individual evaluation for specific land use, but rather a global or overall evaluation of the area. For this purpose the factors to be used should be basic and fundamental and not indirect factors derived through actual social activities. The land price is the result of social (business) activities and the accumulation of population is also the combined result of physical/spatial/location conditions, etc.

(3) Ranking of Indicators

All blocks are evaluated by the seven factors as described above. Each factor is classified by 5 ranks and individual score ranked from 1 to 5 is given to each block. If the land condition has less constraints and high promotion for urbanization, the overall score will be high and this indicates that the land block has a high potential for urbanization. The ranking of each evaluation factor is shown in Table 5.2.1.

Table 5.2.1 EVALUATION FACTOR AND SCORE FOR URBANIZATION

CODE NO.	EVALUATION FACTOR	SCORE				
		1	2	3	4	5
A	Natural Constraint - (I)	Swamp/Flooding	-	Occasional Flooding	-	No Restraint
B	Natural Constraint - (II) (Land Slope)	15-40°	-	2-15	-	0-2
C	Agricultural Investment	Teknik	1/2 Teknik	Non Teknik	-	-
D	Land Use	River/pond	Agricultural Land	Non-use	Village	Existing set-up Area
E	Infrastructure	No Road	Smaller than Local Road	Local Road	Collector Road	Arterial Road
F	Urban Activity - (I) (CBD & Tg. Perak)	More than 75 min.	60-75	45-60	30-45	Less than 30 minutes
G	Urban Activity - (II) (Juanda Airport)	More than 75 minutes	60-75	45-60	30-45	Less than 30 minutes

(4) Scoring Equation

Two equations were considered for the overall ranking as follows:

E-1 : Adopting only the constraint factors of A, B, and C.

$$R_1(i,j) = a \times F(A,i,j) + bF(B,i,j) + cF(C,i,j)$$

here, $R_1(i,j)$: Total score of the block (i,j) in the equation E-1

$F(A,i,j)$, $F(B,i,j)$, $F(C,i,j)$: Individual score of the block (i,j) in the factor A, B, C respectively.

a, b, c : Weighting factor

E-2 : Adopting all of the factors

$$R_2(i,j) = An \frac{\sum F(n,i,j)}{n}$$

here, $R_2(i,j)$: Total score of the block (i,j) in the Equation E-2.

$F(n,i,j)$: Individual score of the block (i,j) in the factor category (n).

An : Weighting factor for the category (n)

(5) Cases for Evaluation

Several cases were prepared for evaluation:

Case	Weight Factors	Adopted Equation
Case I	give 1 to all the factors	E-1
Case II	give 1 to all the factors	E-2
Case III	give 1 to the factors A to D, and give 2 to the factors E to G	E-2

(6) Evaluation Results

Fig. 5.2.4 to Fig. 5.2.6 shows the results for the three cases above.

Observing the distribution pattern of the blocks with a comparative high score, the following are noteworthy:

- In case I, the western area of Surabaya, the area around Gresik and Kamal area are evaluated to have high urban development potential.
- In case II, the corridor of Surabaya–Sidoarjo and the areas around Gresik, Waru are evaluated highly.
- In case III, the urban development potentials in three major corridors are comparatively high because of the high evaluation of the promotion factors such as infrastructure and accessibility to the central area.

Needless to say, the distribution of the high potential area for urban development is different in accordance with the cases.

Considering that the area with minimum natural constraint should be selected for urban development, the results of Case I will be good reference material. On the other hand, standing on the viewpoint that the promoting conditions should be emphasized more, then Case III gives the basis for consideration.

The Study Team adopts the results of Case II as a planning condition because of the intermediate characteristics of Case II.

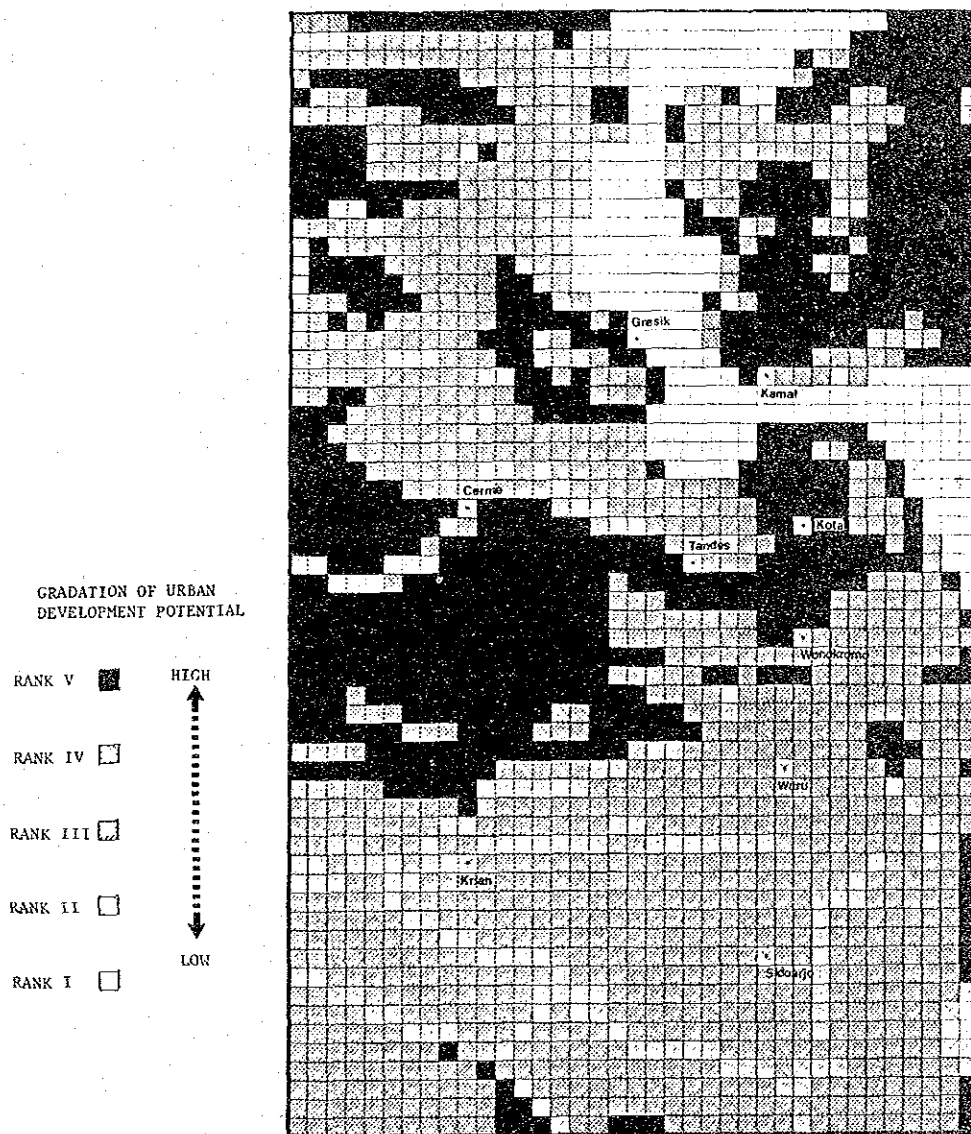


Fig. 5.2.4 EVALUATION OF URBAN DEVELOPMENT POTENTIAL (CASE I)

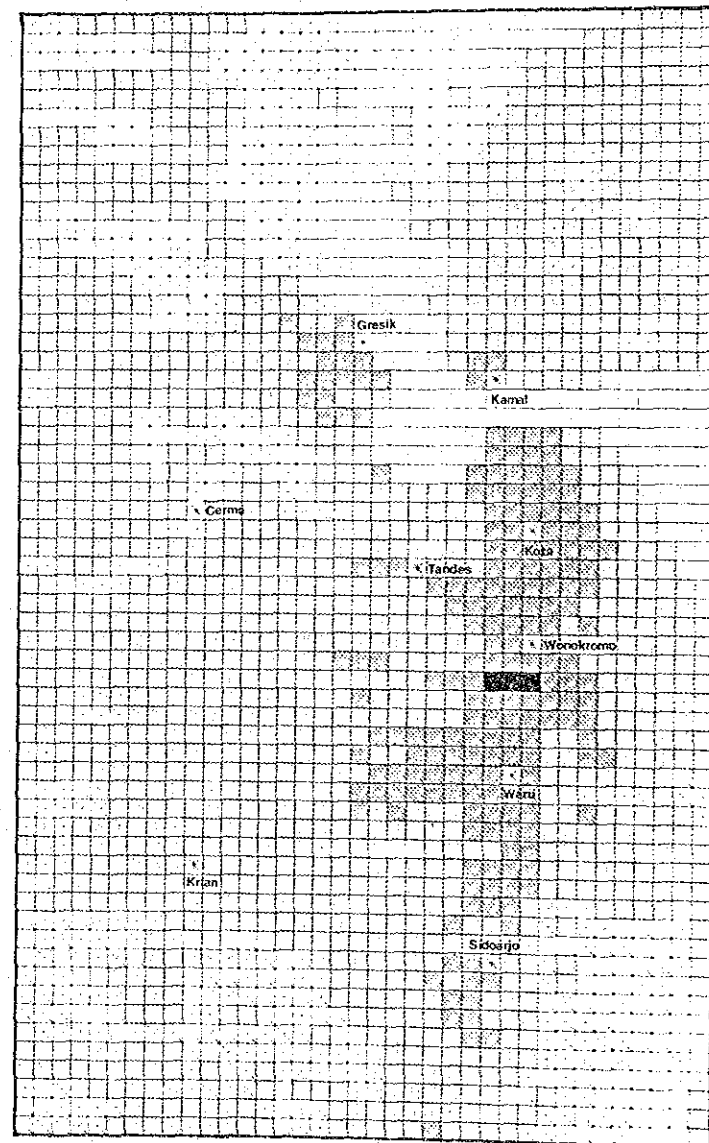


Fig. 5.2.5(1) EVALUATION OF URBAN DEVELOPMENT POTENTIAL (CASE II)

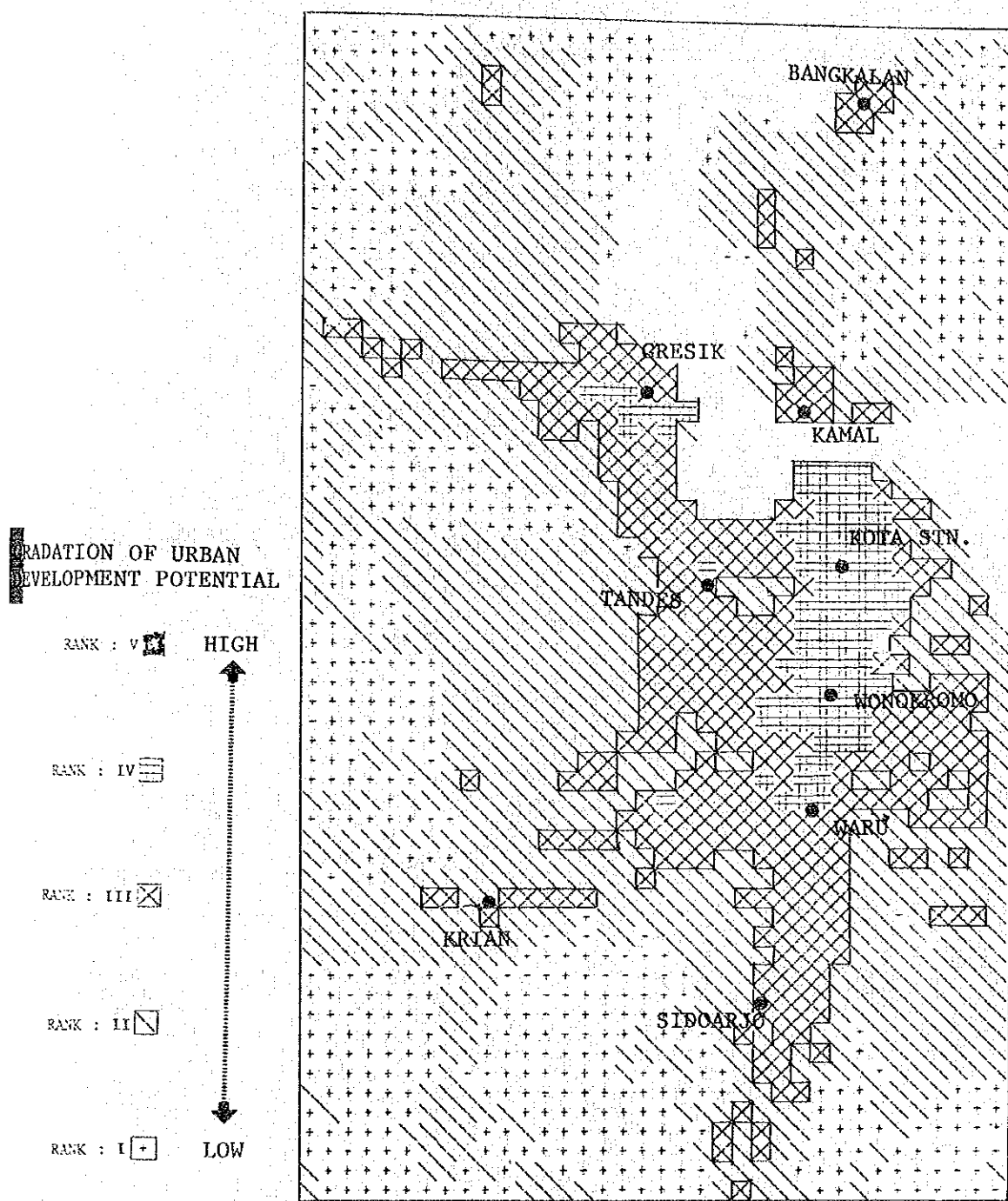


Fig. 5.2.5(2) EVALUATION OF URBAN DEVELOPMENT POTENTIAL (CASE II)

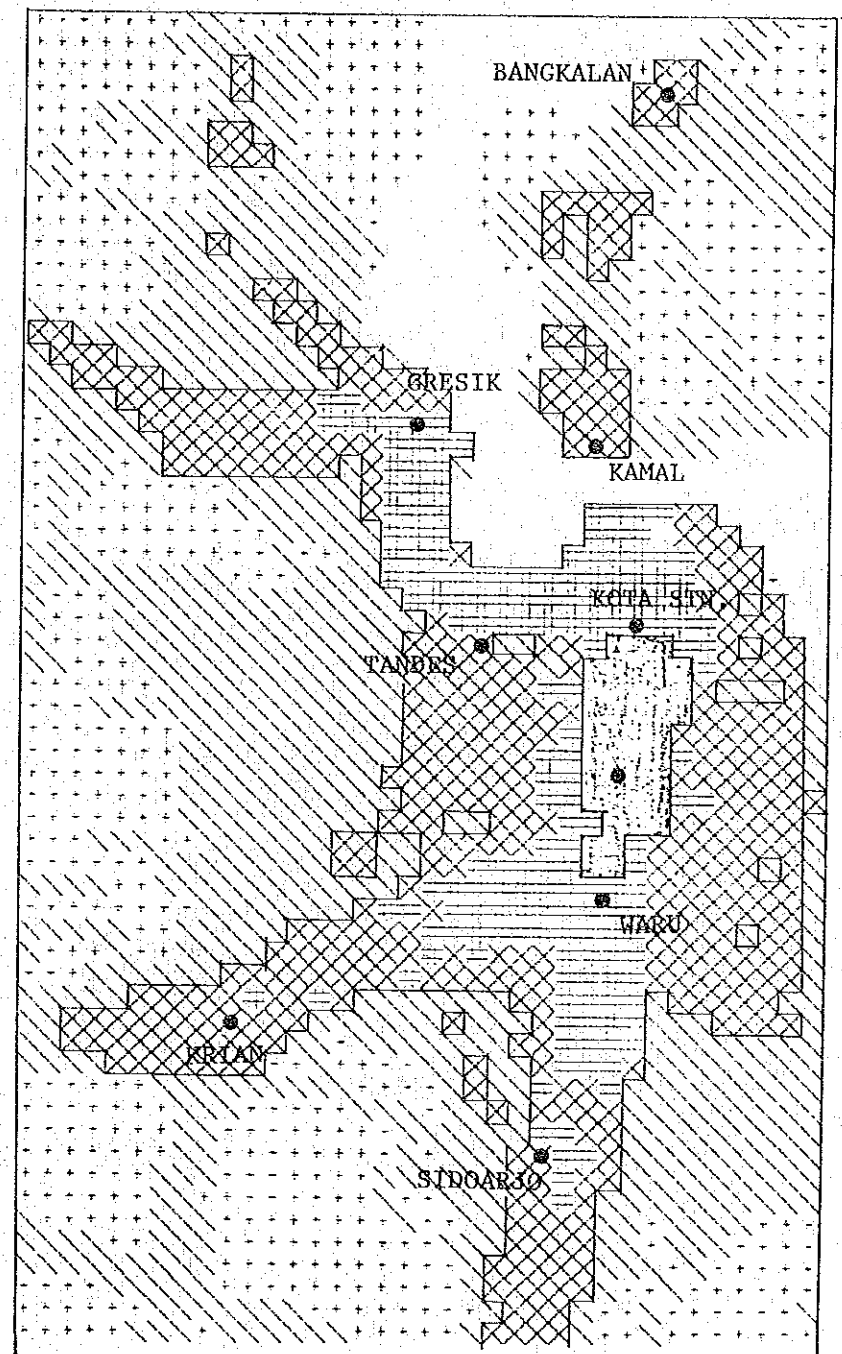


Fig. 5.2.6 EVALUATION OF URBAN DEVELOPMENT POTENTIAL (CASE III)

5.3 SUMMARY OF EXISTING PROBLEMS

The major problems in GKS Region derived from a series of analyses on existing conditions are summarized as follows:

SOCIO-ECONOMIC

- Concentration of population in the urban area
- Low level of per capita income
- Majority of low-income group
- Shortage of employment opportunities/increasing latent unemployments
- Low growth of General Regional Domestic Products
- Too big share of the tertiary sector in the industrial composition in Surabaya (73.0% GRDP Base)
- Shortage of skilled manpower supporting an industrial modernization.

INDUSTRIAL ACTIVITIES

- Low activity of industrial foreign investments.
- Undevelopment of suitable land for industrial locations,
- Undevelopment of industrial infrastructures to maximize the accumulation of commercial functions,
- Undevelopment of distribution system in freight,
- Low productivity of small-scale industry

LANDUSE AND URBAN STRUCTURE

- Spatial limitation of capacity caused by the existing radial pattern
- Undevelopment of major structures coping with an anticipated urban growth
- Functional confusion between commercial sector, manufacturing sector and housing.
- Housing sprawl without sufficient development of infrastructure
- Lowering the central function by traffic congestion and by inflow of passing-through traffic into the busy area
- Lack of total urban system by an undevelopment of secondary system

TRANSPORTATION

- Undevelopment of a transportation system coping with coming motorization society.
- Disorder of road using (Lack of functional classification) and of development in correspondent to functions)
- Existence of bottle-necks of industrial traffic
- Undevelopment of public transportation system, especially a lack of mass-transportation network system
- Congestion of bus terminals
- Low service level of bus transport
- Shortage of port handling capacity
- Insufficient capacity of parking lots
- Low capacity of ferry transportation between Surabaya and Karnal
- Undevelopment of distribution facilities and system
- Low capacity of Kali Mas Port

RIVER/UTILITIES, AND ENVIRONMENT

- Inundation of secondary river/canal system
- Water shortage and low service level
- No operation of waste water treatment system
- Low service level of solid waste management
- Severe water pollution in water way system and ground water