

## 10.4 ZONING SYSTEM

### (1) STRATEGIC DEVELOPMENT ZONES

Based on the study results of the existing landuse, the process of urban growth, the urban development potential and so on, the Study Team proposes 5 categories of strategic development zones;

- Zone—I : to encourage the wide regional centre function,
- Zone—II : to improve the living environment by area development,
- Zone—III : to establish the new development areas strategically,
- Zone—IV : to develop the sub-centres,
- Zone—V : to preserve open space and agricultural area and natural preservation areas.

### (2) INDUSTRIAL DEVELOPMENT ZONE

The zone to be developed actively for industrial area can be further classified into four types for characteristics of location;

- Coastal industrial zone (including port area)
- Airport industrial zone
- Inland industrial zone
- Urban location industrial zone

### (3) ZONING SYSTEM FOR CENTRAL AREA DEVELOPMENT

Major important policies are as follows;

- To regulate the parking control
- To set up the housing improvement districts
- To regulate the district to be redeveloped
- To regulate the port development district
- To regulate the preservation area

Major points of the above are summarized in Fig. 15.2.1.

## 10.5 STRUCTURE PLAN

Considering the desirable image beyond the year 2000, the Study Team proposes the physical structure plan for SMA in the year 2000, as shown in Fig. 15.2.2 and 15.2.3.

Specifications for the projects referred by the number shown in the figures are summarized in Table 15.2.1.

Fig. 15.2.1






Surabaya Metropolitan Area

# STRUCTURE PLAN


## ZONING SYSTEM

### LEGEND


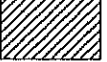

#### ZONING FOR URBAN DEVELOPMENT

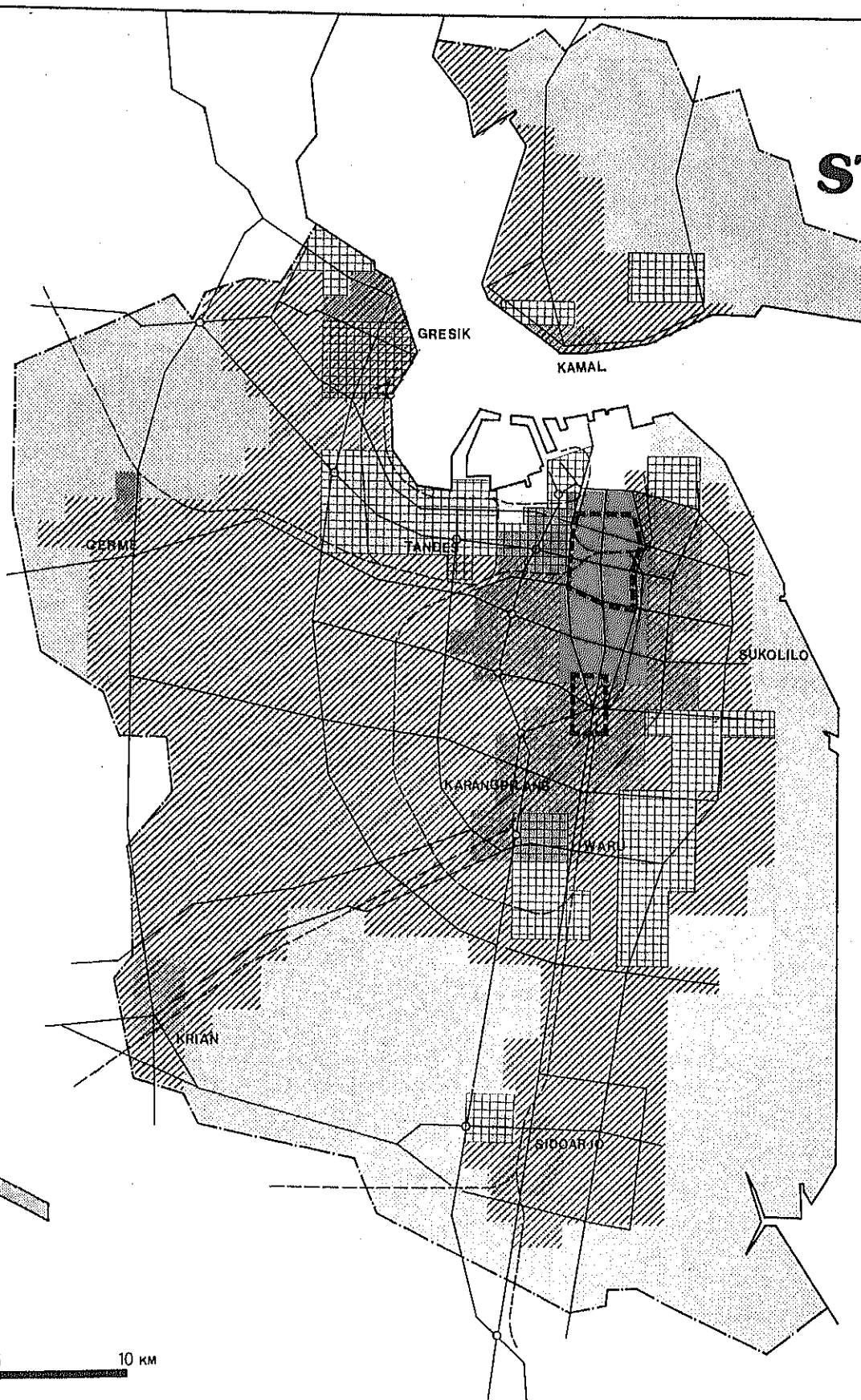
-  ZONE I TO ENCOURAGE THE WIDE REGIONAL CENTER FUNCTION
-  ZONE II TO IMPROVE THE LIVING ENVIRONMENT BY AREA DEVELOPMENT
-  ZONE III TO DEVELOP THE SUB-CENTER
-  ZONE IV TO ESTABLISH THE STRATEGIC AND INTENTIONAL DEVELOPMENT
-  ZONE V TO PRESERVE THE NATURAL AND AGRICULTURAL LAND FOR OPEN-SPACE

#### ZONING FOR TRAFFIC CONTROL

-  AREA PARKING CONTROL

#### ZONING FOR INDUSTRIAL DEVELOPMENT

-  ZONE A WHERE INDUSTRIAL DEVELOPMENT IS ENCOURAGED
-  ZONE B WHERE INDUSTRIAL DEVELOPMENT IS CONTROLLED
-  ZONE C WHERE INDUSTRIAL DEVELOPMENT IS RESTRICTED



URBAN DEVELOPMENT PLANNING STUDY ON GERBANGKERTOSUSILA  
(SURABAYA METROPOLITAN AREA)



Fig.15.2.2

Surabaya Metropolitan Area

# STRUCTURE PLAN KEY DIAGRAM



## LEGEND

### URBAN USE

	RESIDENTIAL		EXISTING VILLAGE
	INDUSTRIAL		FUTURE EXPANSION / RESERVATION
	MINERAL WORKING		SHOPPING
	MAJOR ACTIVITY CENTER		ACTIVITY CENTER
	PORT/DISTRIBUTION		FUTURE EXPANSION
	MAJOR HOSPITAL		HIGH EDUCATIONAL (UNIVERSITY)
	VOCATIONAL SCHOOL		RECREATIONAL
	WATER WORKS		PARK OR OTHER OPENSACE
	SEWAGE DISPOSAL WORKS / SOLID WASTE DISPOSAL WORKS		

### COMMUNICATIONS

	TOLLWAY (EXISTING PROJECTION)		SECONDARY ROAD
	PRIMARY ROAD		SECONDARY ROAD
	GRADE SEPARATION (INTER-SECTION)		RAILWAY (PASSENGER)
	RAILWAY (PASSENGER)		RAILWAY (FREIGHT LINE)
	PASSENGER MAIN STATION		OTHER STATION
	BUS TERMINAL		RAILWAY RELEVANT FACILITIES
	FREIGHT TERMINAL		OTHER FREIGHT GENERATOR
	AIR PORT		FERRY PORT

### POLICIES

	NATURAL CONSERVATION		ACTION AREA
	AGRICULTURAL PRESERVATION		
	OPEN SPACE / GREEN		

### EXTENT OF THE PLAN

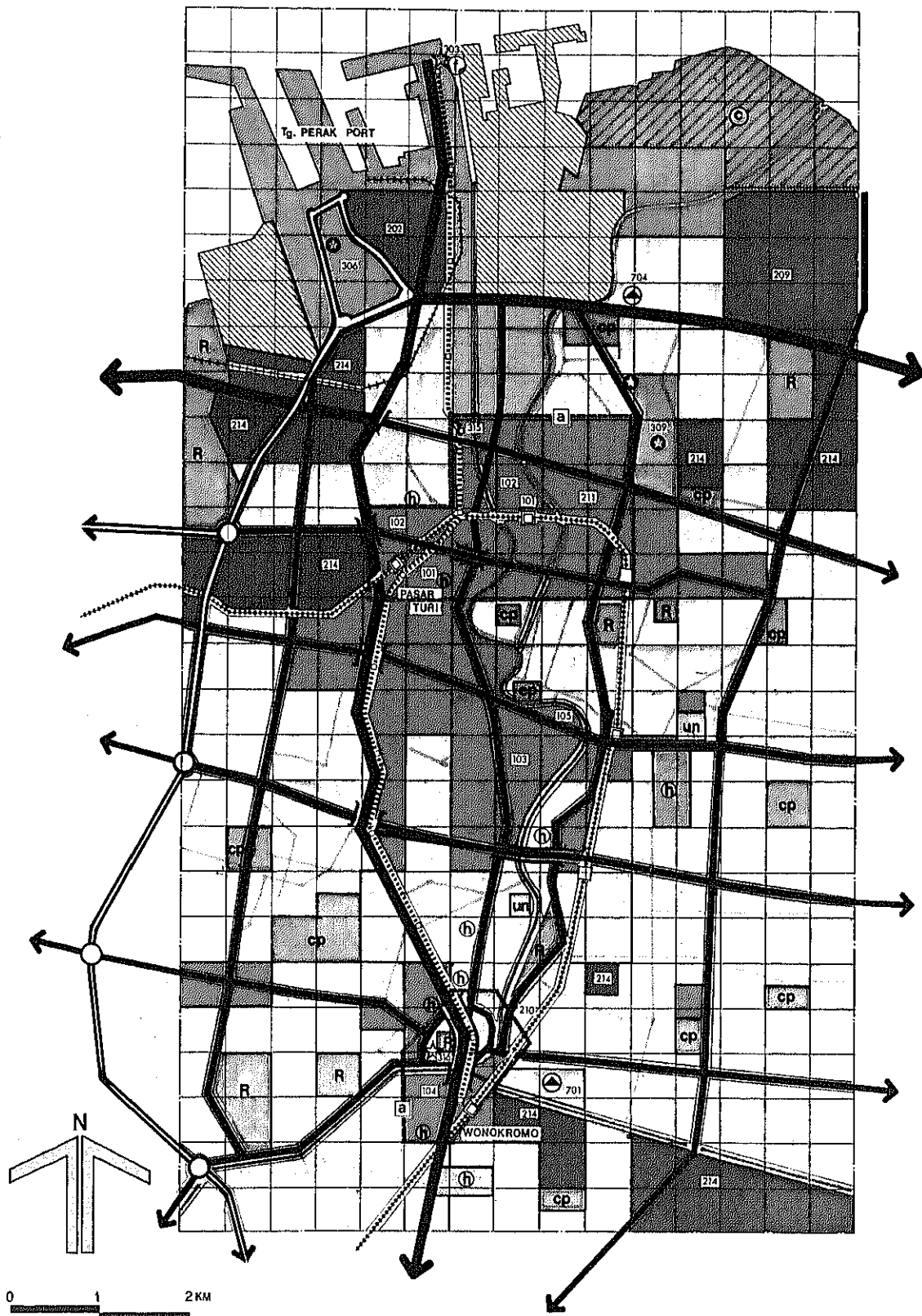
	BOUNDARY OF URBAN STRUCTURE PLAN
	CENTRAL AREA INSET

URBAN DEVELOPMENT PLANNING STUDY ON GERBANGKERTOSUSILA  
(SURABAYA METROPOLITAN AREA)















Fig. 15.2.3

Surabaya Metropolitan Area  
**STRUCTURE PLAN**  
**KEY DIAGRAM**  
**(CENTRAL AREA)**
















**LEGEND**

**URBAN USE**

-  COMMERCIAL
-  BUSINESS & HOUSING
-  HOUSING
-  INDUSTRIAL
-  WAREHOUSES
-  PORT/DISTRIBUTION
-  MAJOR HOSPITAL
-  HIGH EDUCATIONAL
-  RECREATIONAL
-  PARK OR OTHER OPEN SPACE
-  MILITARY
-  WATER WORKS

**COMMUNICATIONS**

-  TOLLWAY (EXISTING PROJECTION)
-  PRIMARY ROADS
-  SECONDARY ARTERIAL STREETS
-  EXISTING STREETS
-  GRADE SEPARATION INTER-SECTION
-  RAILWAY (PASSENGER & FREIGHT LINE)
-  RAILWAY (FREIGHT LINE)
-  NEW TRANSIT SYSTEM
-  PASSENGER MAIN STATION
-  OTHER STATION
-  BUS TERMINAL
-  FREIGHT GENERATOR
-  FERRY PORT

**POLICIES**

-  NATURAL CONSERVATION
-  OPEN SPACE/GREEN
-  ACTION AREA

URBAN DEVELOPMENT PLANNING STUDY ON GERBANGKERTOSUSILA  
 (SURABAYA METROPOLITAN AREA)



Table 5.2.1 OUTLINE OF DEVELOPMENT PROJECTS PROPOSED  
IN THE STRUCTURE PLAN

IDENTIFICATION OF LOCATION	PROJECT	LOCATION	OUTLINE OF PROJECT	NOTES	
<u>COMMERCIAL DEVELOPMENT</u>					
101	Redevelopment of Central Business District (Paser Turi and Kota Area)	Surabaya	- Encouragement of Central Commercial and Wholesale Function. Area Clearance and Rebuilding of Commercial and Business Facilities. (Around 25 ha)	It is assumed that the public body pays the development cost of relevant public facilities such as road expansion, parking space and utilities, and that the building cost is basically financed by the private sector.	
102	Improvement of Wholesale and Distribution Area	Surabaya	- Development of Warehousing and Wholesale area, including Road Expansion (about 3 km), Relocation of Warehouses, Land Adjustment, and Parking Areas.		
103	Improvement of Central Shopping Area	Surabaya	- Development of Shopping Environment by Street Improvement, Parking Lots Development and Tree Planting (along the major street, 4 km)		
104	Redevelopment of Central Business District (Sub-Urban Heart Development in Wonokromo)	Surabaya	- Area clearance and Rebuilding of Commercial and Business Facilities. (About 20 ha) - A drastic re-organization of inter-section is included in the context of this project.		Same as 101.
105	Development of Commercial Functions Around Railway Station, Gebung.	Surabaya	- Formation of Shopping and Business Core using the unoccupied land in front of Sta. Gebung.		
106	Encouragement of Major Activity Centers	Sidoarjo, Krian, Gresik, Kamal	- Renewal, Redevelopment and Improvement of the Built-up Industrial, Commercial and Residential Areas, including Parking Lot.		
107	Encouragement of Other Activity Centers	Waru, Karangpilang, Tandes, Cerme	ditto		
<u>INDUSTRIAL DEVELOPMENT</u>					
201	Port Area Expansion Project	Surabaya - Gresik	- Encouragement of Port Function in correspondence with future demand, including cargo distribution terminal, warehouses, industrial complex and so on.	Beyond the year 2000	
202	Tg. Perak Port Supporting Area Development Project	Surabaya	- Development of Industrial Estate, Container yard, Distribution Facilities, Common Service Facilities and so on. (about: 250 ha)	Redevelopment and relocation of the existing houses is needed.	
203	Development of Tandes Industrial Complex	Tandes	- Industrial Estate for Middle and Large Scale Factories relating with the Port function (about 600 ha)		
204	Development of Waru Industrial Complex	Waru	- Industrial Estate for Middle and Large Scale Factories suitable for inland location (about 300 - 400 ha)		
205	Expansion of Rungkut Industrial Estate	Rungkut	- Industrial Estate for Middle and Small Scale Factories centering on the SIER. - Development of Infrastructures for industrial activities.		
206	Development of Sidoarjo Industrial Estate	Sidoarjo	- Industrial Estate for Middle and Small Scale Factories relating with the Sidoarjo Inter-change. - Activation of Industrial landuse development around the Inter-change.		
207	Development of Industrial Infrastructure in Gresik Coastal Area	Gresik	- Reclamation for new industrial location and Development of Infrastructures for industrial activities.		
208	Development of Industrial Foundation in Karangpilang area	Karangpilang	- Encouragement of the existing industrial activities - Development of Roads and Utilities and Land Adjustment - Environment Development by Tree Planting etc.		
209	Development of Cewek Industrial Estate	Surabaya	- Industrial Estate for Middle and Small Factories relating with the Port Function by land reclamation and adjustment.		



IDENTIFICATION OF LOCATION	PROJECT	LOCATION	OUTLINE OF PROJECT	NOTES
210	Industrial Relocation in Ngagel Area	Surabaya	- Promoting a relocation programme of the existing timeworn factories. - Utilization of the land produced by the relocation.	
211	Industrial Relocation in Kota Area	Surabaya	ditto	
212	Development of Large Scale Cement Factory	Kamal	- PT. CEMEN MADURA (around 400 ha)	On-going project
213	Development of Industrial Foundation in Kamal Coastal Area	Kamal	- Development of Industrial land for inducement of new location, and of infrastructures	
214	Improvement of Industrial Environment and Renewal, Redevelopment and Improvement of the Built-up industrial area	SMA	- Development of infrastructure and land adjustment for inducement of new locations of the factories without industrial pollution.	
215	Future Expansion of Industrial Estate (Coastal Location)	Tandes	- Enlargement of the Tandes Industrial Complex developed, relating with the expansion project of the port, Tg. Perak.	Beyond the year 2000
216	Future Expansion of Industrial Estate (Airport-Side Location)	Sedati	- Reservation for the future development of Industrial Estate accepting the locations of Electron and Electric Manufacture.	
<u>FREIGHT/DISTRIBUTION TERMINAL</u>				
301	Relocation of Kali Mas Port and Redevelopment	Surabaya	- Relocation Programme of the Inter-Insular Port, Kali Mas Port to the Gresik Port. - Utilization of the land by Distribution Facilities such as Warehouses and Terminals	According to the existing programme
302	Development of the Gresik Port	Gresik	- Encouragement of the Gresik Port function by enlargement of the existing capacity and development of the relevant facilities as a major industrial port. - Enlargement of Ferry Transport Capacity.	
303	Development of the Surabaya Ferry Port	Surabaya	- Enlargement of the transport capacity as well as Improvement of the Wharf and the Relevant Facilities.	- To ensure this port as an important node of a major arterial road.
304	Development of the Kamal Ferry Port	Kamal	- Enlargement of the transport capacity as well as Improvement of the Wharf and the Relevant Facilities.	- Same as the Surabaya Ferry Port.
305	Development of the New Kamal Ferry Port	Kamal	- New Development of the Ferry Port linking with the Gresik Ferry Port	- To ensure this port as a major node of collector road.
306	Distribution Center Supporting Tg. Perak	Surabaya	- Development of Distribution Facilities Complex comprising Cargo Terminal, Container Yard, Warehouses, and Relevant Facilities.	- According to the existing programme.
307	Development of Tandes Cargo Terminal Complex	Tandes	- Distribution Facilities Complex comprising Truck Terminal, Warehouses, Market, Wholesalers Estate, Parking Lot of Trucks, Forwarding Companies Estate and Relevant Facilities. (around 60 ha)	- To function as a primary facilities in Cargo Distribution System.
308	Development of Waru Cargo Terminal Complex	Waru	- Same Function as Tandes. - A Distribution Center serving the southern areas	- ditto
309	Development and Enlargement of Sidotopo Cargo Terminal	Surabaya	- Encouragement of the existing terminal as one of secondary cargo terminals for intra-urban distribution and freight. - Utilization of the land produced by relocation of Railway Depot in the future as a major distribution center for an intra-urban freight.	- To adjust the development programme with the railway facilities development.
310	Development of Exclusive Industrial Port	Kamal	- Development by the Cement Factory located in Kamal.	- According to the existing programme.
311	Development of Local Markets and Distribution Centers for Agricultural Products	Waru, Sidoarjo, Krian	- The distributional connectors between the urban and the advanced agricultural hinterland.	
312	Tandes Inter-City Bus Terminal Development	Tandes	- The Major Bus Terminal for Inter-City Transport. The existing terminal, Jembatan Merah is to be relocated to this terminal.	- As a major connector between the city bus and the inter-city bus transportation.

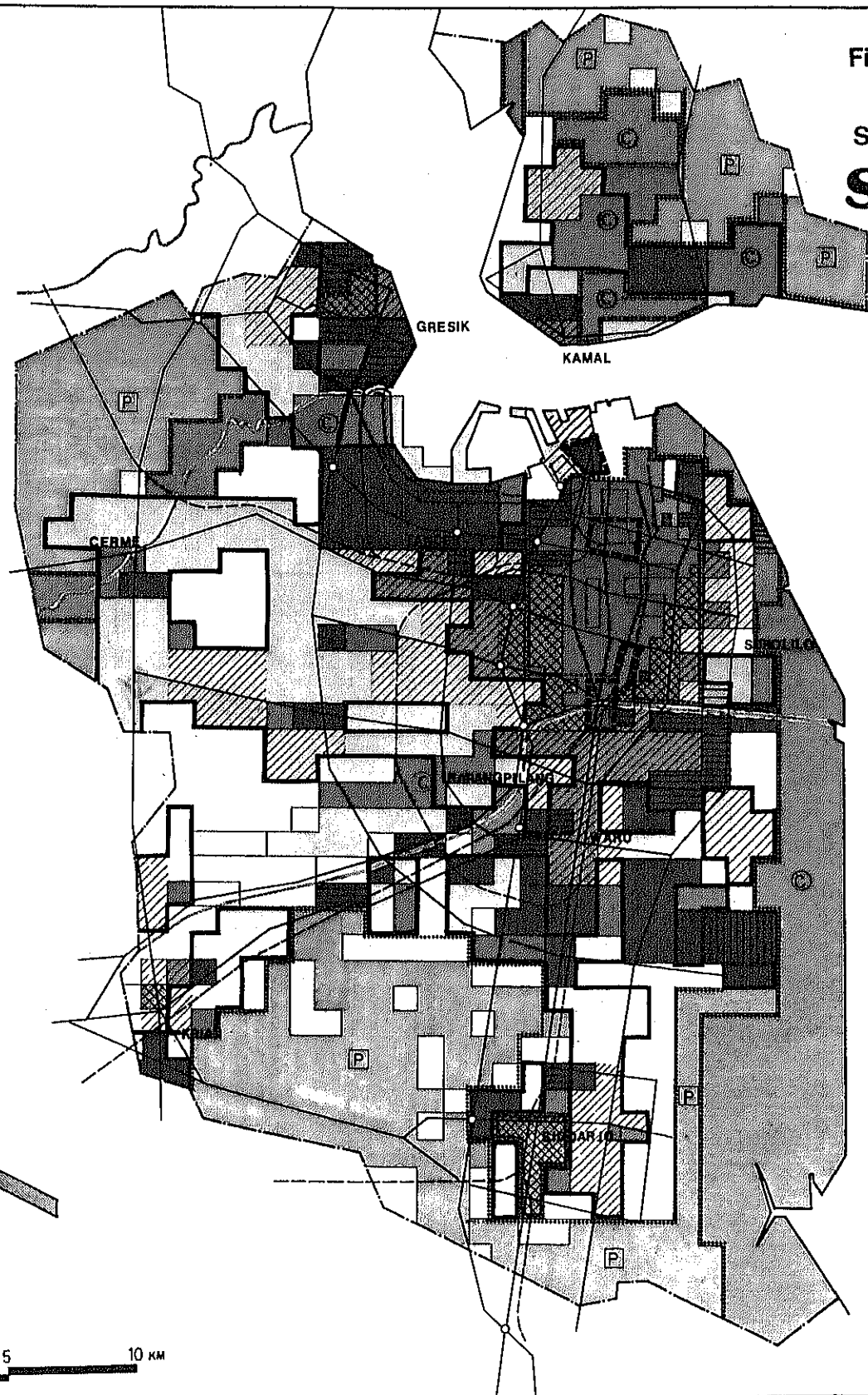
IDENTIFICATION OF LOCATION	PROJECT	LOCATION	OUTLINE OF PROJECT	NOTES
313	Waru Inter-City Bus Terminal Development	Waru	- Same Function as Tandes Bus Terminal integrating the existing function of Joyoboyo Terminal.	- Joyoboyo Terminal is to function as a major city-bus terminal.
314	Sukolilo Inter-City Bus Terminal Development	Sukolilo	- Same Function as Waru and Tandes and the Major terminal in the eastern area of Surabaya.	
315	Development of Station Park of New Transit Mode	Jumbatan Merah	- Development of a new transportation mode of New Transit Mode in the land produced by the relocation of the existing Bus Terminal. - Development of Community Park.	
316	Improvement of Joyoboyo Bus Terminal	Wonokromo	- To transfer the function of inter-city terminal to Waru Terminal developed and improvement as a major City-Bus Terminal.	
<u>RECREATION FACILITIES</u>				
501	Development in Sukoliro Area	Sukoliro	Agglomeration of Recreation Facilities comprising Sport Ground, Stadium and Large Scale Park.	
502	Development in Keaujerang Area	Keaujerang	Improvement and enlargement of the existing leisure facilities as a major Seaside Resort	
503	Development in the Port Side Area	Krebangan	A large scale Seaside Park utilizing the natural conditions such as pond and green.	
504	Development of the River Mouth of Kali Ramong Area	Gresik and Surabaya	Sport Facilities development in consideration of natural preservation.	
505	Development in Karangpilang Area	Karangpilang	Large Scale Natural Park consisting of Zoo, Botanical Garden, Leisure Facilities and so on.	
506	Development in Sidoarjo Area	Sidoarjo	Comprehensive Sport Park utilizing the existing facilities.	
507	Development in Cerme Area	Cerme	Natural Park in consideration of the preservation of River and Nature	
508	Development in Kamal Area	Kamal	Large Scale Resort Park as a core of tourism development.	
509	Development in Krian Area	Krian	Comprehensive Sport Park consisting of some sport facilities and green.	
510	Development in Waru Area	Waru	ditto	
<u>MAJOR PUBLIC FACILITIES (REGIONAL FUNCTIONS)</u>				
601	Encouragement of High Educational Facilities	Surabaya	- Enlargement of accommodation capacity and improvement of educational environment for the existing university.	
602	Development of Vocational School	Sukolilo	- Industrial Skills Training Center, managed by the National Government.	
603	Development of Major Hospitals	Surabaya Sidoarjo Gresik	- Encouragement of the existing hospitals so as to enable a comprehensive medical treatment	
<u>URBAN UTILITIES</u>				
701	Ngagel			
702	Development of Water Purification Plant	Gresik	Capacity of 840,000 m <sup>3</sup> /day	
703	Development of Water Purification Plant	Waru	Capacity of 516,200 m <sup>3</sup> /day	
704	Development of Water Reservoir (Tank)	Surabaya	Effective capacity of 78,000 m <sup>3</sup>	
705	Development of Waste Water Treatment Plant	Gresik	Max. Treatment Capacity : 305,000 m <sup>3</sup> /day	
706	Development of Water Reservoir (Tank)	Surabaya	Effective capacity of 139,300 m <sup>3</sup>	
707	Development of Water Reservoir (Tank)	Gresik	Effective capacity of 39,000 m <sup>3</sup>	
708	Development of Water Reservoir (Tank)	Sidoarjo	Effective capacity of 199,200 m <sup>3</sup>	
709	Development of Waste Water Treatment Plant	Kamal	Max. Treatment Capacity : 77,000 m <sup>3</sup> /day	
711	Development of Waste Water Treatment Plant & Incineration Plant	Tandes	Water Treatment Plant Max. Capacity : 553,000 m <sup>3</sup> /day Incineration Plant Capacity : 900 ton/day	
712	Development of Wastewater Treatment Plant	Surabaya	Max. Treatment Capacity : 500,000 m <sup>3</sup> /day	
713	Development of Wastewater Treatment Plant & Incineration Plant	Surabaya	Max. Treatment Capacity : 140,000 m <sup>3</sup> /day Incineration Plant Capacity : 600 ton/day	
714	Development of Wastewater Treatment Plant & Incineration Plant	Sidoarjo	Water Treatment Plant Capacity : 524,000 m <sup>3</sup> /day Incineration Plant Capacity : 600 ton/day	



Fig.15.2.4

Surabaya Metropolitan Area

# STRUCTURE PLAN DEVELOPMENT SCHEME



## LEGEND

### URBAN USE

EXISTING	FUTURE EXPANSION	
		COMMERCIAL & BUSINESS
		HOUSING
		VILLAGE
		INDUSTRIAL
		EDUCATIONAL
		RECREATIONAL/COMMUNITY PARK
		AIR PORT
		HARBOUR & RELEVANT FACILITIES

### HOUSING DENSITY

	HIGH DENSE RESIDENTIAL (MORE THAN 200 FRS/ha)
	MIDDLE (50-200 FRS/ha)
	LOW (LESS THAN 150 FRS/ha)

### POLICIES

	NEW DEVELOPMENT
	IMPROVEMENT
	REDEVELOPMENT / RELOCATION
	CONSERVATION
	AGRICULTURAL PRESERVACION

### EXTENT OF THE PLAN

	BOUNDARY OF URBAN STRUCTURE PLANNING
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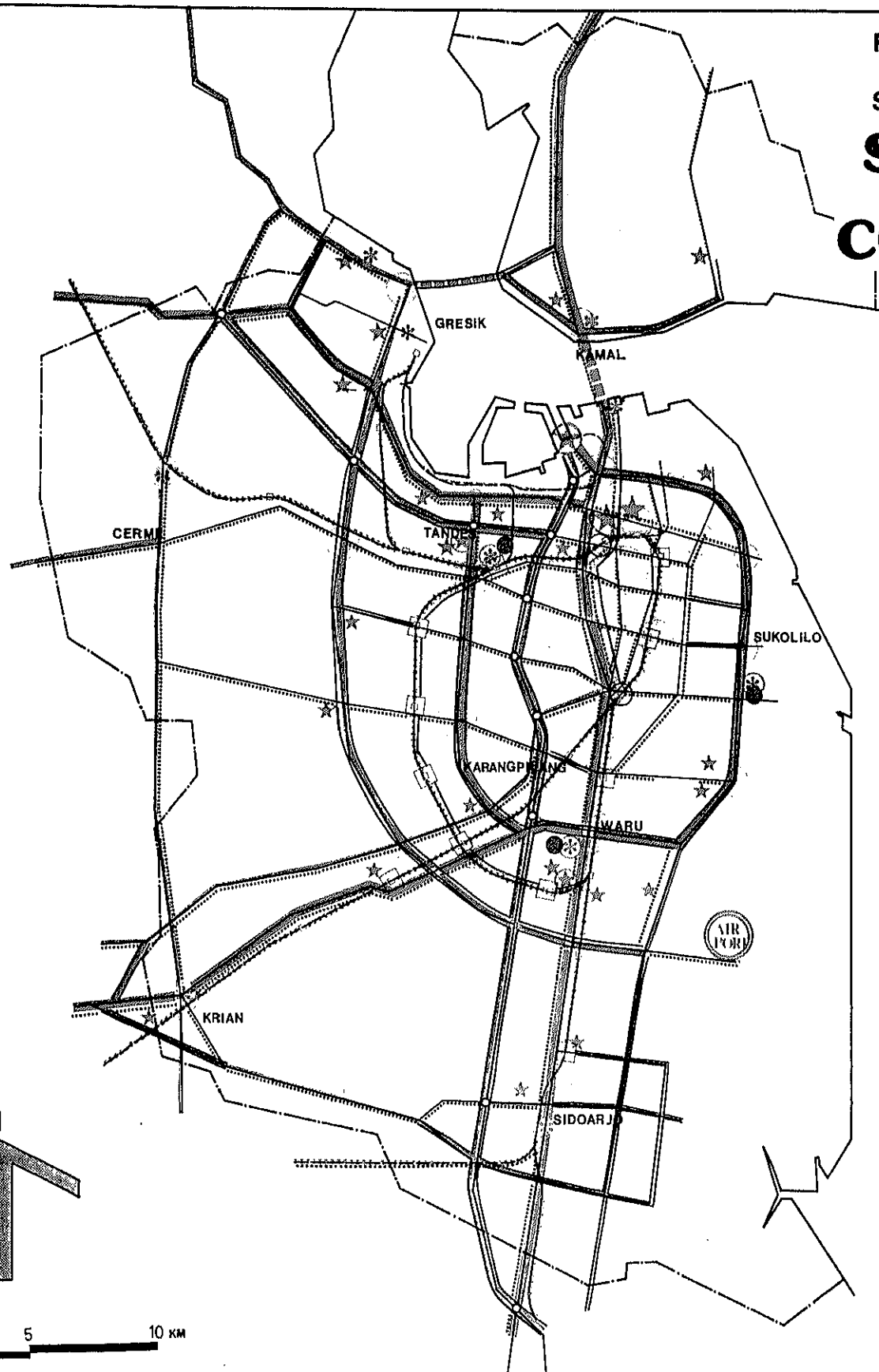
URBAN DEVELOPMENT PLANNING STUDY ON GERBANGKERTOSUSILA  
(SURABAYA METROPOLITAN AREA)



Fig.15.2.5

Surabaya Metropolitan Area

# STRUCTURE PLAN COMMUNICATIONS DIAGRAM



## LEGEND

### ROAD NETWORK SYSTEM

	TOLLWAY (EXISTING PROJECTION)
	PRIMARY ARTERIAL
	PRIM. COLLECTOR
	PRIM. LOCAL
	SECONDARY ARTERIAL STREET
	GRADE - SEPARATION INTER-SECTION

### Policies

	NEW ROUTE
	IMPROVEMENT

### RAILWAY SYSTEM

	PASSENGER/FREIGHT LINE
	FREIGHT LINE
	NEW TRANSIT SYSTEM
	PASSENGER STATION

### Policies

	NEW ROUTE
	TRACK ELEVATION
	REHABILITATION
	NEW LOCATION
	RAILWAY / NEW TRANSIT MODE INTER-CHANGE

### BUS SYSTEM

	INTER-CITY BUS TERMINAL
	MAJOR BUS STATION

### Policies

	NEW LOCATION
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### OTHER INFORMATION

	PRIMARY FUNCTION (MAJOR FREIGHT GENERATER)
	PRIMARY FUNCTION (MAJOR INDUSTRY)

### POPULATION DISTRIBUTION

	400	200	100	thousand prs.
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### EXTENT OF THE PLAN

	BOUNDARY OF URBAN STRUCTURE PLANNING AREA
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URBAN DEVELOPMENT PLANNING STUDY ON GERBANGKERTOSUSILA  
(SURABAYA METROPOLITAN AREA)



Fig. 15.2.6

Surabaya Metropolitan Area

# STRUCTURE PLAN

## URBAN UTILITIES SYSTEM

### LEGEND

WATER SUPPLY SYSTEM

☒ WATER INTAKE

⊠ PURIFICATION PLANT

⊕ DISTRIBUTION POND

— TRANSMISSION PIPE

⋯ DISTRIBUTION PIPE

WASTE TREATMENT SYSTEM

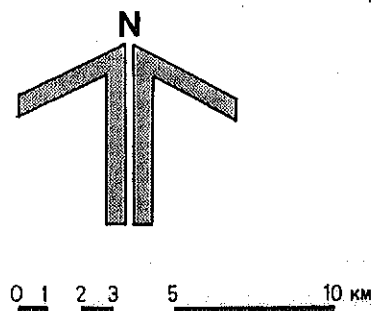
● INCINERATION PLANT

⊙ COMPOST PLANT

▨ LAND FILL SITE

△ WASTE WATER TREATMENT PLANT

▨ URBANIZED AREA



URBAN DEVELOPMENT PLANNING STUDY ON GERBANGKERTOSUSILA  
(SURABAYA METROPOLITAN AREA)





## MAJOR ACTION AREAS

The general conditions for the action areas proposed in the above plan are conceived as follows:

### (1) Action for Industrial Development

#### — Tandes Industrial Complex

As a core of the industrialization policy, a large scale industrial complex is recommended for establishment in the Tandes area, utilizing the existing accumulation.

This complex should include the following facilities:

- Large Scale Industrial Estate (More than 300 ha)
- Cargo Terminal (around 5 ha. – 10 ha.)
- Warehousing (around 50 ha.)
- Container yard
- Commercial facilities
- Park
- Waste Treatment Plant
- Housing
- Passenger Terminal (Bus/Railway)

#### — Waru Industrial Complex

As a centre of an inland type industrial complex, a large-scale industrial complex is desirable in the Waru area so as to make use of the development effect of the Surabaya-Malang Tollway.

The complex is developed centring on the distributional function, and contains the following facilities:

- Cargo Terminal (around 9–15 ha.)
- Middle-Scale Industrial Estate (around 100 ha.)
- Perishable Foods Market/Distribution centre
- Merchandise Market
- Warehouse Estate
- Small-Scale Industrial Estate (For small factories)
- Park
- Housing
- Administrative Facilities
- Commercial Facilities
- Waste Treatment Plant
- Passenger Terminal (Bus/Railway for long distance transportation)

#### — Tg. Perak Industrial Complex

The expansion project of Tg. Perak is already under study financed by the World Bank. At present the feasibility study is nearing completion. Related with this project, the supporting area should be aggressively developed.

In this supporting area, the following facilities are required;

- Container yard
- Cargo Terminal related to the port function.
- Industrial Estate (Export Processing Zone should be considered in this context.)
- Park and Public Social Facilities
- Passengers Terminal (Bus/New Transportation Mode)

#### — Gresik Coastal Industrial Zone Development

In order to make the best use of the existing industrial accumulation and to increase the potential for future development, the coastal area of Gresik should be improved including the port.

#### — Sidoarjo Sub-Regional Centre Development

The impact of the Sidoarjo I.C of Surabaya–Malang Tollway, should be utilized so as to enhance the industrial function of Sidoarjo. The area between the I.C and

the busy district, is recommended to be actively developed as an area to accommodate new factories. The scattered location of factories, which is at present observed, should be controlled.

#### — Rungkut Industrial Development

Centring on the existing industrial estate (SIER), this area is recommended to be further encouraged as an inland type of industrial zone.

In order to bring the capability of the existing accumulation into full, above all the infrastructure for access to the port and the I.C of Surabaya–Malang Tollway should be developed.

### (2) Action for Enhancement of Commercial and Central Function

— Pasar Turi and Kota Area should be improved so as to bring a focus to the central function of the area in the context of the regional area to be administered.

Centring on the railway station, some redevelopment projects are recommended for consideration in the local plan.

— Wonokromo Area is also to be developed as a subheart of the city. The function as a significant transportation mode should be especially taken into account.

### (3) Actions for Housing Development

#### — Park Town Project

The western hill area including Kod. Surabaya and Kab. Gresik is important in meeting the future demand for housing areas. The Study Team proposes that a park town project with around 300–500 thousand population be promoted under Government guidance, utilizing the private sector.

Park Town should be considered as a model of new housing development. Moreover, using this opportunity, some new housing development method or strategy to utilize the private sector should be considered. This would include regulation of land arrangement, rule of urbanization, firm standards of facility development, and so on.

The recommended park town consists of the following major facilities;

- Commercial Centre
- Housing with various type (For Low Income up to High Income; Single Storey Housing Types up to Multi-Storey)
- Recreation Facilities
- Abundant green and open space
- Bus and Railway Terminals
- Social/Educational Facilities
- Service Industry
- Small or Middle Scale Industrial Estate
- Waste Treatment Facilities
- Others

### (4) Actions for Enhancement of Information Function

#### — Sukolilo Research Estate

The relocation for the Institute of Technology, Surabaya (I.T.S.) into this area is highly appreciated from an urban planning point of view.

Centring on this project, educational, institutional and administrative facilities should be collected into this area. Sukolilo Research Estate will support the urban activities on the side of technology and intelligence.

## 10.6 SUMMARY OF RECOMMENDATIONS FOR SECTORAL DEVELOPMENT

### INDUSTRY

- Aggressive promotion of the development of the manufacturing sector.
- Encouragement of production of substitutes for import goods, especially processing and assembling type
- Aggressive inducement of kernel type industries such as "ship building and repairing", "motor vehicles assembling and manufacturing" and "construction materials manufacturing"
- Strategy on encouragement of existing manufacture:
  - Preparation of suitable land for a factory relocation policy
  - Development of infrastructure serving the main industrial locations
- Strategy on encouragement of small-scale factories:
  - Development of a low interest loan system for modernization and rationalization
  - Development of industrial estates for mutual cooperation and consolidation with common facilities
  - Development of a training system for workers
- Development of productive skills so-called intermediate technology, in the traditional industries so as to provide a base for the modern industry
- Development of skilled man power through a vocational system,
- Establishment of a zoning and a guidance system for industrial location
- Aggressive promotion of industrial complex development for differing size and type of manufacture
- Land preparation and land development of about 3,270 ha up to the year 2000:
  - For new factory sites : 2,900 ha
  - For relocated factories : 350 ha
  - For small-scale factories consolidation : 20 ha

### HOUSING

- Further execution programmes for KIP are expected.
- Establish a new improvement system, besides KIP or within KIP, such as a beneficial rates system, land consolidation system, urban redevelopment system, etc.
- Some land use control system by the public sector should be prepared.
- The development programme for betterment, rehabilitation, or renewal should be made clear depending on an evaluation of existing conditions. Evaluation factors are safety, health, convenience and amenity.
- In the mixed areas, creation of open-space for living environment should be undertaken by arrangement of cubic use of land.
- New residential development areas should be undertaken based on a development rule and standard
- A planned way or system to sufficiently develop the necessary infrastructures using the limited government budget should be included in the development regulations and standards, utilizing private activities;
- For housing, the public sector should be the major supplier, especially for low income groups. Existing organizations such as PERUMNUS and Y.K.P. should be more encouraged.
- A recommended model housing development unit area is as follows:
  - Population : 30,000 persons
  - Land area : 150 ha

- Assumed development cost : about 18.5 billion Rp/unit (including roads and public facilities with secondary system but excluding housing cost.)
- Necessary portable water demand : 7.2 t/day/unit

- The development of 9,600 ha for new residential areas is assumed to be needed in SMA up to the year 2000.

### SOCIAL SERVICE FACILITIES

- For commercial facilities development:
  - Comprehensive redevelopment in the area of Pasar Turi, Kembang Jepun and surroundings.
  - Development of business area in Wonokromo
  - Encouragement of the commercial areas of Gresik, Sidoarjo, Kamal and Krian as major activity centres and Waru, Tandes, Karangkilang, Cerme as activity centres
- In SMA, an educational and vocational function should be given high priority. The relevant public facilities to that function should be positively developed.
- The intentional allocation of recreational and leisure facilities should be developed using the existing natural resources and amenities.

### TRANSPORTATION

- Re-organization of Road Network System

The proposal consists of two aspects. One is an appropriate composition for the primary road network to ensure the inter-regional road transportation. The other is that the secondary system in the city should secure effective urban transportation and achieve the development of various urban activities in the area.

- Development of Railway Network System

Railway transportation should be incorporated into a comprehensive urban transportation system.

- Improvement of Public Transportation System

The functions of the existing modes of public transportation should be incorporated into the total public transport system.

- Provision of Terminals

Terminal functions for passenger transport as well as freight should be placed in the transportation network.

The following terminals are recommended to be encouraged or developed:

- Inter-city Bus Terminal (3 places)
- Cargo Terminal (3 places, Tg. Perak, Tandes and Waru, for primary system, 1 place, Sidotopo, for secondary system in the urban area, and 3 places, Sidoarjo, Gresik and Krian, for sub-terminals of regional distribution)
- Ferry Terminal (Surabaya and Kamal for expansion, and Gresik, Kamal for new development)

### RIVER AND DRAINAGE

Concerning river and rainage system improvements, the following are taken into account:

- Waterway planning for protection from salt water intrusion as well as reduction of the peak flood discharge in Surabaya and Sidoarjo
- A new additional waterway and other relevant facilities should be developed in Kedurus River Basin.

- The Lamong river inundates at the lower reaches of Cerme, but this has little influence on the development of SMA.
- Existing secondary/tertiary system in Surabaya, Gresik, Sidoarjo and Kamal should be well maintained, and expanded for the future urbanization.
- Strengthening of canal maintenance work is indispensable.
- A "Coordination Board" for global water flow control should be established.
- Possibility of converting irrigation canals to drainage canals should be investigated.
- Implementation of a feasibility study on the above proposals is strongly recommended.

## UTILITIES

### (1) Water Supply

- New water source developments are indispensable to meet with the water demand up to 2000.

Necessary developments between 1990 and 2000 are:

- Sala river : 10 t/sec
- Surplus irrigation water in Surabaya and Sidoarjo : 6 t/sec
- 4 spring water supplies in Bangkalan : 0.15 t/sec

- The following should be undertaken in order to sufficiently develop water supply system:

- Coordination on water usage between irrigation and urban water
- Examination of the existing water usage
- Examination of the possibility of salt water use for industry

### (2) Waste Water

- A night soil treatment system is to be established with a capacity of 27.4 t/day up to 1990, and with a capacity of 39.8 t/day up to 2000.
- A pilot project of waste water treatment should be executed in a linkage with housing development.
- Industrial waste water should be basically treated within the industrial site.
- Public toilet should be increased and construction of an additional 320 by 1990 and 550 by 2000, is assumed.

### (3) Solid Waste

- An aggressive development programme should be established, based on the forecast of volume generation, 2,835 ton/day in 1990 and 5,067 ton/day in 2000.
- Development of a solid waste management system consisting of four sub-systems, collection, transportation, intermediate treatment and final disposal should be undertaken.
- Execution of master plan and feasibility study based on this Study is recommended.

### (4) Electricity

- The anticipated peak demand in SMA is 1,383 MW in 1990 and 3,549 MW in 2000.
- A wide regional plan is necessary to ensure this supply in SMA by PLN.



PART

IV

IMPLEMENTATION PROGRAMME



## CHAPTER 11 IMPLEMENTATION PROGRAMME

### 11.1 CRITERIA FOR PRIORITY

The structure plan should ensure the various urban activities and should provide for the future needs to encourage the socio-economic development. In this context, planning policy is required to cope with the following two aspects of problems to be solved.

One is how the existing obstructions to development can be eliminated, and the other is how the future structure should be composed in harmony with the actual solution.

The implementation priority of the project is decided taking into account such conditions as follows:

- A project to meet an acknowledge shortage of capacity to cope to the future demand as well as to solve actual problems already happening due to the lack of development.
- A project to prevent a serious problem which is assumed to appear unless the prior investment for development is undertaken.
- A project taken to be an advantage from the national development planning point of view.
- A project from which a large socio-economic return and benefit can be expected.

As the results of assessment of the problems to decide the higher priority projects in GKS Region and SMA, the following are listed:

- Water problem; a critical factor for the urban development of SMA including the proper and appropriate allocation of water demands from irrigation and from urban use.
- Distribution facilities development; to realize an integrated and consistent system both in the urban area and in the rural hinterland area.
- Social change in the rural area; to settle the population in the rural area, developing the industries in the rural area and to supply the labour force in adequate size for the integrated urban industrial area.
- Quality of resident's life; to promote and maintain the quality of a resident's life through aggressive industrialization, development of infrastructure, improvement of living environment, and efficient socio-economic system development, etc.

### 11.2 STAGING PROGRAMME

#### STRATEGIC DEVELOPMENT STAGES

The Team intends to divide the time span toward the year 2000 into three stages as follows:

- 1st stage : period for economic base formation
- 2nd stage : period for adjustment
- 3rd stage : period for socio-economic self-support

The first stage is assumed to be a period of development of infrastructure as a basis for industrialization.

The second stage is a period to adjust the executed projects and their aimed effect, by carrying out smaller projects to raise the effect of the plan.

The third stage is a period to distribute development benefits to the hinterland through the inter-relationship system developed during the first and the second stages.

The above concept is shown in Fig. 16.2.1.

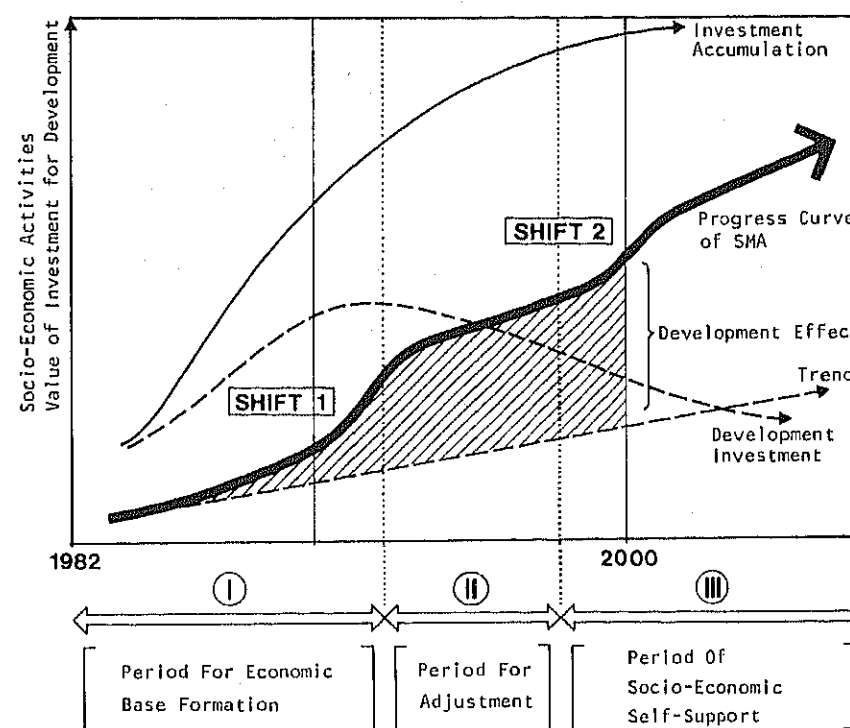


Fig. 16.2.1 CONCEPT OF DEVELOPMENT STAGE

#### STAGING OF PHYSICAL STRUCTURE DEVELOPMENT

##### First Development Stage

- Development of major structures in the peripheral area of the busy central area in order to increase development capacity.
- Development and encouragement of the distributional functions e.g. cargo terminals and port improvements for the planned industrialization.

##### Second Development Stage

- Formation of the entire structure; especially the infrastructure development in the outer area of SMA which is best executed at this stage in order to ensure the capacity to accommodate housing and industrial developments in the planned and orderly system.
- The outer ring roads and the extension of the east-west trunk routes are in the second stage.

##### Third Development Stage

- Redevelopment and improvement of the busy built-up area to emphasize the commercial and business function.
- Measures to cope with the mass-transportation systems.

Through these stages, the following developments should be continuously executed:

- Improvement of housing areas
- Development of social facilities in accordance with increase of population, especially educational and medical facilities.
- Development of urban utilities related with up-grading the residential environment.

Development stages are categorized into three stages as described in Fig. 16.2.3.



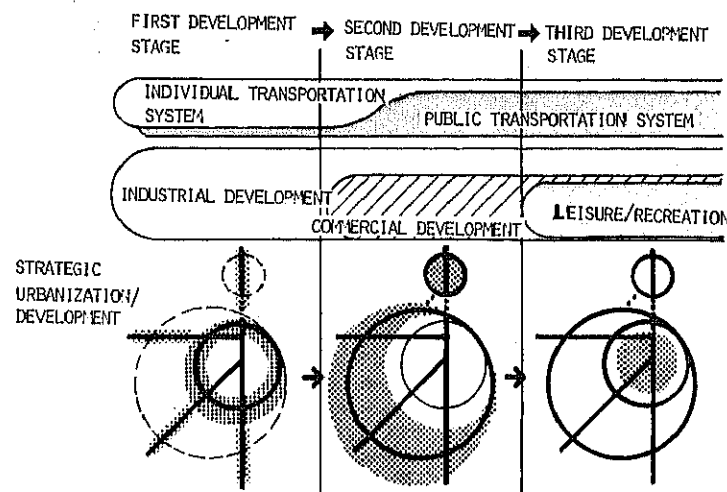


Fig. 16.2.3 DEVELOPMENT STAGE FOR SPATIAL STRUCTURE

### 11.3 PROGRAMME/PROJECTS AND PROJECT COST

The proposed programme and projects are listed as Table 17.1.1.

The priority is evaluated in the following ranking.

Priority "A" : The highest priority to be completed in the short term (Pelita IV) up to 1989.

Priority "B" : High priority to be completed in the long term up to 2000.

Priority "C" : The project to be prepared with a prospect beyond 2000 or to be executed after 2000.

The cost of each project is estimated by applying a unit cost based on past data from Indonesia and Japan. The total project cost is estimated by programme as follows;

I. Urban development programme	: 3,875,900 Million Rp.
II. Transportation development programme	: 4,486,600
III. Urban utility development programme	: 5,114,000
Total	: 13,476,500 (at 1982 price)

### 11.4 PROSPECT OF DEVELOPMENT BUDGET

According to the argument in Sections 1 through 4 the SMA Development Programme is feasible through the following conditions and assumptions:

(1) Term of investment; 25 years (from 1985 up to 2010)

(2) Allocation of finance;

– The national government	: Rp. 10,712.4* billion (79%)
– The local governments	: Rp. 2,804.7 billion (21%)
– The total	: Rp. 13,517.0 billion (100%)

\*This amount is identical to the share of 10% of the total national development budget in Indonesia. Whilst, the share of GRDP of SMA as at present about 3.3%.

(3) The central government should finance a long-term loan almost equal to the investment cost of local government with 5–6% interest. In case of 6% interest, the payment will finish after 2040 and in case of 5% interest it will finish after 2030.

(4) The central government loans funds to the local governments identical to the investment cost of the local governments. (at most 6.3% of the total loans)

## 11.5 ADMINISTRATIVE POLICY AND STRATEGY

### POPULATION CONTROL

The population should be controlled under consideration of the following policies:

- Basically, to eliminate any possible social upheavals, the rate of increase of population in SMA should be controlled so as to equal the capacity to absorb arising from the increase in development.
- An administrative guidance for job introduction and employment security should be firmly performed to control the illegal inflow of labourers.
- A mandatory directive by the relevant authorities is necessary to clear illegal occupants.

### LAND PREPARATION

To enforce the action plans drawn from the structure plan, a large amount of land should be prepared. For this purpose, the following measures will be required to reduce the budget constraints for the public agencies.

- i) Regulating Criteria for Housing Development;
- ii) System of Intentional Prior Land Acquisition;
- iii) Land Consolidation System;
- iv) Tax Incentives for Owners Submitting Land for Public Purpose; and
- v) Supervision of Appropriate Land Price and Compensation Costs.

### ENCOURAGEMENT OF PRIVATE INVESTMENT

In order to invite the private sector investment to the area, incentives such as the following will be required;

- To strengthen a relationship with markets and major freight generators by the development of a road network, and
- To prepare industrial estates with well-developed infrastructure

From the administration process, also the following two policies will induce private investors, foreign and domestic.

- Simplification of procedures and partial localization of administrative decisions, and
- Active inducement middle and small scale foreign investors so as to encourage the transfer of production technology.

The Government has aggressively promoted small scale industry, by the so-called "BIPIK" programme. (Bimbingan dan Penyuluhan Industri Kecil = Guidance and Counciling of Small Industry). It is expected that this programme will be promoted more effectively. It is also recommended to develop a low interest loan system to small business owners for participation in consolidation projects or modernization of management and production systems.

### ESTABLISHMENT OF URBANIZATION RULE

A local plan based on the structure plan, should be established in each local autonomy, and it is recommended that this should be studied in detail and authorized as soon as possible.

The considered factors for the urban rules are as follows:

- i) Definition of Parking Area in the CBD;
- ii) Establishment Criteria for Housing Development;
- iii) Definition of the Area for Development;
- iv) Establishment of Regulations for Preservation of Nature, and
- v) Adjustment Rule for Conversion of Cultivated Land to Urban Use

Table 17.1.1 PROJECT LISTS FOR SMA DEVELOPMENT

Development Programme/Project	Priority (A/B/C)	Project Cost (1982 Price) Mill. Rp.			
I. URBAN DEVELOPMENT PROGRAMME		<u>3,875,900</u>		4-5 Other Environmental Development Projects	A/B/C 306,000
1. Industrial Development Programme		<u>714,500</u>		4-6 Relevant Developments	259,600
1-1 Industrial Estate Development Project (Middle and Large Scale)	A/B	450,000		5. Major Public Facilities with high level Function Development programme	<u>98,800</u>
1-2 Industrial Estate Development Project (Small Scale)	A/B	60,000		5-1 Medical Facilities Development Project	B 18,000
1-3 Tg. Perak Port Supporting Area Development Project	B	137,500		5-2 Educational and Vocational Facilities Development Project	A/B 23,000
1-4 Renewal, Redevelopment and Improvement of the Built-up Industrial Area	B/C	56,000		5-3 Social-Cultural Facilities Development Project	B/C 6,800
1-5 Relevant Facilities		65,000		5-4 Park and Recreation Facilities Development Project	B/C 42,000
2. Distribution Facility and System Development Programme		<u>68,500</u>		5-5 Relevant Developments	9,000
2-1 Truck Terminal Development Project	A/B	27,300		II. TRANSPORTATION DEVELOPMENT PROGRAMME	4,486,600
2-2 Distributional Market Development Project	B	4,800		1. Road Development Projects	1,761,100
2-3 Warehouse Estate Development Project	B/C	27,200		1-1 Surabaya-Malang Tollroad	A 27,600
2-4 Distributional Relevant Facilities Development Project in the Built-up Area	B/C	3,000		1-2 Surabaya-Gresik Tollroad	A 70,600 B 9,300
2-5 Relevant Facilities		6,200		1-3 Middle Ring Road	A 545,600 B 23,400
3. Central Commercial Function Encouragement Programme		<u>138,600</u>		1-4 Outer Ring Road (1)	A 52,600 B 371,400
3-1 Redevelopment of Central Business District	B/C	48,200		1-5 Outer ring Road (2)	A 145,500 B 115,500
3-2 Central Commercial District Improvement Project	B/C	700		1-6 Jl. Gresik	A 36,100
3-3 Parking Lot Development Project	A/B/C	77,400		1-7 Gresik-Lamongan	B 8,900
3-4 Relevant Facilities		12,600		1-8 Wonokromo-Karangbilang-Krian	A 32,100 B 64,300
4. Housing Development Programme		<u>2,855,500</u>		1-9 Waru-Krian	A 6,500 B 57,600
4-1 New Housing Development Project by Public Body	A/B/C	643,900		1-10 Krian By-pass	B 15,000
( Among these projects, Driorejo Housing Complex Development	A	185,760		1-11 Wonokromo-Sidoarjo	B 94,700
4-2 Public Service Facilities Development Project for Population Increase	A/B/C	850,000		1-12 Airport-Sidoarjo	A 49,200
4-3 Improvement Project for the Built-up Residential Area	A/B/C	168,500		1-13 Gresik By-pass	A 20,300 B 14,900
4-4 Redevelopment Project for the Mixed Area with Commercial and Residential Function	B/C	627,000		2. Street Development Project	<u>735,400</u>
				2-1 Jl. Kenjerang	A 5,100 B 16,800
				2-2 Jl. Dupak Rukun-Kapass-Krampung-Kenjeran	A 43,400
				2-3 Tandes-Cerme	A 57,500 B 17,900
				2-4 Tandes-Jl. Darmah Husada	A 18,300 B 34,000
				2-5 Tandes-Manyar Kertoarjo	A 63,400 B 1,400
				2-6 Jl. Darmo Permai-Middle Ring Road	A 54,300 B 20,300
				2-7 Jl. Jagir Wonokromo	B 7,600

(Continue)

(Continue)

Table 17.1.1 (Continued)

2-8	Menganti-Rungkut	A	73,200				
		B	40,500				
2-9	Port-II, Gunung Sari	A	12,900				
		B	32,800				
2-10	Jl. Semarang-Tg. Perak	B	33,600				
2-11	Jl. Diponegoro-Kedungdoro-Mas mansyur	A	14,000				
		B	32,600				
2-12	Jl. Raya Darmo-Tunjungan- Parawan	A	24,900				
2-13	Jl. Ngagel-Ambakrejo-Tenggumun Wetan	A	6,300				
		B	22,700				
2-14	Jl. Raya Rungkut-Manyar-Kedung Covek	B	35,400				
2-15	New Harbour Access Road	A	17,300				
2-16	Sidoarjo Major Streets	B	43,600				
2-17	Kamal-P.T Cemen	A	5,600				
3.	Grade Separation Intersection		127,500				
3-1	Jl. Pasartuti-Dupak	A	3,300				
3-2	Jl. Tembakan-Parawan	A	4,000				
3-3	Jl. Embomalang-Kedungdoro	A	3,300				
3-4	Jl. Embomalang-Basuki Rakhmad	A	3,300				
3-5	Jl. Raya Diponegoro-Banyuurip	A	3,300				
3-6	Jl. Pandegiling-Sulawesi	A	10,000				
3-7	Jl. Kertaja-Dharmawangsa	A	3,300				
3-8	Wonokromo Interchange	A	27,700				
3-9	Jl. Gresik-Tg. Perak	B	3,300				
3-10	Jl. Kenjerang-K.Masmansur	B	3,300				
3-11	Jl. Kenjerang-Kedungcovek	B	3,300				
3-12	Jl. Demak-Dupak Rukun	B	3,300				
3-13	Jl. Dupak-New Street	B	3,300				
3-14	Jl. Kusuma-Ngaglik	B	3,300				
3-15	Jl. Kapas Krampung-Karangasam	B	3,300				
3-16	Jl. Kali butuh-Demak	B	3,300				
3-17	Jl. Semarang-Kranggan	B	3,300				
3-18	Jl. Gebeng-Pemuda	B	3,300				
3-19	New Street (To Tg.Perak)- Banyuurip	B	3,300				
3-20	Jl. Raya Diponegoro-Dr. Sutomo	B	3,300				
3-21	Jl. Kali bokor-Ngagel Jaya	B	3,300				
3-22	Jl. Kali bokor-Manyar	B	3,300				
3-23	Jl. Jend Sungkono-New Street (Tg.Perak)	B	3,300				
3-24	Jl. Raya J.Akhmad Yani- Jamursari	B	3,300				
3-25	Waru Intersection	B	3,300				
				3-26	Aroha Intersection	B	3,300
				3-27	Krian Intersection	B	3,300
				3-28	Jl. Gresik-Margomulyo	B	3,300
				3-29	Kali Lamong Intersection (Jl. Gresik)	B	3,300
				4.	Terminal		81,800
				4-1	Bus Terminal	A	46,000
				4-2	Ferry Terminal	A	20,200
						B	10,000
				4-3	Railway Station Plaza	A	4,400
						B	1,200
				5.	Railway Development Programme		1,143,600
				5-1	Rehabilitation of Tg. Perak Freight Line	A	4,600
				5-2	Rehabilitation of Sidoarjo- Tarik Line	A	1,700
				5-3	Coach Yard Rehabilitation	A	400
				5-4	Construction of New Ring Line, Western Section, Phase-I	A	101,000
					Phase-II	B	3,500
				5-5	Track Elevation, Eastern Ring Section, Phase-I	A	231,300
					Additional Section, Phase-II	B	131,000
				5-6	Electrification	A	120,000
				5-7	Development and Improvement of Stations, Phase-I	A	49,000
					Phase-II	B	32,500
				5-8	Land Aquisition for Yard, Depot and Workshop, Phase-I	A	12,900
					Construction for Phase-II	B	40,000
				5-9	Purchase of Coaches and Diesel Cars, Phase-I	A	89,000
					Phase-II	B	93,000
				5-10	Development of New Trans- Portation	A	233,700
				6.	Airport Improvement Programme		75,100
					Extention of Facilities (Phase-I)	A	40,400
					(Phase-II)	B	34,700
				7.	Tg. Perak Port Development		562,100
					Construction of 21 Berth	A	173,900
					Construction of 71 Berth	B	386,700
					Reclamation	B	1,500

(Continue)

(Continue)

Table 17.1.1 (Continued)

III. URBAN UTILITY DEVELOPMENT PROGRAMME		5,114,020
1. Water Supply Development		1,412,220
1-1	Umbulan Supply System A	250,000
1-2	Water Transmission to Gresik A	4,800
1-3	Mini Plant Development A	900
1-4	Resources Development A	120
1-5	Waru Supply System (Phase-I) A	130,000
	(Phase-II) B	213,000
1-6	4 Spring Water Development A	56,400
1-7	Sala River Supply System B	571,000
1-8	Replacement of Old Distribution Pipe A	186,000
2. Waste Water Treatment System		1,757,200
2-1	Expansion of Public Toilet A	400
	B	1400
2-2	Introduction of Night Soil Treatment Plant A	11,300
	B	17,000
2-3	Pilot Project of Waste Water Treatment System B	275,100
2-4	Full Scale Waste Water Treatment Plant C	1,452,000
3. Solid Waste Treatment System		198,100
3-1	Provision of Container Depot A	8,400
	B	12,300
3-2	Purchase of Equipment/Tool A	8,000
	B	19,000
3-3	Incineration Plant A	13,300
	B	79,700
3-4	Land Fill Site Development A	26,500
	B	30,900
4. River/Canal Improvement Programme		251,400
4-1	Cleaning of Existing Canal A	1,200
4-2	Construction of Sea Dike A	4,100
	B	1,900
4-3	Up-Grading of Sea Dike A	400
4-4	Improvement of Canals A	183,300
	B	26,100
4-5	Construction of New Canal B	9,400
4-6	Renewal of Dams A	5,000
4-7	River Tributaries Improvement B	20,000
5. Electricity Expansion A/B		1,495,100
5-1	Generators, Substation, Transmission (Phase-I) A	800,800
5-2	Generators, Substation, Transmission (Phase-II) B	691,500
5-3	150 Substation (Phase-III) C	2,800

## 11.6 GOVERNMENT ORGANIZATION

As a recommendation, the Team proposes the modification of the administrative organization for development execution. Main points of the modification are the following:

- i) Introduction of a wide range administrative body, and
- ii) Introduction of a monitoring system

The new body of the development administration should have the following functions:

- i) Planning and investigation of the plan: -- to study each project which covers a wide area of the foreign
- ii) Implementation of the plan
- iii) Adjustment of interests between the related administrative bodies
- iv) Adjustment between various kinds of projects

A monitoring system should be proposed as a part of the organization promoting the development programme.

The monitoring would be for such activities as industry, society, civil life and administration and with the following criteria:

- i) Whether each project has a negative effect upon any kind of activity in the region, and
- ii) Whether the plan has the scheduled effect on the region.

## 11.7 SHORT-TERM DEVELOPMENT PROJECTS

Table 19.1.1 LIST OF SHORT TERM PROJECTS

### I. URBAN DEVELOPMENT PROGRAMME

- (1) Industrial Estate Development Project (Large and Middle Scale)
- (2) Industrial Estate Development Project (Small Scale)
- (3) Truck Terminal Development Project
- (4) Parking Lot Development Project
- (5) New Housing Development Project (by Public Body)
- (6) Public Service Facilities Development Project for Population Increase
- (7) Improvement Project for the Built-up Residential Area
- (8) Other Environmental Development Projects
- (9) Educational and Vocational Facilities Development Project

### II. TRANSPORTATION DEVELOPMENT PROGRAMME

- (1) Road Development Projects
  - Surabaya-Malang Tollroad
  - Surabaya-Gresik Tollroad
  - Middle Ring Road
  - Outer Ring Road (1)
  - JL. Gresik
  - Wonokromo-Karangpilang-Krian Road
  - Gresik By-pass
  - JL. Dupak Rukun-Kapass Krampung-Kenjeran Street
  - Tandes-Manyar Kertoarjo Street
  - JL. Darmo Permai-Middle Ring Road
  - JL. Jagir Wonokromo
  - Menganti-Rungkut Street
  - JL. Margomulyo-Sepanjang Street
  - Port-JL. Gunungsari Street

- Port-JL. Gunungsari Street
- Kanal-P.T Cemen Street
- Intersection Grade Separation
- JL. Tg. Perak-Gresik
- JL. Raya Diponegoro-Banyurip
- JL. Tidar-Semarang
- JL. Pandegiling-Sulawesi
- Wonokromo Interchange
- JL. Kaya Jend. Akhamed Yani-Rungkut

- (2) Bus Terminal Development Project
- (3) Ferry Terminal Development Project
- (4) Railway Development Projects
  - Rehabilitation of Tg. Perak Freight line and Sidoarjo-Tarik Line
  - Coach Yard Rehabilitation in Sidotopo
  - Construction of New Ring Line (Western Section, Phase-I)
  - Truck Elevation, Eastern Ring Section, Phase-I
  - Electrification
  - Development and Improvement of Stations, Phase-I
  - Development of Station Plaza
  - Land Acquisition for Yard, Depot and Workshop
  - Purchase of Coaches and Diesel Cars
  - Development of New Transportation System
- (5) Airport Improvement Project
- (6) Tg. Perak Port Development Project

### III. URBAN UTILITY DEVELOPMENT PROGRAMME

- (1) Water Supply Development Projects
  - Umblan Supply System
  - Water Transmission to Gresik
  - Mini Plant Development
  - Resources Development
  - Waru Supply System (Phase-I)
  - 4 Spring Water Development in Bangkalan
  - Replacement of Old Distribution Pipe
- (2) Waste Water Treatment System Development Projects
  - Expansion of Public Toilets
  - Introduction of Night Soil Treatment Plant
- (3) Solid Waste Treatment System Projects
  - Provision of Container Depot
  - Purchase of Equipment/Tool
  - Incineration Plant
  - Land Fill Site Development
- (4) River/Canal Improvement Projects
  - Cleaning of Existing Canals
  - Construction of Sea Dike
  - Up-Grading of Sea Dike
  - Improvement of Canals
  - Renewal of Dams
- (5) Electricity Expansion Project

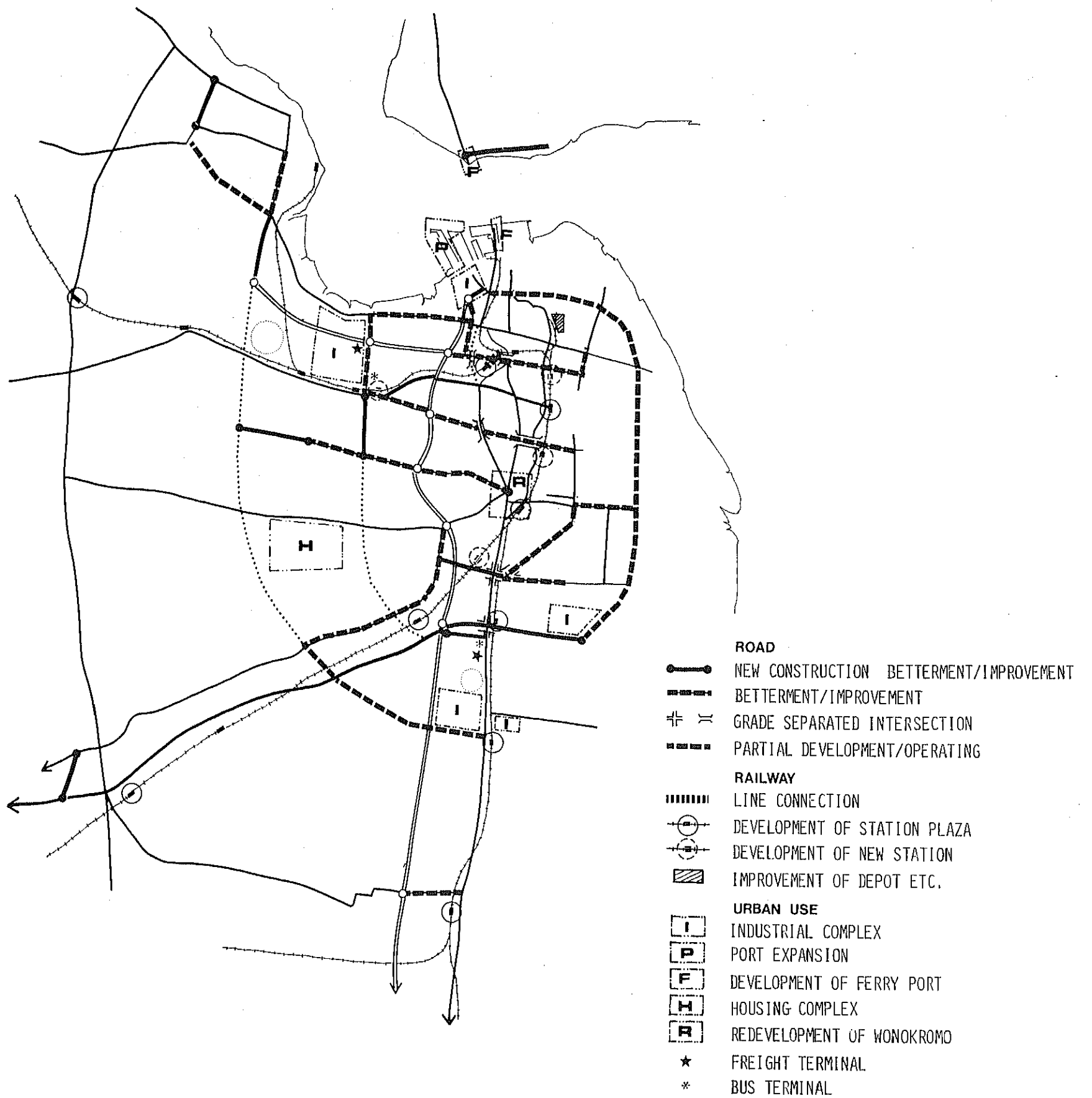


Fig. 19.1.1 SHORT TERM DEVELOPMENT PROJECT

## 11.8 PRELIMINARY STUDIES FOR SELECTED TRANSPORT PROJECTS

In this section, the viability of the following two projects will be assessed. First is the Middle Ring Road Project, which is planned to be incorporated into the tollway network system in SMA together with Surabaya-Malang and Surabaya-Gresik Tollways.

The other is the New Transit System Project, which is expected to secure the traffic demand in the north-south direction passing through the busy central urban area of Surabaya and to relieve the shortage of road density in that area. The corridor locations of these projects are presented in Fig. 20.1.1.

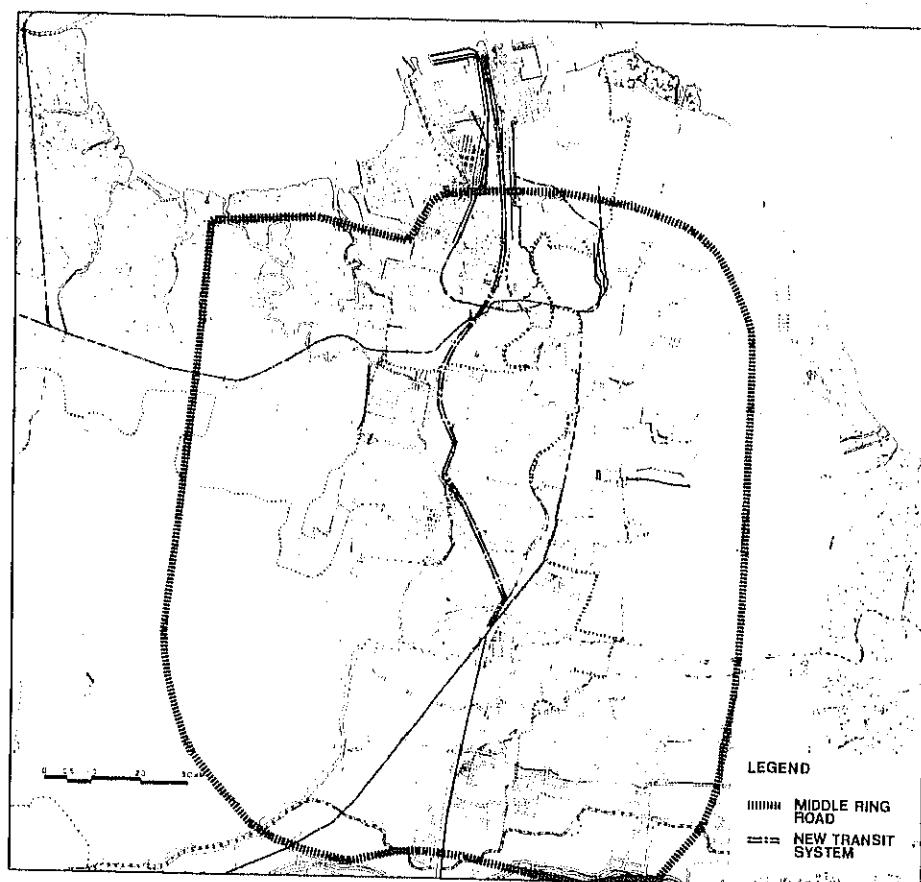


Fig. 20.1.1 LOCATIONS OF PROJECT CORRIDORS

### (1) MIDDLE RING ROAD PROJECT

In order to carry out the prefeasibility study for the Middle Ring Road, the following premises are assumed:

- Middle Ring Road is proposed to operate as a tollway with a tariff system of toll charge proportional to distance.
- Toll rate is determined within a limit of user's financial benefit directly received from use of the tollway. That is, savings in time costs and vehicle operating costs. Referring to the relevant tollway study reports, a toll rate was assumed to be Rp.30/km as a consequence.
- When a road is operating as a tollway, there must exist a parallel non-toll road in order to assure the equal opportunities to all the potential road users.

## CONSTRUCTION COST ESTIMATES

### (1) Total Length of the Project Road

The total length of the project road was assumed to be 41.5 km and it consists of the East-Ring (Waru-Sukolilo-Tg. Perak) of 22.5 km and the West-Ring (Waru-Karangpilang-Tandes) of 16.0 km.

### (2) Cost Estimates

Referring to the experience in tollway construction in Indonesia and relevant study reports and data, costs for the road construction, land acquisition and operation/maintenance were estimated as shown in Table 20.1.1.

The economic costs of the project were assumed to be 88% of the estimated financial costs, but excluding land acquisition costs, based on the recent study on tollway project of "Jakarta Harbour Road, November, 1981".

Table 20.1.1 CONSTRUCTION COST ESTIMATES

	(at 1982 Prices)		
	Construction Costs (x 10 <sup>6</sup> Rp.)	Land Acquisition Costs (x 10 <sup>6</sup> Rp.)	Operation/Maintenance Costs (x 10 <sup>6</sup> Rp./year)
<u>Before the year 1990</u>			
Tollway (East-Ring, 4-lane: 22.5 km)	148,670	89,580	765 + 637
Tollway (West-Ring, 2-lane: 8 km and 4-lane: 8 km)	96,910	35,910	720 + 600
Parallel Road (41.5 km)	136,950	37,560	249
<u>Before the year 2000 (Additional Costs)</u>			
(Additional Costs)			
Tollway (East-Ring, 2-lane: 19.0 km and 4-lane: 6.5 km)	8,580	-	195 + 165
Tollway (West-Ring, 4-lane: 12.8 km and 6-lane: 3.2 km)	14,790	-	279 + 232

## FINANCIAL IRR

Based on the estimated streams of project costs and revenue, financial internal rates of return were calculated as shown in Table 20.1.2. In order to assess the financial viability of the project, several case studies were conducted varying some factors of cost and revenue components. The conditions applied in these cases are as follows:

- Base Case: All of the project costs are owed by a tollway operating body and the toll rate rises at 3% p.a. with revisions every 5 years after 1982.
- Case A: The project costs excluding the land acquisition costs and owed by the operation body and the toll rate rises as same as in the Base Case.
- Case B: The project costs excluding the land acquisition costs are owed by the operation body and the toll rate rises at 5% p.a. with revisions every 5 years after 1982.
- Case C: All of the project costs are owed by the operating body and the toll rate rises at 5% p.a. with revisions every 5 years after 1982.

**Table 20.1.2 COMPARISON OF FINANCIAL IRR FOR DIFFERENT CASES**

Case No.	Financial IRR (%)
Base Case	4.6
Case A	7.7
Case B	11.1
Case C	7.8

### ECONOMIC IRR

Comparison of pcu-km and pcu-hour on the road network was made between "With" and "Without" Middle Ring Road, which is composed of both tollway and parallel road. Based on the comparative results, economic benefits were derived from the savings in vehicle operating costs and time costs in money terms.

Economic internal rates of return on the project were calculated for the respective cases based on the cost and benefit flows. The results are summarized in Table 20.1.3.

**Table 20.1.3 ECONOMIC IRR FOR DIFFERENT CASES**

Case No.	Economic IRR (%)
Base Case	38.3
Case A	23.1
Case B	18.2

**Note:**

- Case A: 50% of the original estimation is adopted.
- Case B: Only the saving in vehicle operating costs is adopted.
- Case C: All of the project costs are owed by the operating body and the toll rate rises at 5% p.a. with revisions every 5 years after 1982.

### CONCLUSION AND RECOMMENDATION

The tollway project for Middle Ring Road is financially feasible. In order to reduce a burden of liability on tollway operation it is desirable for the operating body that the Government provides the land at the Government's cost. The Government expenses for the project will be justified by the economic feasibility of the project.

Fund raising and repayment conditions for the project implementation are also factors which affect the feasibility of the project. During a detailed study phase, the following conditions and factors should be considered in order to prepare a real implementation programme:

- Price escalation of the construction costs for both foreign and local currency portions,
- Financing plan for the capital requirements for both foreign and local currency portions,
- Loan conditions and repayment schedule,
- Clarification of responsible organizations to be liable for loans and bonds; and also their extent of liability,
- Proportions of equity/owned capital,
- Taxation on the revenue.

The Middle Ring Road Project, consisting of the tollway and its parallel general road, is economically feasible. As seen in Table 20.1.3, the negative factors to reduce the benefits of the project were overwhelmed by the significance of the project road.

Therefore, it is recommended to prepare for the following detailed study phase as soon as possible.

### (2) NEW TRANSIT SYSTEM PROJECT

#### COST ESTIMATES

The proposed New Transit System is planned to utilize as much as possible the existing right-of-way of the unused steam tram tracks between Wonokromo and Tg. Perak. It is also intended to operate the system on an elevated structure and to provide the effective land space for roads, urban facilities and so forth. Therefore, the land which is produced by the track elevation and used for urban activities is assumed to be compensated for as a form of subsidy to the construction of the New Transit System.

As a result, construction and operation costs of the New Transit System project were estimated as shown in Table 20.1.4.

**Table 20.1.4 ESTIMATED CONSTRUCTION AND OPERATION COSTS OF NEW TRANSIT SYSTEM**

Construction Costs:	17,875x10 <sup>6</sup> Rp./kmx80%x12 km =	171,600 mill. Rupiah
Rolling Stocks:	330x10 <sup>6</sup> Rp./unitx188 units =	62,040 mill. Rupiah
Operating Costs:	250x10 <sup>6</sup> Rp./kmx12 km =	3,000 mill. Rupiah

### FINANCIAL IRR

Based on the implementation schedule and the traffic demand forecast of the New Transit System, financial rates of return were calculated for the alternative fare rates of Rp.10/km and Rp.15/km as presented in Table 20.1.5.

**Table 20.1.5 FINANCIAL IRR OF THE PROJECT**

Alternative Fare Rate	Financial IRR (%)
Rp.15/km	13.9
Rp.10/km	8.7

**Notes:**

The project life span was assumed to be 25 years from the commencement of operation. The fare rates were assumed to rise 3% p.a. with revisions every 5 years after 1982.

### CONCLUSION AND RECOMMENDATION

The New Transit System project is financially feasible. Therefore, it is recommended to start the preparation of master plan study for an urban mass transit system in SMA and a subsequent feasibility study on Wonokromo-Tg. Perak line should be carried out as soon as possible towards the realization of a total commuter train network in SMA.