

THE REPUBLIC OF INDONESIA
REPORT
OF
THE FEASIBILITY STUDY
ON
THE RAILWAY IMPROVEMENT
IN
KAMPUNG BANDAN STATION AREA

January 1986

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

THE REPUBLIC OF INDONESIA

REPORT

OF

THE FEASIBILITY STUDY

ON

THE RAILWAY IMPROVEMENT

IN

KAMPUNG BANDAN STATION AREA

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JAPAN INTERNATIONAL COOPERATION AGENCY
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PREFACE

In response to the request of the Government of the Republic of Indonesia, the Japanese Government decided to conduct a feasibility study on the Project for Railway Improvement in the Kampung Bandan Station Area and entrusted the study to the Japan International Cooperation Agency (JICA).

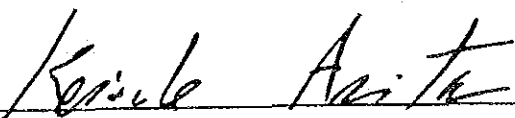
JICA sent to Indonesia a study team headed by Mr. Hotsumi HARADA of the Japan Railway Technical Service, in November 1984.

The team had discussions on the Project with the officials concerned of the Government of the Republic of Indonesia including officials from the Indonesian State Railways and conducted a field survey. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Indonesia for the close cooperation they extended to the team.

January, 1986



Keisuke ARITA
President
Japan International Cooperation Agency

JAPAN RAILWAY TECHNICAL SERVICE

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RAILWAYTECHS TOKYO

January, 1986

Mr. Keisuke ARITA
President
Japan International Cooperation Agency
Tokyo, Japan

Dear Sir,

LETTER OF TRANSMITTAL

We have the pleasure of submitting herewith the final report for the Feasibility Study on the Railway Improvement in Kampung Bandan Station Area in the Republic of Indonesia.

The Study was conducted from November 1984 to January 1986. During this period, two field surveys were carried out, from November to December 1984 and again from January to February 1985.

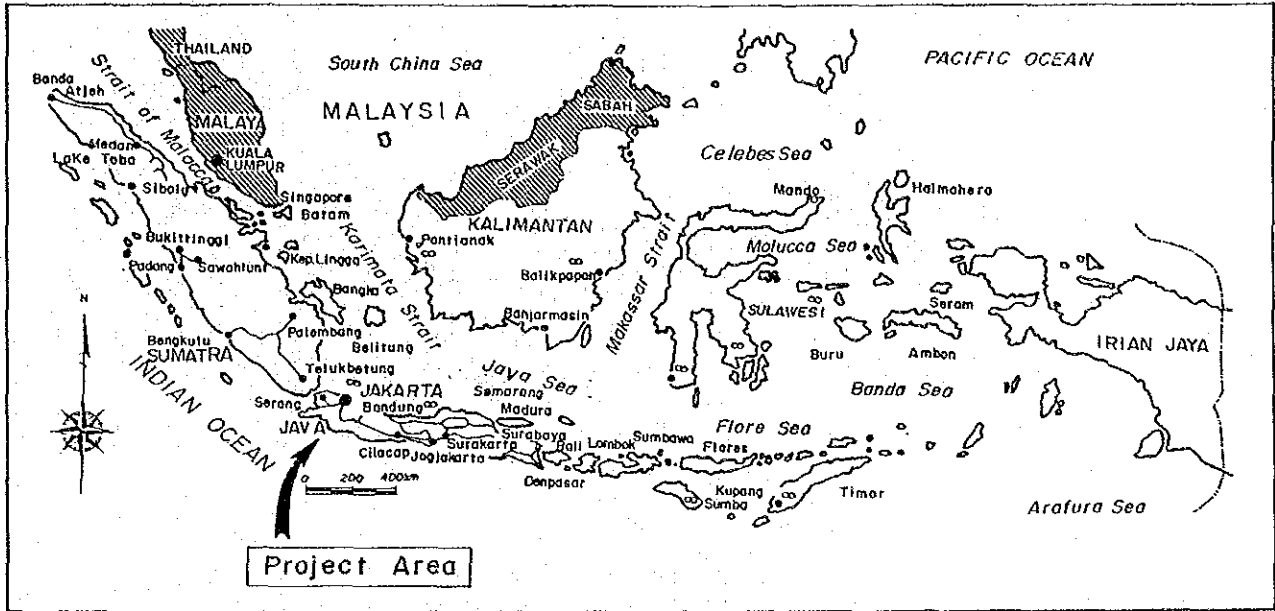
The Study proposed the railway improvements in Kampung Bandan Station Area, including a plan for the loop train operation to be achieved by connecting Western and Eastern lines, and a plan for construction of the New Kampung Bandan Station. We hope that the Study will serve for the implementation of this project and will contribute to promote the JABOTABEK railway network development.

We wish to express our sincere gratitude to the officials of your Agency, the Advisory Committee, the Embassy of Japan in Indonesia, as well as to those concerned of the Government of the Republic of Indonesia, for the kind assistance and cooperation they extended to the Study Team.

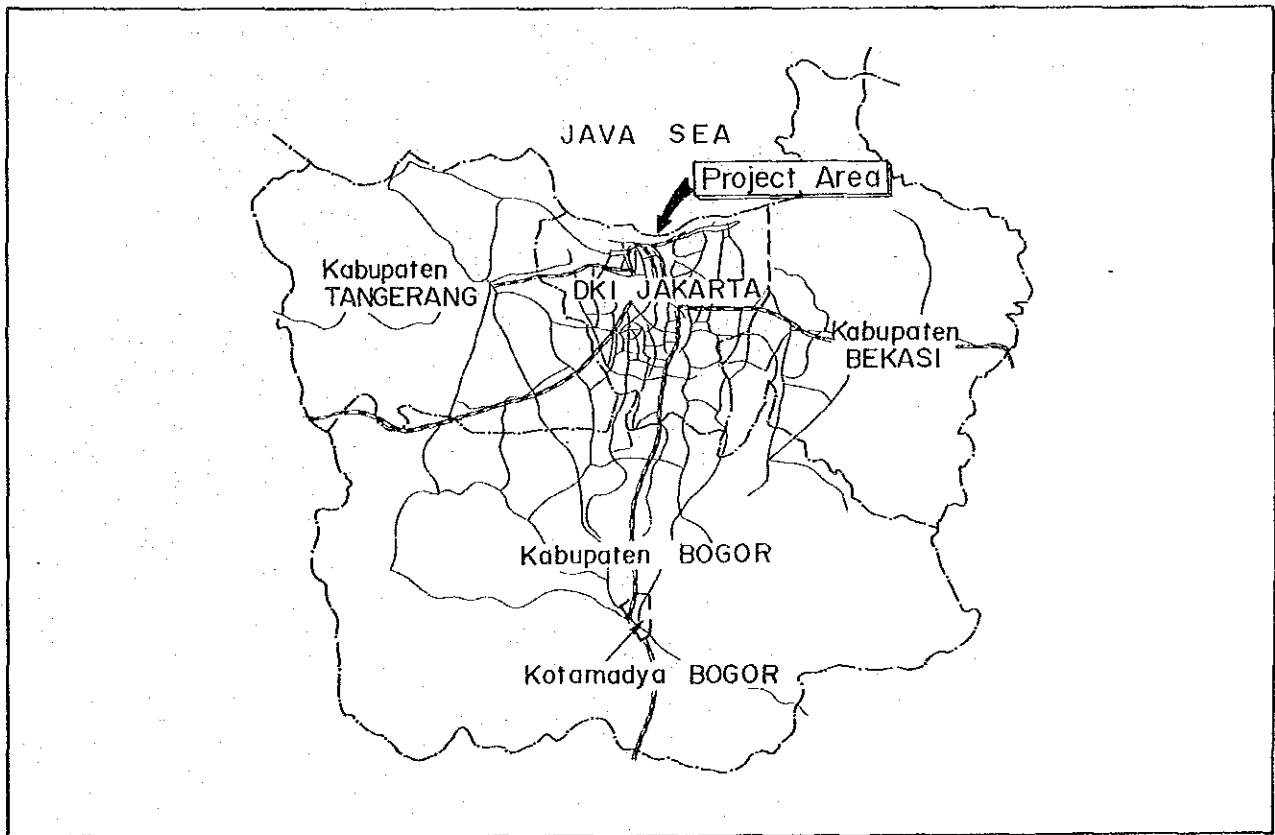
Very truly yours,



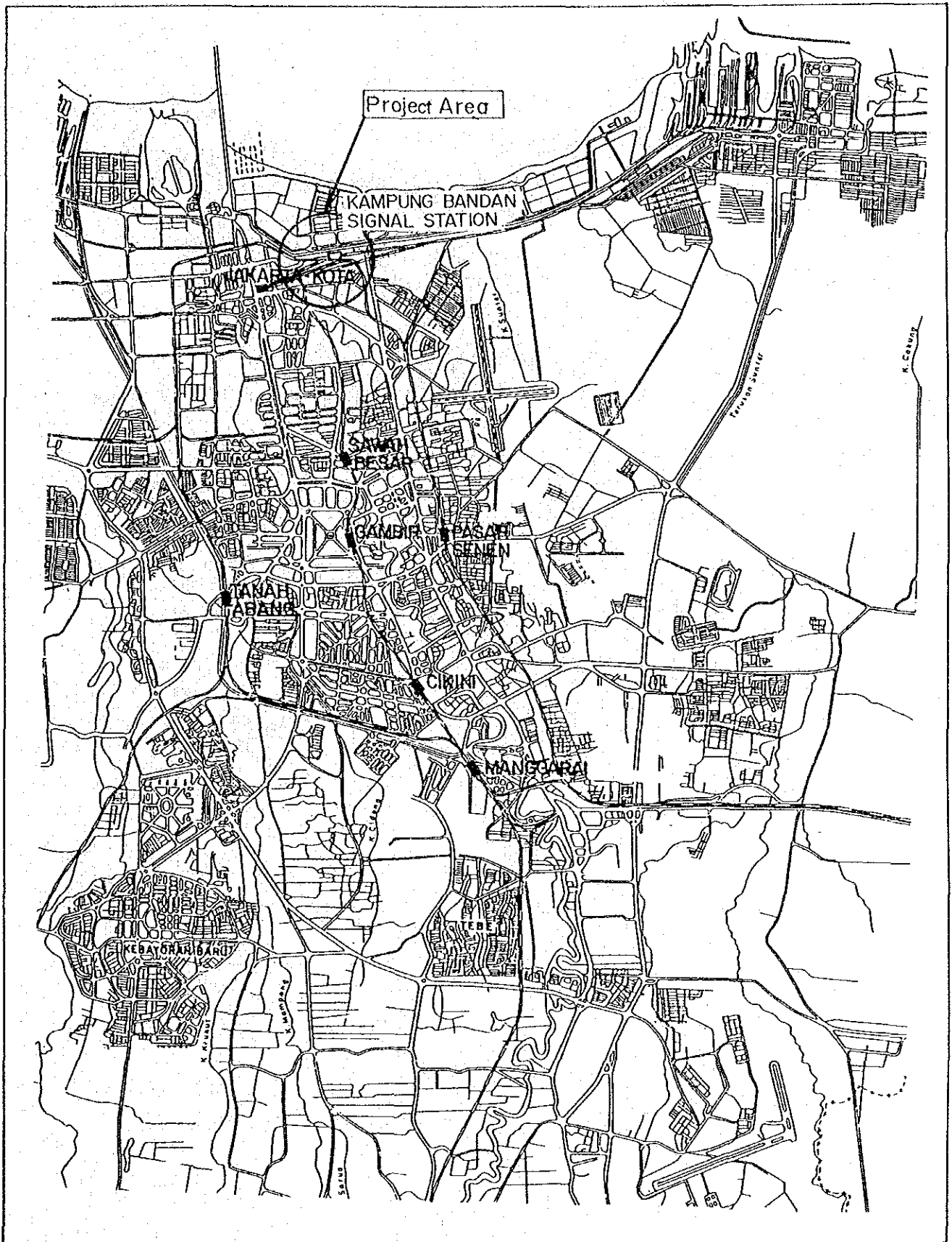
Mamoru TAKIYAMA
President
Japan Railway Technical Service



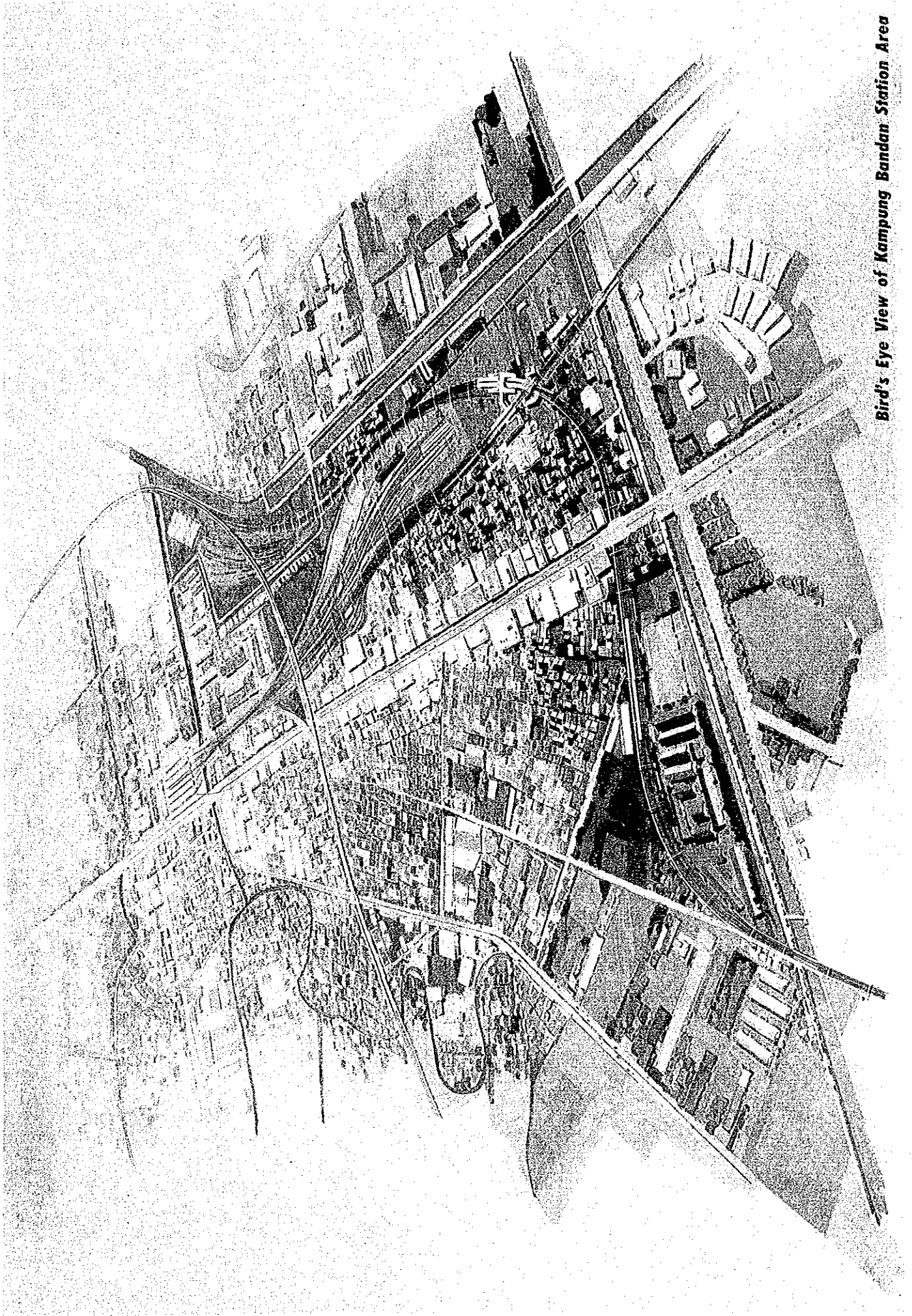
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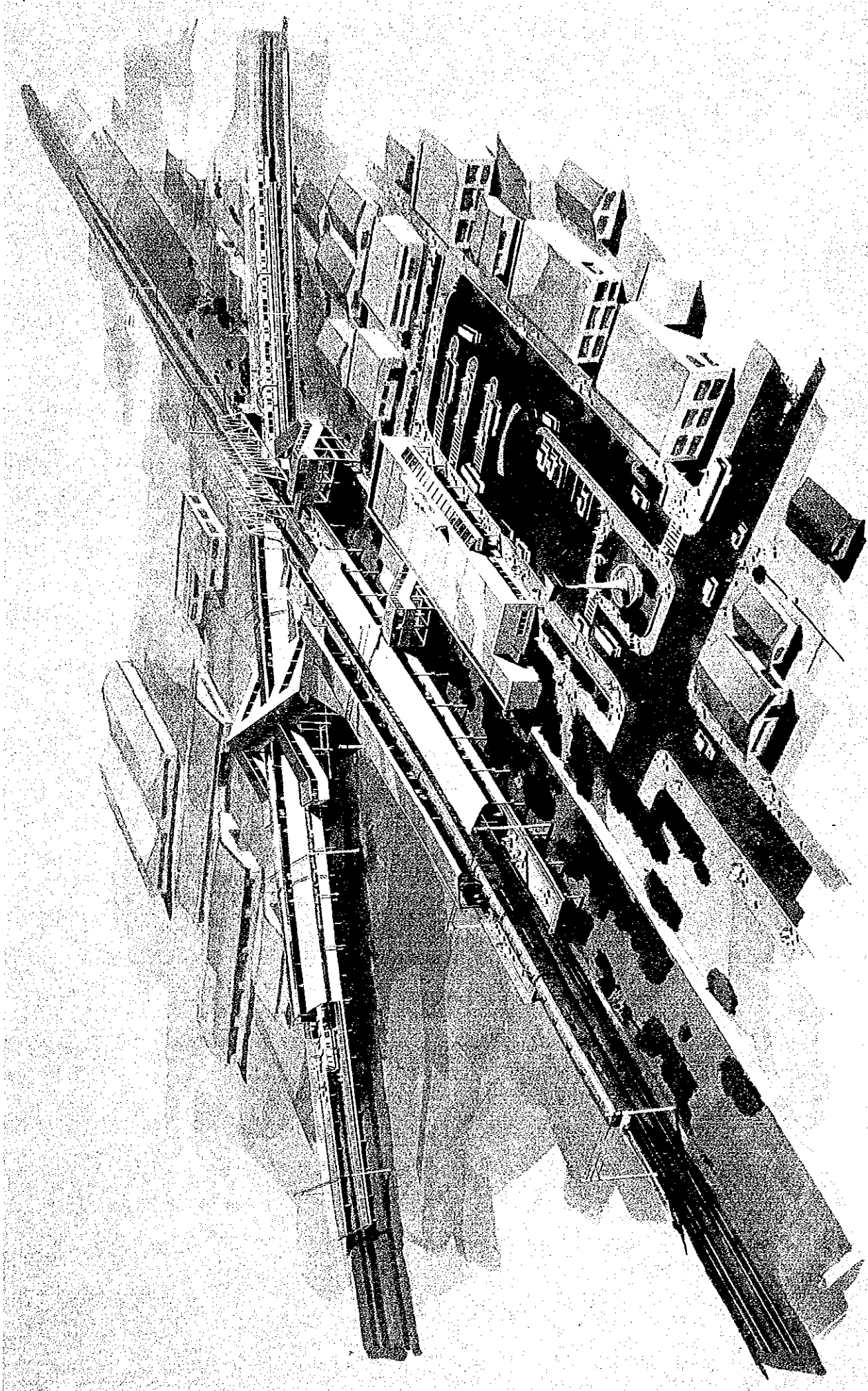
JABOTABEK



Project Location Map



Bird's Eye View of Kampung Bandan Station Area



New Kampung Bandan Station

CONTENTS

	<u>Page</u>
CHAPTER 1 INTRODUCTION	
1.1 Background of the Study	1
1.2 Objectives of the Study	3
1.3 Basic Policy of the Study	3
1.4 Schedule and Flow of the Study	4
1.5 Organizations Participating in the Study	8
CHAPTER 2 SOCIO-ECONOMIC FRAMEWORK	
2.1 Socio-Economic Framework of JABOTABEK Area	13
2.2 Population of JABOTABEK Area	15
2.3 Land Use	18
2.4 Current State of Transportation	25
2.4.1 Current State of Railways	25
2.4.2 Current State of Roads	30
CHAPTER 3 TRAFFIC DEMAND FORECAST	
3.1 Basic Concept	37
3.2 Preconditions	40
3.2.1 Zoning	40
3.2.2 Zonal Parameters	41
3.3 Traffic Demand Forecast	42
3.3.1 Future Person Trips Generated = Step - 1	42
3.3.2 Distribution of Mass Transit Person Trips = Step - 2	45
3.3.3 Modal Split between Railway and Bus = Step - 3	48

3.3.4	Future Railway Traffic Demand = Step - 4	52
3.3.5	Traffic Volume "Without Project"	58
3.3.6	Comparison of "With Project" and "Without Project"	60
CHAPTER 4 TRANSPORTATION PLAN		
(Western and Eastern Line Connection)		
4.1	Present Train Operation around Kampung Bandan Signal Station	63
4.1.1	General	63
4.1.2	Switchback Operation	64
4.1.3	Connection of Lines for Eliminating Switchback Operation	65
4.2	Improvement of Train Operation Route	69
4.2.1	Basic Concepts on Train Operation Planning	69
4.2.2	Assumptions	69
4.2.3	Train Operation Route	71
4.2.4	Train Formation and Headway	78
4.2.5	Rolling Stock Required	79
4.3	Control of Train Operation	80
4.3.1	General	80
4.3.2	Punctual Train Operation	80
4.3.3	Train Control	81
CHAPTER 5 RAILWAY FACILITY IMPROVEMENT PLAN		
(New Kampung Bandan Station)		
5.1	Current State of Kampung Bandan Station Area	83
5.1.1	Geographical Conditions	83
5.1.2	Present Conditions of Railway Facilities	83
5.2	Improvement Plan	94
5.2.1	Basic Concepts	94

5.2.2	Design Standard	94
5.2.3	Improvement Alternatives	99
5.2.4	Railway Facility Improvement Plan	102
5.2.5	Selection of Alternatives	110
5.3	Construction Work	113
5.3.1	Work Items	113
5.3.2	Essential Items	113

CHAPTER 6 INVESTMENT SCALE AND SCHEDULE

6.1	Investment Scale	117
6.1.1	Cost Estimate Assumptions	117
6.1.2	Cost Estimate	119
6.2	Investment Schedule	121

CHAPTER 7 ECONOMIC AND FINANCIAL ANALYSIS

7.1	Introduction	123
7.2	Economic Analysis	125
7.2.1	Methodology	125
7.2.2	Economic Cost Estimation	129
7.2.3	Benefit Estimation	133
7.2.4	Evaluation	137
7.2.5	Sensitivity Test	138
7.3	Financial Analysis	139
7.3.1	Methodology	139
7.3.2	Items Composing Cash Flow Statement	139
7.3.3	Results of Cash Flow Analysis	143
7.3.4	Evaluation	147

CHAPTER 8 RELATED FUTURE PLAN (New Jakarta Kota Station)

8.1	Future Requirements	149
8.2	Assumptions	151
8.2.1	Historical lessons	151
8.2.2	Options	151
8.3	Five Conceptual Alternatives	153
8.4	Validity of Conceptual Alternatives	162
8.5	Checking Project Validity from the Perspectives of Conceptual Alternatives	163
8.6	Delineation of Issues in a further Study	167
8.6.1	Railway's Viewpoint	167
8.6.2	City's Viewpoint	168

CHAPTER 9 CONCLUSION

9.1	Evaluation	171
9.1.1	Significance of the Project	171
9.1.2	Economic and Financial Evaluation	171
9.1.3	Concurrent Measures	171
9.2	Conclusion	172

APPENDICES

			<u>Page</u>
Appendix	3.1	Zone Code List	173
Appendix	3.2	Zone Division in DKI Jakarta	174
Appendix	3.3	Zone Division in BOTABEK Area	175
Appendix	3.4	Detailed Zone Code List	177
Appendix	3.5	Residential Population by Zone (estimated)	185
Appendix	3.6	Residential Population by Income Group in Jakarta (estimated)	189
Appendix	3.7	Estimated Land Uses by Zone in Jakarta	190
Appendix	3.8	Estimated Future Person Trips by Zone (Mass Transit)	191
Appendix	3.9	Integrated Zone Code List- The 20 zones A - T were integrated from 80 zones	192
Appendix	3.10	Estimated Future Person Trips by Zone (Railway) ..	193
Appendix	3.11	Estimated Future Person Trips by Zone (Bus)	194
Appendix	3.12	Estimated Distribution between Major Railway Stations (Year 2005)	195
Appendix	3.13	Railway Passenger Volume of Major Railway Links by Stage (All day and 2-hour peak) ..	196
Appendix	4.1	Number of Rolling Stock Required	198
Appendix	6.1	Simplification of Passenger Facilities in New Kampung Bandan Station	201
Appendix	7.1	Proportion of Electric Railcar (or Train) Kms within the Project Area to that of Entire JABOTABEK Area	205
Appendix	7.2	Construction Cost by Item for "Without Project" ..	206
Appendix	7.3	Economic Analysis for the F/S on the Railway Improvement in Kampung Bandan Station Area	208
Appendix	7.4	Financial Analysis for the F/S on the Railway Improvement in Kampung Bandan Station Area	214

TABLE LIST

		<u>Page</u>
Table 1.1	Schedule	6
Table 2.1	Population of JABOTABEK Area	15
Table 2.2	Project Population by Area (CASE II)	16
Table 2.3	Railway Network in the JABOTABEK Area	25
Table 2.4	Office Worker's Expectations of Railway	29
Table 2.5	Office Workers' Expectations of the Railway	30
Table 2.6	Road Conditions (as of the end of 1983)	32
Table 2.7	Average Speed of Buses DKI Jakarta	35
Table 3.1	Estimated Number of Future Person Trips Generated ...	42
Table 3.2	Estimated Future Share of Transportation Mode	43
Table 3.3	Estimated Future Person Trips by Mass Transit	44
Table 3.4	Railway Passenger Volume of Major Railway Links	56
	by Stage (All day and peak 2 hours)	
Table 3.5	Comparison of Railway and Bus Traffic volumes of	61
	"With Project" and "Without Project"	
Table 4.1	Comparison and Evaluation of Line Combinations	68
Table 4.2	Comparison and Evaluation of Train Route Alternatives ..	72
	1, 2, and 3	
Table 4.3	Number of Railcars Required (Whole JABOTABEK Area) .	79
Table 5.1	Design Standard (for Improvement of Kampung Bandan ..	95
	Station Area)	
Table 5.2	Comparison of Alternatives from Viewpoint of	100
	Railway Facility Plan	
Table 5.3	Comparison of P ₁₋₁ & P ₁₋₂	111
Table 5.4	Estimated Construction Cost	112
Table 6.1	Classification in Foreign and Local Currencies	118

Table 6.2	Estimated Costs	120
Table 6.3	Investment Schedule	121
Table 7.1	Framework for Economic Analysis	128
Table 7.2	Investment Costs (Economic Price)	130
Table 7.3	Maintenance Ratio and Useful Life of Assets	131
Table 7.4	Unit Price for Operating and maintenance Cost	132
Table 7.5	Rolling Stock and Costs Saved	133
Table 7.6	Buses and Costs Saved	134
Table 7.7	Time-Saving Benefit for Railway Passengers	135
Table 7.8	Results of Sensitivity Test (EIRR)	138
Table 7.9	Additional Traffic Volume	139
Table 7.10	Financial Cost of Investment	141
Table 7.11	Fund Raising Plan	142
Table 7.12	Government Subsidy to Cover Operating Deficit	143
Table 7.13	Cash Flow Result for Each Case	145
Table 8.1	Combination of Options	153
Table 8.2	Conceptual Alternatives	154

FIGURE LIST

			<u>Page</u>
Fig. 1.1	Flow of the Study	.....	7
Fig. 2.1	Administrative Boundary of JABOTABEK Area	.....	13
Fig. 2.2	Industrial Structure in 1980 (Population 10 years of age and over)	.....	14
Fig. 2.3	Population Growth DKI Jakarta	.....	17
Fig. 2.4	Major Geographical Features of JABOTABEK Area by Zone	.....	20
Fig. 2.5	Land Use Plan: JABOTABEK 2005	.....	21
Fig. 2.6	Major Geographical Features of DKI Jakarta Area by Zone	.....	22
Fig. 2.7	Land Use Plan, DKI Jakarta 2005	.....	23
Fig. 2.8	Future Land Use Plan around Jakarta Kota Station	....	24
Fig. 2.9	Map of JABOTABEK Area Railway Network	.....	26
Fig. 2.10	Passenger Traffic fluctuation at Jakarta Kota Station	..	27
Fig. 2.11	Egress Time and Mode Used from Jakarta Kota Station	.	28
Fig. 2.12	Commutation by Mode	.....	29
Fig. 2.13	Road Network in DKI Jakarta	.....	31
Fig. 2.14	Number of Vehicles by Type, DKI Jakarta 1974-1982	...	32
Fig. 2.15	Traffic Volume Fluctuations around Jakarta Kota Staion	.....	33
Fig. 2.16	Traffic Volume Fluctuations aroun Kota Intan Area	....	34
Fig. 3.1	Process Flow Chart for Traffic Demand Forecast	.....	39
Fig. 3.2	Desire Traffic Lines of Person Trips by Mass Transit between DKI Jakarta and Othe Zones, 1995	...	46
Fig. 3.3	Desire Traffic Lines of Person Trips by Mass Transit inside DKI Jakarta, 1995	...	46

Fig. 3.4	Desire Traffic Lines of Person Trips by Mass Transit ... between DKI Jakarta and Othe Zones, 2005	47
Fig. 3.5	Desire Traffic Lines of Person Trips by Mass Transit ... inside DKI Jakarta, 2005	47
Fig. 3.6	Modal Split Curve between Railway and Bus	48
Fig. 3.7	Estimated Future Person Trips by Transportation Mode .	51
Fig. 3.8	Desire Traffic Lines of Railway Passengers, 1995	53
Fig. 3.9	Desire Traffic Lines of Railway passengers, 2005	53
Fig. 3.10	Estimated Railway Passenger Volume (With)	55
Fig. 3.11	Passenger Flow around Kampung Bandan Station Area (With)	57
Fig. 3.12	Estimated Railway Passenger Volume (Without)	59
Fig. 3.13	Passenger Flow around Kampung Bandan Station Area (Without)	58
Fig. 4.1	Schematic Layout of Kampung Bandan Signal Station ...	64
Fig. 4.2	Combination of Lines	67
Fig. 4.3	Forecasted Traffic Flows (Whole day and peak 2 Hrs in thousands)	70
Fig. 4.4	Long-Distance Passenger Train Route	76
Fig. 4.5	Freight Train Routes	77
Fig. 4.6	Train Headway and Number of Railcar for Each Train .. Set (Peak 2 Hrs.)	78
Fig. 5.1	Location Map	84
Fig. 5.2	Present Track Layout	85
Fig. 5.3	Inundation Area	86
Fig. 5.4	Present Jakarta Kota Station	88

Fig. 5.5	Bridge (No. 252)	91
Fig. 5.6	Roadway Diagram	96
Fig. 5.7	Construction Gauge	97
Fig. 5.8	Standard Mounting	98
Fig. 5.9	Access Route to Jakarta Kota Station from Eastern Line	101
Fig. 5.10	Track Layout	103
Fig. 5.11	Station Facility Plan (P ₁₋₁)	106
Fig. 5.12	Station Facility Plan (P ₁₋₂)	107
Fig. 5.13	Track Raising (Tanjung Priok Line)	115
Fig. 5.14	Cross Section of the Embankment (Tanjung Priok Line) .	115
Fig. 7.1	Cost and Benefit in Each Year	137
Fig. 7.2	Operating Revenue and Expenses in Each Year	143
Fig. 7.3	Cumulative Net Cash Flow	146
Fig. 8.1 (1)	Representation of Conceptual Alternative 101	155
Fig. 8.1 (2)	Representation of Conceptual Alternative 102-1	156
Fig. 8.1 (3)	Representation of Conceptual Alternative 102-2	157
Fig. 8.1 (4)	Representation of Conceptual Alternative 102-3	158
Fig. 8.1 (5)	Representation of Conceptual Alternative 103	159
Fig. 8.1 (6)	Representation of Conceptual Alternative 104	160
Fig. 8.1 (7)	Representation of Conceptual Alternative 105	161
Fig. 8.2	Flow of Improvement Planning	162

Abbreviation in alphabetical order

Ae	Ancol
Ak	Angke
Boo	Bogor
Bks	Bekasi
C	Central Line
CA	Cengkareng Airport Line
Dp	Depok
Du	Duri
E	Eastern Line
Gmr	Gambir
Jak	Jakarta Kota
Jakg	Jakarta Gudang
JIAC	Jakarta International Airport, Cengkareng
Jng	Jatinegara
Jyk	Jayakarta
Kpb	Kampung Bandan
Mri	Manggarai
NKpb	New Kampung Bandan
Pse	Pasar Senen
Rjw	Rajawali
Srp	Serpong
T	Tanjung Priok Line
Thb	Tanah Abang
Tng	Tangerang
Tpk	Tanjung Priok
Tpg	Tanjung Priok Gudang
W	Western Line

CHAPTER 1 INTRODUCTION

CONTENTS

	<u>Page</u>
1.1 Background of the Study	1
1.2 Objectives of the Study	3
1.3 Basic Policy of the Study	3
1.4 Schedule and Flow of the Study	4
1.5 Organizations Participating in the Study	8

CHAPTER 1 INTRODUCTION

1.1 Background of the Study

(1) Transportation in the JABOTABEK Area

The JABOTABEK Area consists of DKI Jakarta, Kabupaten Bogor, Kabupaten Tangerang and Kabupaten Bekasi, and is the political and economic center of Indonesia. Brisk industrial and economic activities have contributed to the rapid growth of the Area's population, which reached 12 million in 1980, and is projected to reach 19 million and 23 million in 1995 and 2005 respectively.

Although a railway network exists in the Area, its potential to function as an adequate urban transportation system has not yet been fully realized. This is due mainly to superannuation and inadequate maintenance of the railway facilities.

Road vehicles have accounted for most of the traffic growth in the Area. This has aggravated road traffic congestion, and compounded the problems of traffic accidents and air pollution. Furthermore, it is impossible to improve the road network to the extent that it will ever satisfy the future increases in traffic demand.

(2) Improvement Plans

The Government of Indonesia has recognized the need for an urban railway system featuring mass transportation, safety, high speed, punctuality, and energy-efficiency. The rehabilitation of the railway system began with the "Intermediate Program" in 1977. A railway transportation "Master Plan" was drawn up in 1981 with assistance from the Japan International Cooperation Agency (JICA), the official agency of the Government of Japan responsible for international technical cooperation. The Government of Indonesia

decided to embark on the Master Plan, which was to last until the year 2000, but decided to shorten it by about ten years.

Subsequently, in compliance with the Master Plan, a series of feasibility studies were carried out until 1984. They are mainly as follows:

- 1) Track Addition on the Central Line between Manggarai and Depok
- 2) Establishment of the New Depot at Depok
- 3) Electrification of the Bekasi Line
- 4) Track Elevation of the Central Line between Jakarta Kota and Manggarai
- 5) New Railway Construction for Cengkareng Airport
- 6) Grade Separated Crossing in Manggarai Station
- 7) Track Addition and Other Improvements on the Merak Line
- 8) Track Addition and Other Improvements on the Tangerang Line

The Master Plan and its accompanying improvement plans focused on the efficient utilization of existing railway lines for the urban transportation system.

The Government of Indonesia established the Coordination Steering Committee and the Project Management Group (PMG), the executive agency, in 1982.

(3) Railway Improvement in the Kampung Bandan Station Area

The above-mentioned studies referred to the importance of railway improvement in the Kampung Bandan Station Area, and the Government of Indonesia requested a feasibility study on it to the Government of Japan, which accepted it and dispatched a Preliminary Study Team in August, 1984.

This Report was prepared in accordance with the Scope of Work agreement concluded on 4 August 1984 between the Government of Indonesia and the Team.

1.2 Objectives of the Study

The Study will outline plans for streamlining train operation, increasing passenger handling capacity, and will serve to evaluate the economic and financial feasibility of the planned investments for the railway improvement in the Kampung Bandan Station Area.

1.3 Basic Policy of the Study

In accordance with the above-mentioned background and objectives, this Study will proceed with appropriate consideration given to the following:

- 1) Respect for the Master Plan and subsequent studies conducted thus far, and for the Master Program now being authorized by the Indonesian side
- 2) Emphasis on urban transportation, while taking into account freight and long-distance passenger transportation
- 3) Efficiency of transportation
 - a) Elimination of the switchback operation of Western Line commuter trains at Kampung Bandan Signal Station
 - b) Achieving easier connections between the lines which pass through the Kampung Bandan Station Area
 - c) Balancing the railway traffic volumes among the Central, Western, and Eastern Lines.
- 4) Efficiency of investment
 - a) Maximum utilization of the existing railway facilities
 - b) Designing the construction so as to minimize any structural alterations or modifications which might possibly pose obstacles for new future plans

1.4 Schedule and Flow of the Study

- 1) Preparatory work in Japan
 - a) Examination of data already collected

- b) Discussion on the study's methodology
- c) Preparation of the Inception Report
- 2) Work in Indonesia (1)
 - a) Presentation and explanation of the Inception Report
 - b) Obtaining comments from the Indonesian authorities concerned
 - c) Collection of data and information
 - d) Preliminary field survey
- 3) Work in Japan (1)
 - a) Examination of available data and information
 - b) Examination of field survey results and comments from the Indonesian side
- 4) Work in Indonesia (2)
 - a) Additional collection of data and information
 - b) Further detailed field survey
 - c) Discussion on the framework of the future investment strategy with authorities concerned
 - d) Obtaining additional comments from the Indonesian side
 - e) Making out the Field Study Report concerning the basic study items
- 5) Work in Japan (2)
 - a) Overall and integrated analysis of the work results obtained in Indonesia
 - b) Railway traffic demand forecast
 - c) Planning
 - Train operation
 - Rolling stock
 - Railway facilities
 - d) Preparation of the Interim Report

- 6) Work in Indonesia (3)
Presentation, explanation, and discussion of the Interim Report in Indonesia
- 7) Work in Japan (3)
 - a) Adjustment of the Interim Report based on comments from the Indonesian side
 - b) Cost estimation
 - Train operation
 - Rolling stock
 - Construction
 - Operating and Maintenance
 - c) Establishment of investment scale and schedule
 - d) Economic analysis, financial analysis, and evaluation
 - e) Preparation of the Draft Final Report
- 8) Final work in Indonesia (4)
Presentation, explanation, and discussion of the Draft Final Report in Indonesia
- 9) Final work in Japan (4)
 - a) Adjustment of the Draft Final Report based on comments to be submitted from the Indonesian side
 - b) Preparation and submission of the Final Report

A work schedule and flow of the Study is shown in Table 1.1 and Fig. 1.1.

Table 1.1 Schedule

Items	Date	1984			1985												1986	
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	
1) Preparatory Work in Japan		□																
2) Work in Indonesia (1) Inception Report			■															
3) Work in Japan (1)				□														
4) Work in Indonesia (2) Field Study Report					■													
5) Work in Japan (2)						□	□	□										
6) Work in Indonesia (3) Interim Report										■								
7) Work in Japan (3)											□	□	□					
8) Final Work in Indonesia (4) Draft Final Report																■		
9) Final Work in Japan (4)																	□	
10) Final Report																		○

Remarks: □ : Work in Japan
 ■ : Work in Indonesia
 ○ : Submission of Report

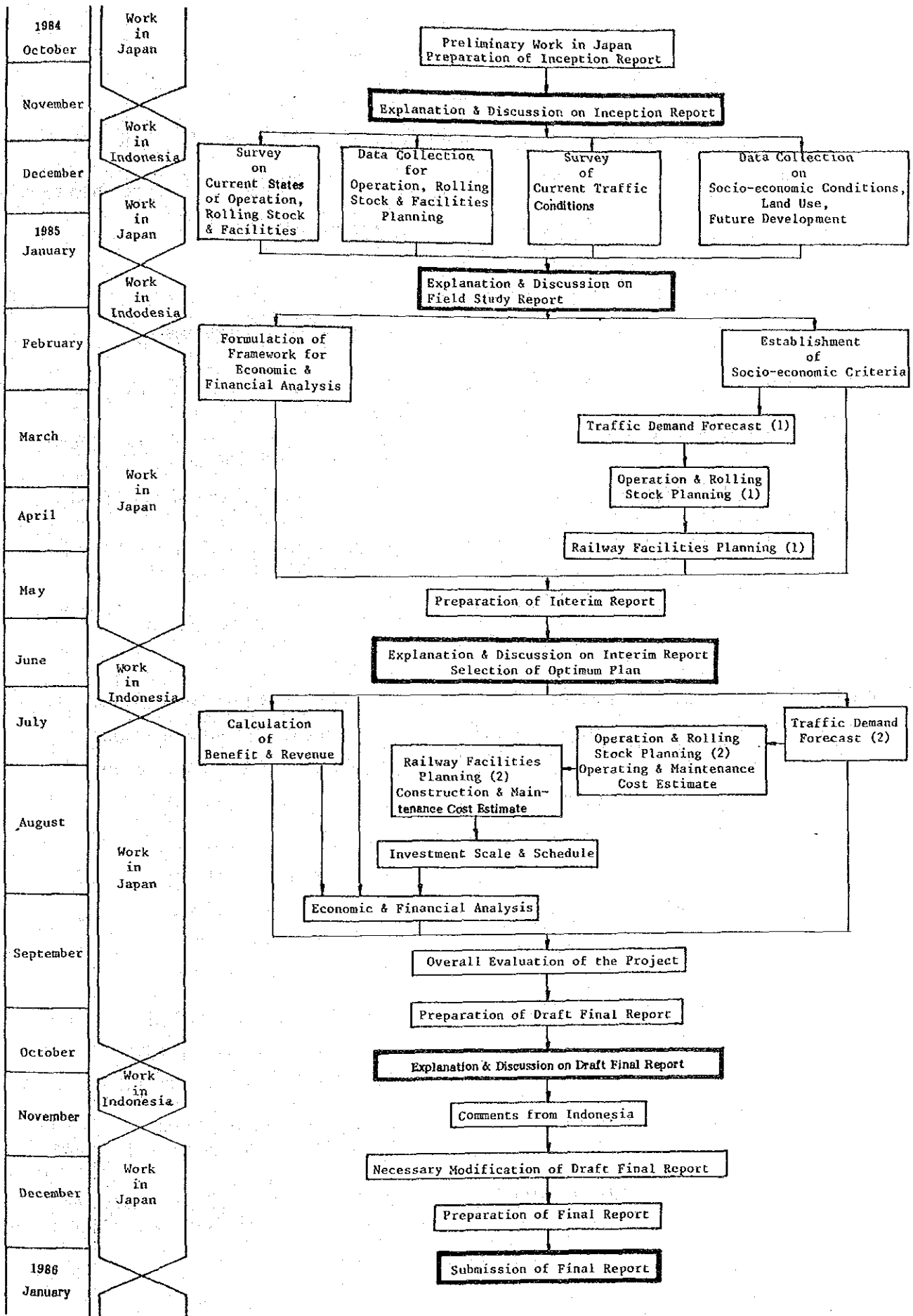


Fig. 1.1 Flow of the Study

1.5 Organizations Participating in the Study

The Indonesian Steering Committee, counterparts, JICA Advisory Committee, and the Study Team are as follows:

(1) Indonesian Steering Committee

<u>Name</u>	<u>Name of organization</u>
Ir. GIRI S. HADIHARDJONO MSE	Directorate General of Land Transport and Inland Waterways
GATOT SOEDJANTOKO	Directorate General of Land Transport and Inland Waterways
Drs. DARMAWAN TAS'AN	Directorate General of Land Transport and Inland Waterways
Ir. DJAUHARI PERANGIN-ANGIN	Directorate General of Land Transport and Inland Waterways
Ir. MULYADI HADIKUSUMO	Directorate General of Land Transport and Inland Waterways
Ir. SOENARYO	Department of Communications
Ir. FAHRAN TANJUNG	Department of Communications
Ir. L. DENNY SIAHAAN MSC	Department of Communications
Drs. MANGATAS	Department of Communications
Ir. EDDY RUSLANI	Indonesian State Railways
Ir. BAMBANG ADI PRATIGNYO	Indonesian State Railways
TUGIMAN	Indonesian State Railways
MASDJUD H.	Indonesian State Railways
SOEDAGYO	Indonesian State Railways
JAYA KARTAWIRIA	Indonesian State Railways
Ir. PANTIARSO	JABOTABEK Railway Project
Ir. SOEPARTO	JABOTABEK Railway Project
Ir. ZULFIAR S.	JABOTABEK Railway Project
MARULI SIAHAAN	Center of Research and Development Land Transport and Inland Waterways
Drs. FREDDY RORIMPANDE	Center of Research and Development Land Transport and Inland Waterways

Drs. ARIF SALIM	Center of Research and Development Land Transport and Inland Waterways
HARRY PRAYITNO	Directorate of Urban Transport Directorate General of Land Transport and Inland Waterways
Drs. GUNARWAN	Directorate of Urban Transport Directorate General of Land Transport and Inland Waterways
Ir. SYARIFUDDIN AKIL	Directorate General of Housing and Building
Ir. S. HANDHAYANI	BAPPEDA DKI Jakarta
A. TAMURA	Advisory Team to Directorate General of Land Transport and Inland Waterways
K. KURAUCHI	Advisory Team to Directorate General of Land Transport and Inland Waterways
M. YOSHIDA	Advisory Team to Directorate General of Land Transport and Inland Waterways
N. FUKUI	Advisory Team to Directorate General of Land Transport and Inland Waterways
H. NISHIJIMA	Advisory Team to Directorate General of Land Transport and Inland Waterways

(2) Indonesian Counterparts

<u>Name</u>	<u>Assignment</u>	<u>Name of organization</u>
Ir. DJAUHARI	Project Officer	PHBD
Ir. MULYADI	Administrator Economic Analysis	PHBD
Ir. MARNALOM	City Planning	PHBD
Ir. PARLINDUNGAN TARIGAN	City Planning	PHBD
Drs. BADAR ZAENIE	Traffic Demand Forecast	PMG
SOENARDJO	Traffic Demand Forecast	PJKA
TOHIR KARTABRATA	Train Operation Planning	PMG
SUHARTO	Train Operation Planning	PJKA
Dipl. Ing. MURDIWAN	Rolling Stock/Work Shop Planning	PMG
NUGROHO	Rolling Stock/Work Shop Planning	PJKA
Ir. NICO DH. DJAJASINGA	Civil Engineering	PMG
Ir. WAHJUDI	Civil Engineering	PJKA
Ir. NUGROHO	Station Planning	PMG
SOEWARNNO	Station Planning	PJKA
Ir. SYAHRIAR BACHTIAR	Electrification Planning	PMG
SOEKISWO	Electrification Planning	PJKA
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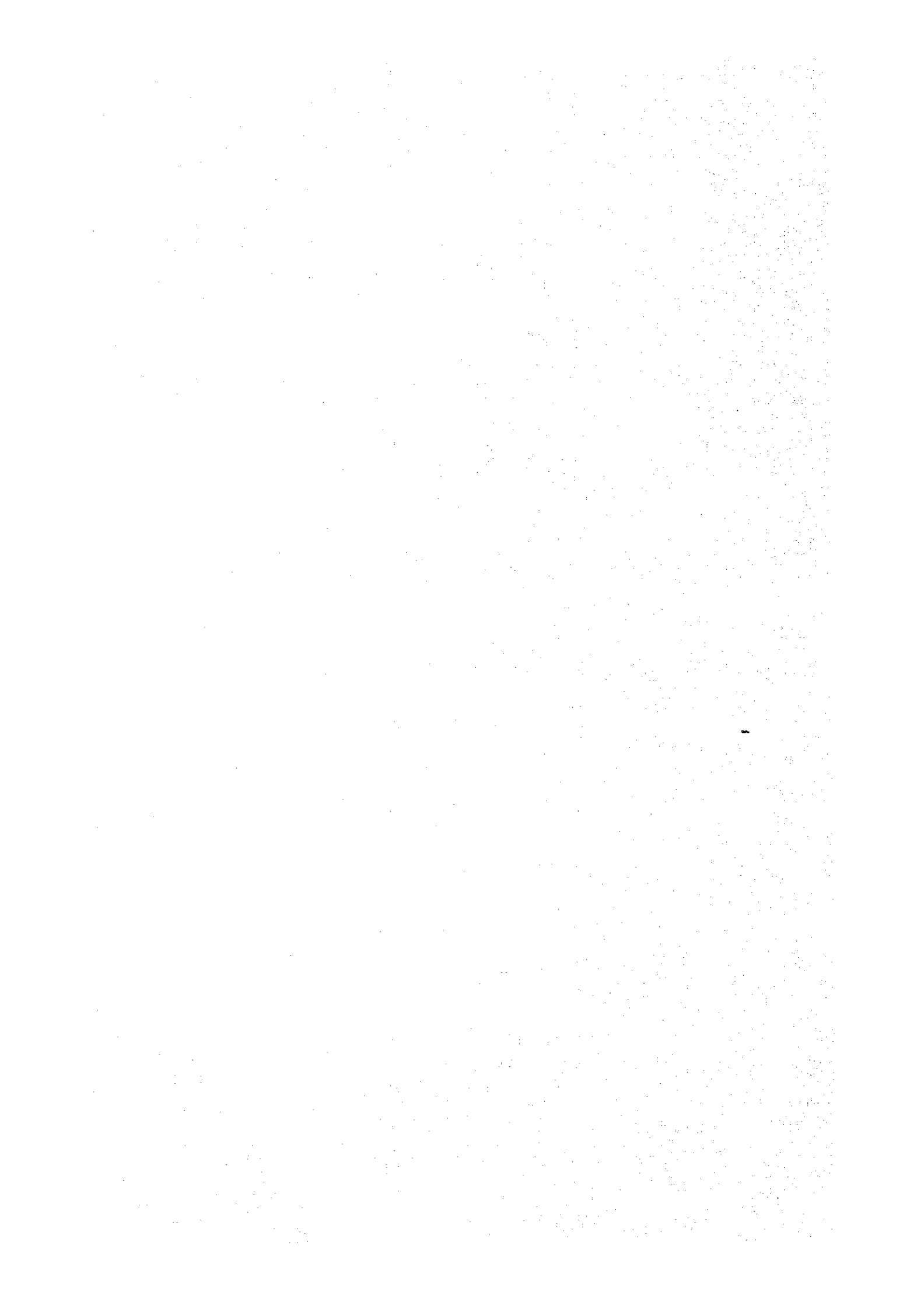
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CHAPTER 2 SOCIO-ECONOMIC FRAMEWORK

CONTENTS

	<u>Page</u>
2.1 Socio-Economic Framework of JABOTABEK Area	13
2.2 Population of JABOTABEK Area	15
2.3 Land Use	18
2.4 Current State of Transportation	25
2.4.1 Current State of Railways	25
2.4.2 Current State of Roads	30



CHAPTER 2 SOCIO-ECONOMIC FRAMEWORK

2.1 Socio-Economic Framework of JABOTABEK Area

DKI Jakarta is situated at the western tip of Java Island.

The JABOTABEK Area consists of DKI Jakarta and its surrounding areas of Kabupaten Bogor, Kotamadya Bogor, Kabupaten Tangerang, and Kabupaten Bekasi. The administrative districts in Indonesia are as follows:

- 1) Propinsi
- 2) Kabupaten or Kotamadya
- 3) Kecamatan
- 4) Kelurahan

DKI Jakarta is a propinsi consisting of 30 kecamatan and 237 kelurahan.

Kabupaten Bogor has 24 kecamatan; Kotamadya Bogor, 5 kecamatan;

Kabupaten Tangerang, 17 kecamatan; and Kabupaten Bekasi, 13 kecamatan.

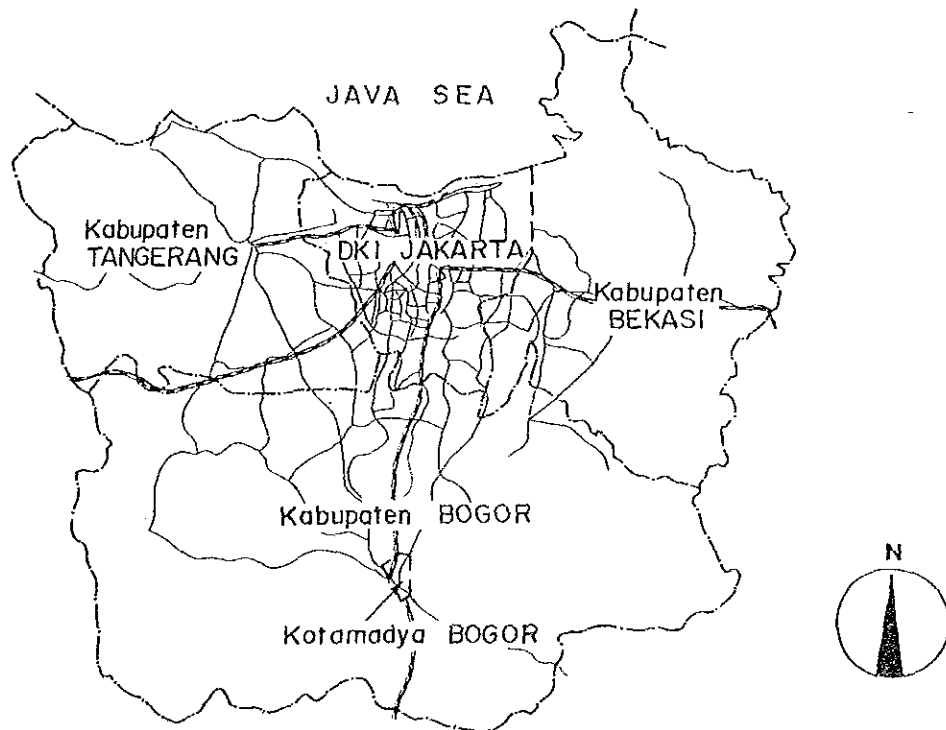
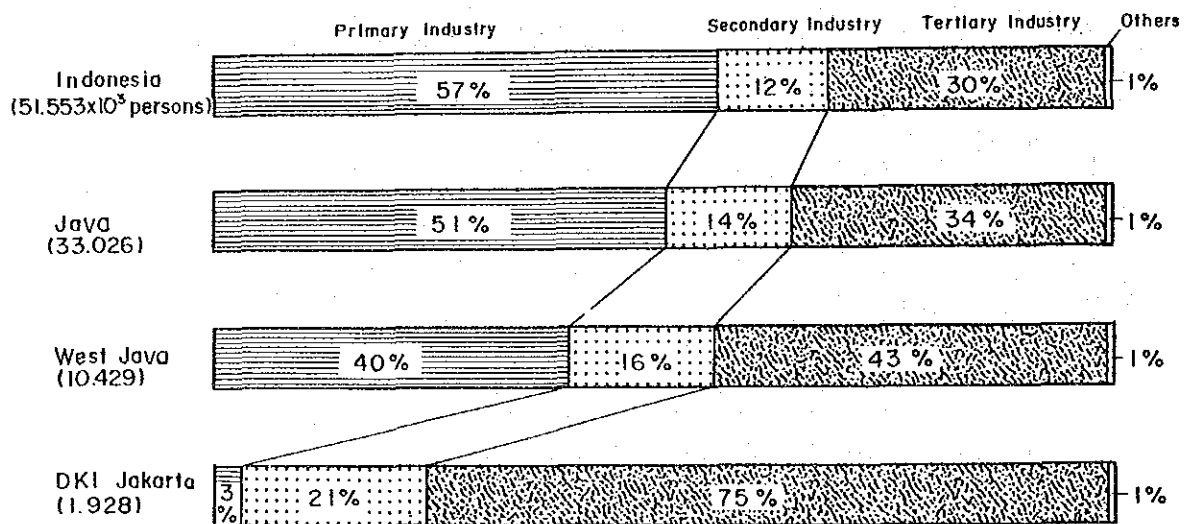


Fig. 2.1 Administrative Boundaries of JABOTABEK Area

The Kampung Bandan Station Area, including the Jakarta Kota Station, is located at Kelurahan Mangga Dua Utara in Kecamatan Penjaringan, and forms the small northern tip of DKI Jakarta. Because many railway lines converge there, it plays a key role in the railway network of the JABOTABEK Area.

The metropolitan JABOTABEK Area, DKI Jakarta in particular, is a key political and economic center of the Republic of Indonesia. Most people in DKI Jakarta are engaged in secondary and tertiary industries; this is in contrast with the overall national industrial structure in which a sizeable majority work in primary industry (see Fig. 2.2).



- 1) Primary industry : Agriculture, Forestry, Fishing, Mining
- 2) Secondary industry : Manufacturing industry, Construction
- 3) Tertiary industry : Commerce, Trade, Transportation, Financing, Public service

Source: Statistical Yearbook of Indonesia, 1983.

Fig. 2.2 Industrial Structure in 1980 (Population 10 years of age and over)

2.2 Population of JABOTABEK Area

The figures for the Area's population for the past four years are shown in Table 2.1.

Table 2.1 Population of JABOTABEK Area

District	Area	Items	1980	1981	1982	1983
INDONESIA	1,919,443 km ²	Population (10 ³ persons)	147,490	151,315	154,662	158,083
		Growth rate (%)	-	2.6	2.2	2.2
		Population density (persons per km ²)	77	79	81	82
JABOTABEK TOTAL	6,298 km ²	Population	11,865	12,241	12,588	12,923
		Growth rate	-	3.2	2.8	2.7
		Population density	1,884	1,944	1,999	2,052
DKI Jakarta	590 km ²	Population	6,503	6,778	7,038	7,307
		Growth rate	-	4.2	3.8	3.8
		Population density	11,022	11,488	11,929	12,385
Kabupaten Bogor & Kotamadya Bogor	3,380 km ²	Population	2,748	2,769	2,804	2,827
		Growth rate	-	0.8	1.3	0.8
		Population density	813	819	830	836
Kabupaten Tangerang	1,044 km ²	Population	1,490	1,523	1,562	1,586
		Growth rate	-	2.2	2.6	1.5
		Population density	1,427	1,459	1,496	1,519
Kabupaten Bekasi	1,284 km ²	Population	1,124	1,171	1,184	1,203
		Growth rate	-	4.2	1.1	1.6
		Population density	875	912	922	937

Sources: 1) Statistical Yearbook of Indonesia 1983
2) Population of West Java by Kecamatan 1983

These figures show that 8% of the national population is concentrated in this Area, which comprises only 0.3% of the total land area of Indonesia. The population density, especially that of DKI Jakarta, is remarkably high when compared with the national average of 80 persons per square kilometer.

The uneven distribution of population gives rise to a variety of social problems, including unemployment, substandard housing, deteriorating public services, traffic congestion, pollution, and crime. Nevertheless, many new arrivals to the Area flow in from rural areas every year, attracted by easy access to public services, job opportunities, and higher incomes.

For years, the Government of Indonesia has been promoting a national transmigration policy to disperse population and cultivate new areas. Moreover, the Government intends to reduce the population growth rate to under 2% by the end of the Fourth 5-Year Plan (1984 -1989).

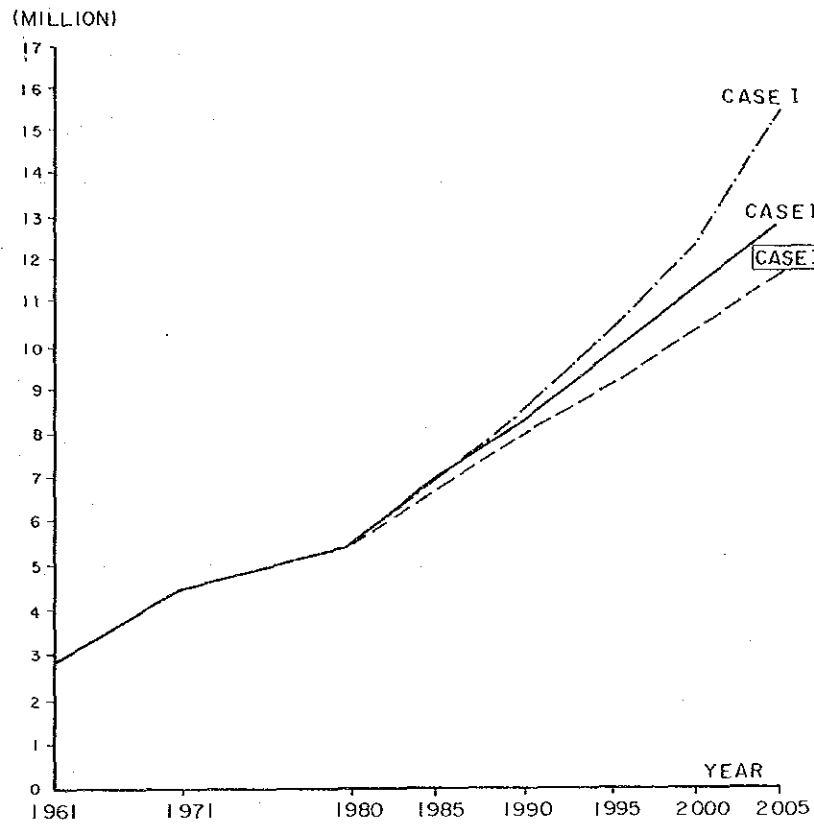
In keeping with these policies, the DKI Jakarta Authority examined 3 cases and took into account a variety of factors (gross birth rate, gross death rate, natural increase rate, migration, etc.). Its goal is "Case II", which has the lowest growth rate (see Fig. 2.3). Furthermore, the Authority seeks to attract a part of the population to the "East" and "West" areas from the other areas of DKI Jakarta (see Table 2.2).

Table 2.2 Projected Population by Area (CASE II)

Development Area	Area (ha)	Population (10 ³ persons)		
		1980	2005	1980-2005
Northwest	8,070	251	689	+438
North	8,470	2,020	2,411	+391
Northeast	7,710	187	664	+477
Tanjnug Priok	3,340	543	897	+354
<u>West</u>	7,540	485	1,937	<u>+1,452</u>
Central	7,740	1,393	2,128	+735
<u>East</u>	8,630	1,060	2,187	<u>+1,127</u>
South	12,950	530	1,075	+545
TOTAL DKI JAKARTA	64,450	6,469	11,988	+5,519

Note : "+" indicates the increase in population between 1980 and 2005.

Source : Master Plan DKI 2005



Source: Proyeksi Penduduk DKI Jakarta 1980 - 2005

Fig. 2.3 Population Growth in DKI Jakarta

2.3 Land Use

(1) Land Use in JABOTABEK Area

As stated previously, the DKI Jakarta Area is already showing the strains of overpopulation. Industrial activities and housing development should include to other BOTABEK areas, not only to solve this maldistribution, but also to develop those areas.

The JABOTABEK Area is divided into five lateral zones based on socio-economic and geographical perspectives. The new industrial centers and housing areas stretch out towards the east and west. Governmental restrictions on development in the southern area, where limited water resources must be preserved, have limited growth there.

Features of the JABOTABEK Area are shown in Figs. 2.4 and 2.5.

(2) Land Use in DKI Jakarta

Ninety percent of DKI Jakarta residents live in substandard housing in "Kampung." Futhermore, this problem is exacerbated by the perpetual flow of squatters whose presence multiplies urban problems and further deteriorates living conditions.

In accordance with national policy, the DKI Jakarta Authority intends to disperse industrial activities and population by stressing development in the east and west, and limiting development in some areas of the northern and central parts of DKI Jakarta. The southern area, because of its importance as a reservoir of water for the other areas of the city, has less development potential.

Regarding the use of the land at the Kemayoran Airport site after its closing, several plans exist, but a final decision has yet to be announced.

The DKI Jakarta land-use plan is shown in Figs. 2.6 and 2.7.

(3) Land Use around Kampung Bandan Station Area

Land use in the Jakarta Kota Area lags behind in efficiency, with many dilapidated houses and warehouses still remaining. However, the Area will not be deprived of its position as a major business and commercial center.

The DKI Jakarta Authority is now promoting the Development Plan of the Kota Area with the aim to develop it into a modern business and commercial district. Under this Plan, it has been decided to move warehouses to Cakung and Pluit. And the Jl. Mangga Dua Project, which is now under way, will connect the two roads Jl. Gunung Sahari and Jl. Jembatan Batu, as well as remove superannuated and illegally built/located houses. When this is accomplished, a modern business and commercial area will be developed along the road Jl. Mangga Dua. Easy access roads to the new Kampung Bandan Station will also be provided.

Concerning the Jakarta Harbour Road Project, there are some alternative routes, but the related report recommends a route which will not interfere with the Railway Improvement in Kampung Bandan Station Area.

Future land use around the Kampung Bandan Station Area is shown in Fig. 2.8.

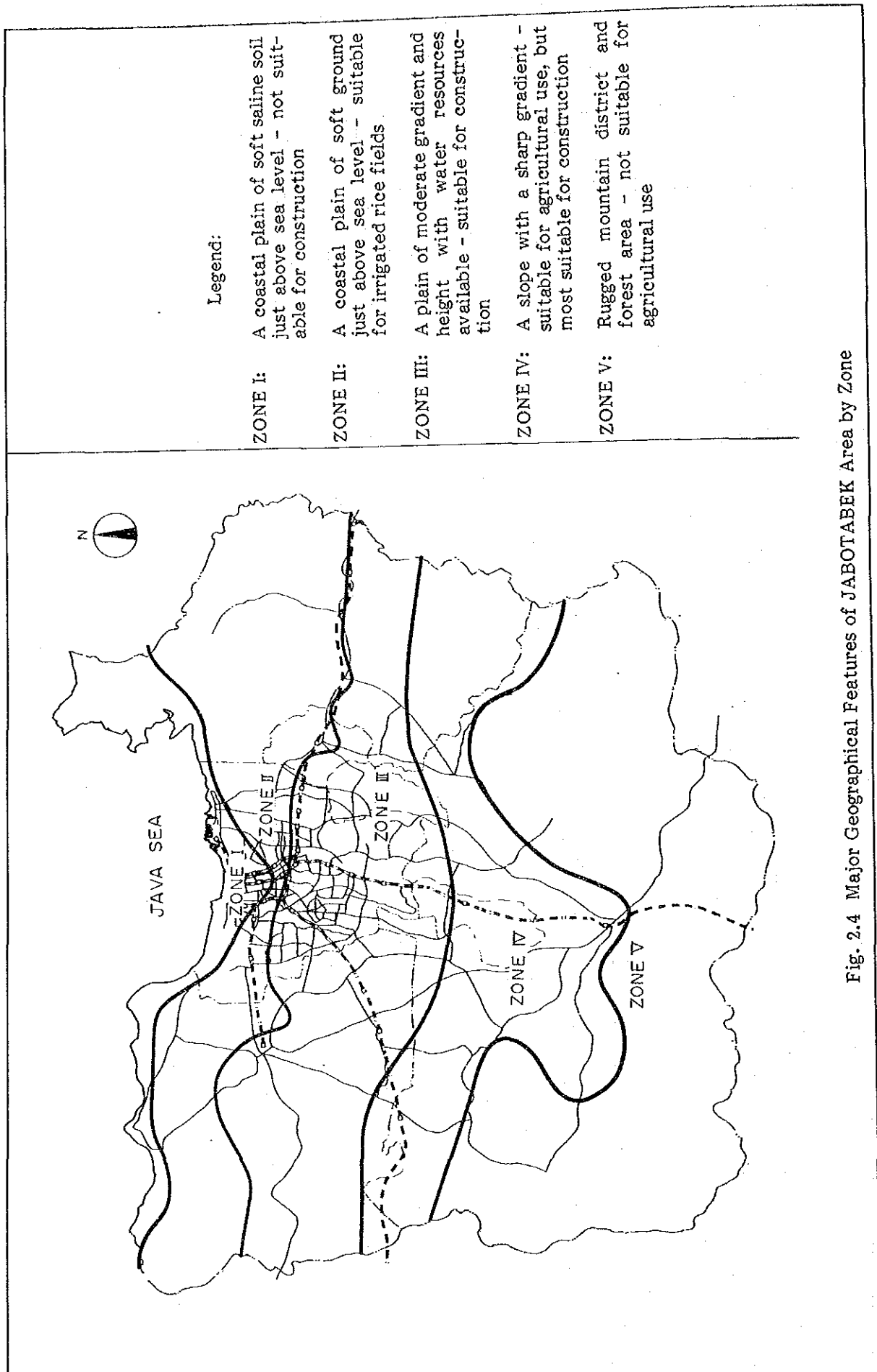


Fig. 2.4 Major Geographical Features of JABOTABEK Area by Zone

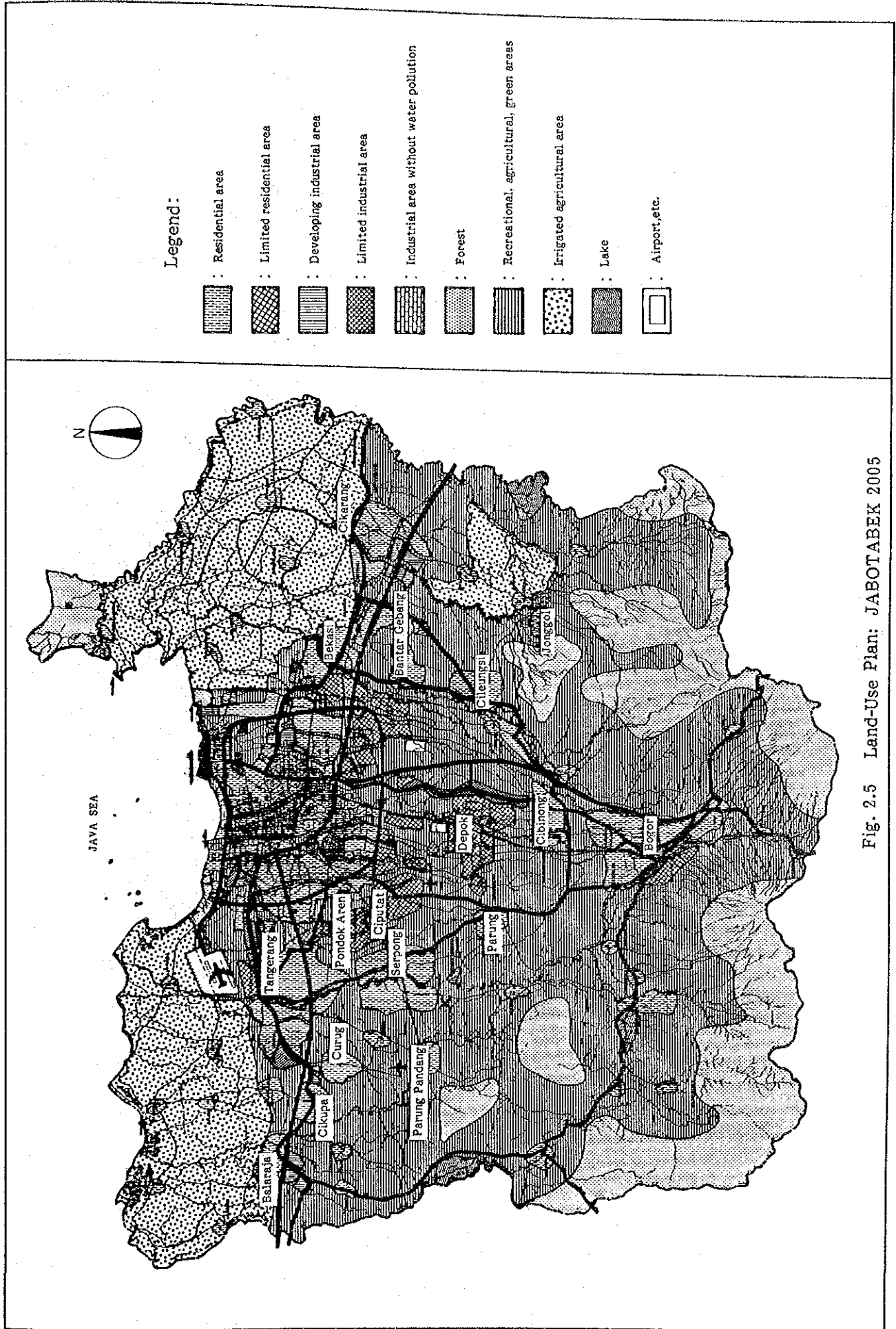


Fig. 2.5 Land-Use Plan: JABOTABEK 2005

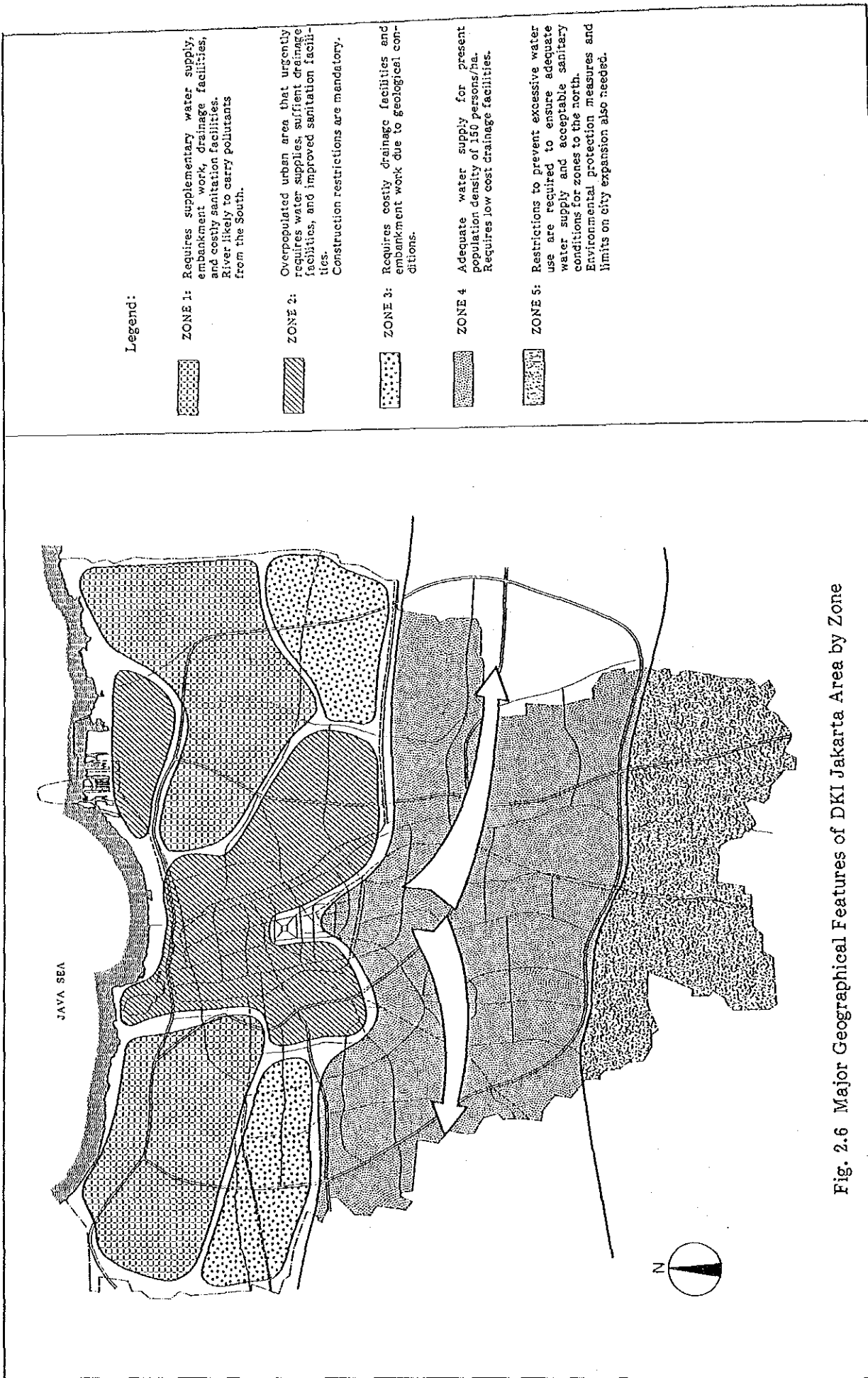
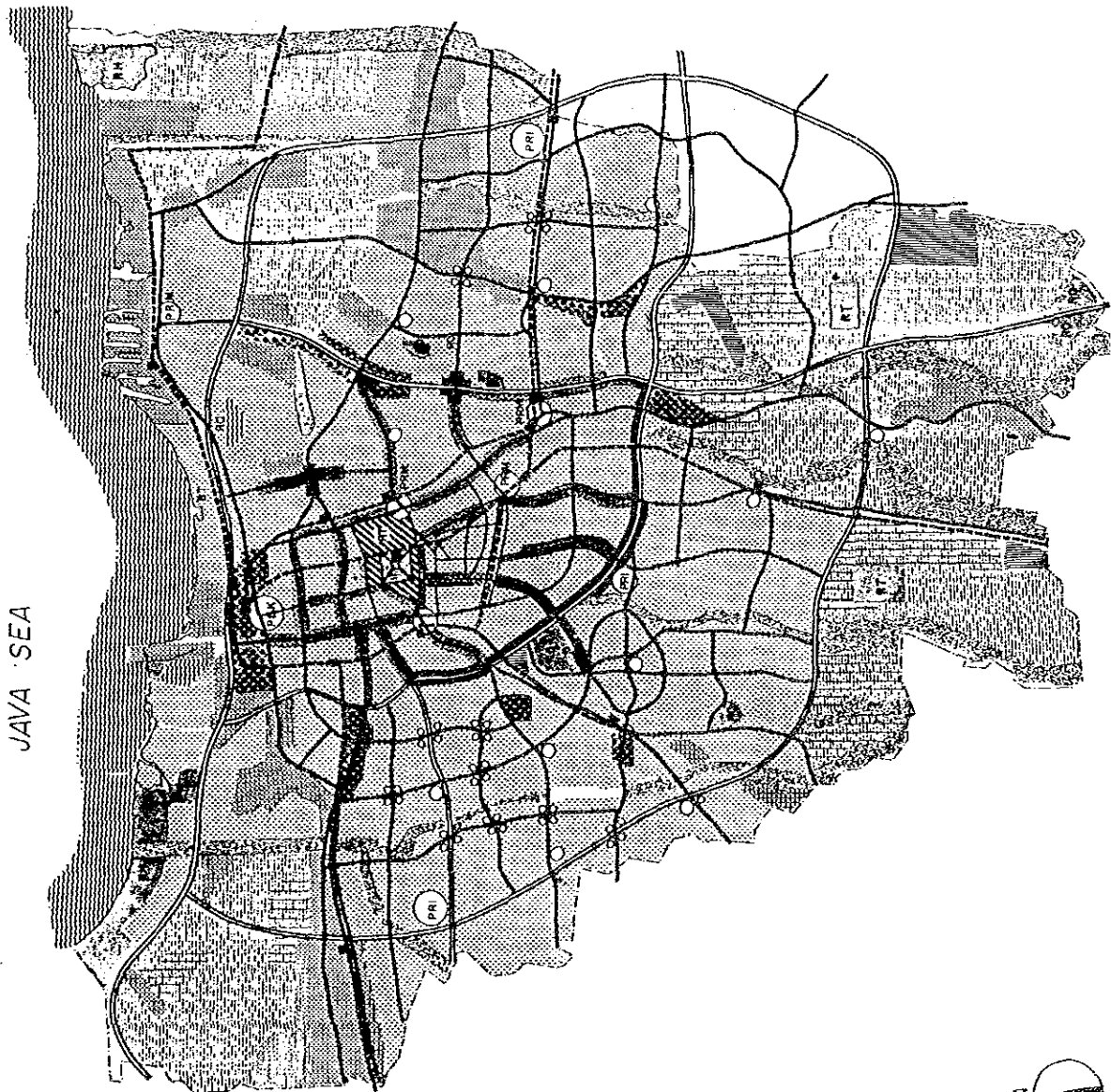


Fig. 2.6 Major Geographical Features of DKI Jakarta Area by Zone

JAVA SEA



Legend :

- COMMERCIAL AND BUSINESS AREA
- COMMERCIAL AND BUSINESS AREA WITH LOW DENSITY
- INDUSTRIAL AND COMMERCIAL MIXED AREA
- RESIDENTIAL AREA
- PUBLIC FACILITY AREA
- SPECIAL GOVERNMENT AREA
- INDUSTRIAL AREA
- AGRICULTURAL AREA WITH LOW DENSITY HOUSING
- AGRICULTURAL AREA
- RECREATIONAL AREA
- RESERVED AREA FOR FLOOD PREVENTION
- EASTERN AND WESTERN REGION COMMERCIAL CENTER
- DISTRICT COMMERCIAL CENTER
- NEIGHBOURHOOD COMMERCIAL CENTER
- PRI PRIORITY FOR EXPANSION
- PBK LIMITED EXPANSION WITH IMPROVEMENT
- PRM LIMITED EXPANSION WITH RENEWAL
- RT RECREATION/GARDEN
- RO RECREATION/SPORT
- RM RECREATION/RESERVED FOREST
- ⊗ DEVELOPING CENTER AT ROAD INTERSECTION AREAS



Fig. 2.7 Land-Use Plan, DKI Jakarta 2005

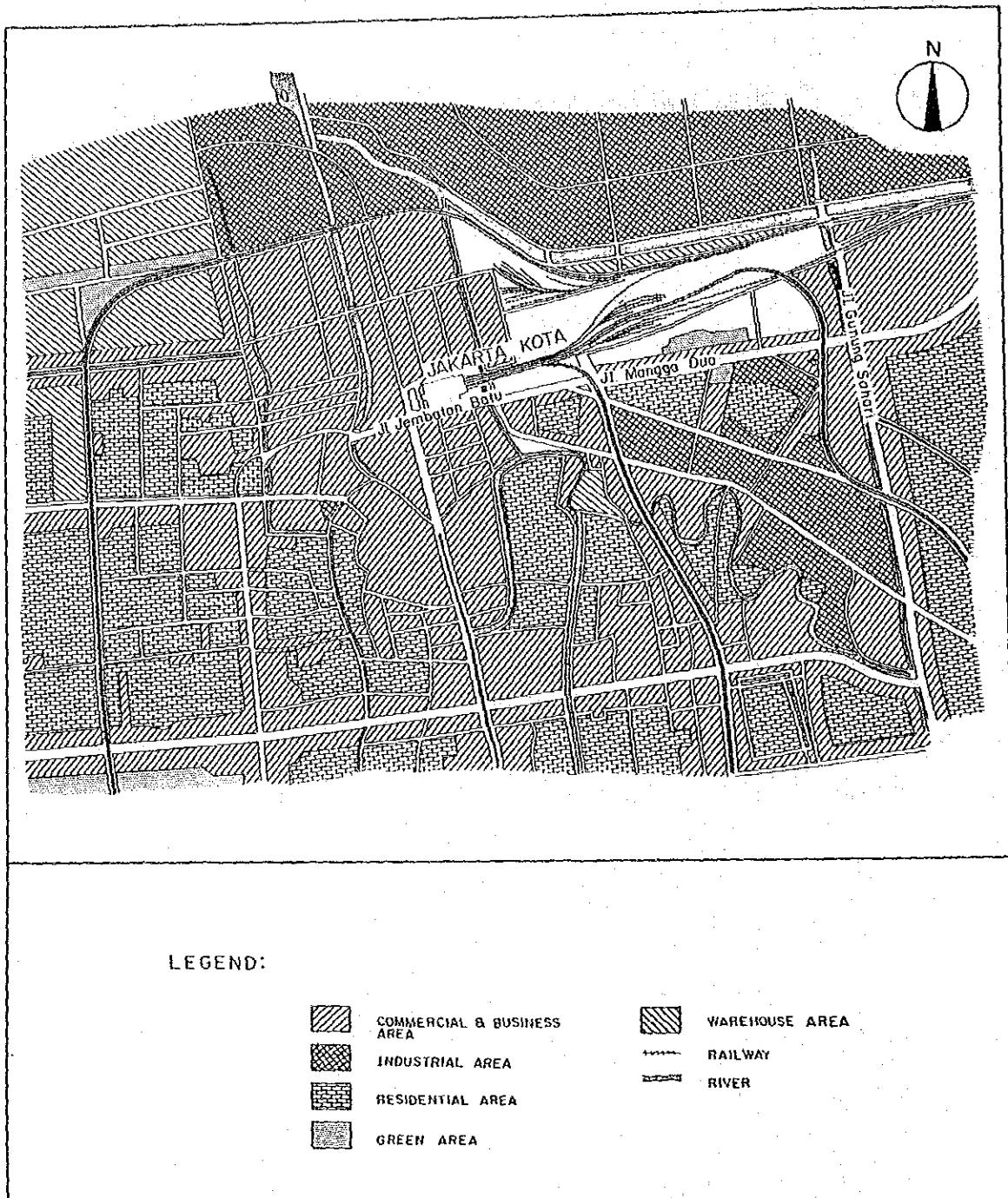


Fig. 2.8 Future Land-Use Plan around Jakarta Kota Station

2.4 Current State of Transportation

2.4.1 Current State of Railways

(1) Railway Network

Like other railway lines throughout Indonesia, the railway lines in the JABOTABEK Area were constructed before Independence. The total length of Area lines is approximately 158 km (excluding freight train routes), and all are equipped with 1,067 mm gauge. The Kampung Bandan Station Area is a key zone in the network.

Railway lines in the JABOTABEK Area are shown in Table 2.3 and Fig. 2.9.

Table 2.3 Railway Network in JABOTABEK Area

Line	Section	Distance (km)	Single or Double Track	Electrified or Not
Western Line	Jak-Kpb	1.4	Double	Electrification under way
	Kpb-Du-Thb-Mri	15.0		
	Mri-Jng	2.6		
Eastern Line	Jak-Pse-Jng	12.5	Double	Electrified
	Tpk-Rjw	6.7		
Central Line	Jak-Gmr-Mri	9.8	Double	Electrified
Bogor Line	Mri-Boo	44.9	Single	Electrified
Tg. Priok Line	Jak-Tpk	8.1	Double	Electrified
Tangerang Line	Du-Tng	19.3	Single	Not electrified
Merak Line	Thb-Srp	23.3	Single	Not electrified
Bekasi Line	Jng-Bks	14.8	Double	Not electrified
JABOTABEK Total		158.4		

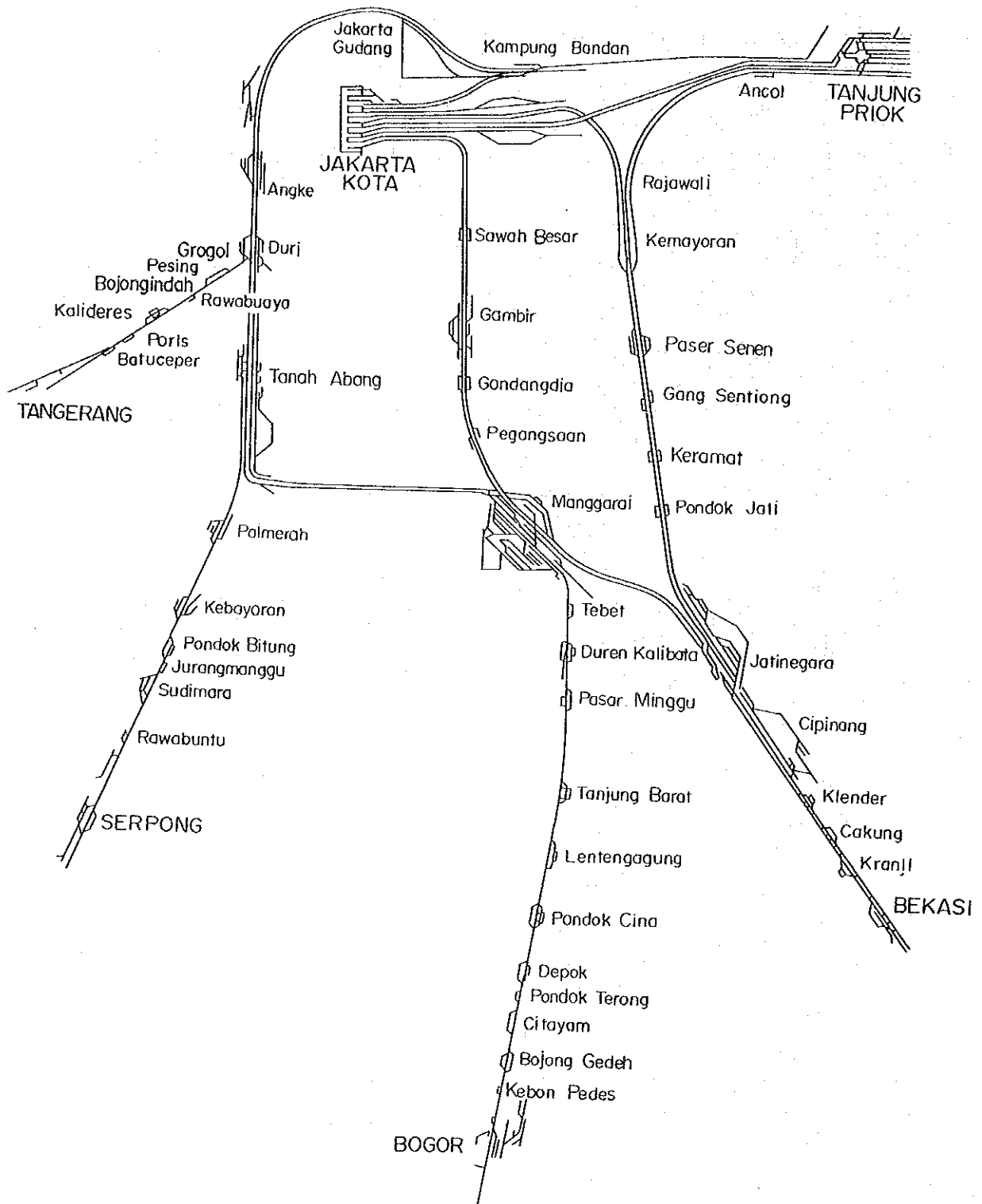


Fig. 2.9 Map of the JABOTABEK Area Railway Network

(2) Railway Traffic

Railway service plays an important part in the lives of citizens in the Kampung Bandan Station Area. Several surveys were conducted for the purpose of acquiring information about current railway traffic.

(a) Passenger Counting Survey at Jakarta Kota Station

A passenger counting survey was conducted at Jakarta Kota Station on Tuesday, 11 December 1984 (see Fig. 2.10).

This figure shows that passengers getting on and off at Jakarta Kota Station are concentrated in the morning peak hours (7 - 9 o'clock), making up as much as 40% of the whole daily passenger volume. This peak ratio appeared somewhat high, however, it was reconfirmed by a supplementary survey.

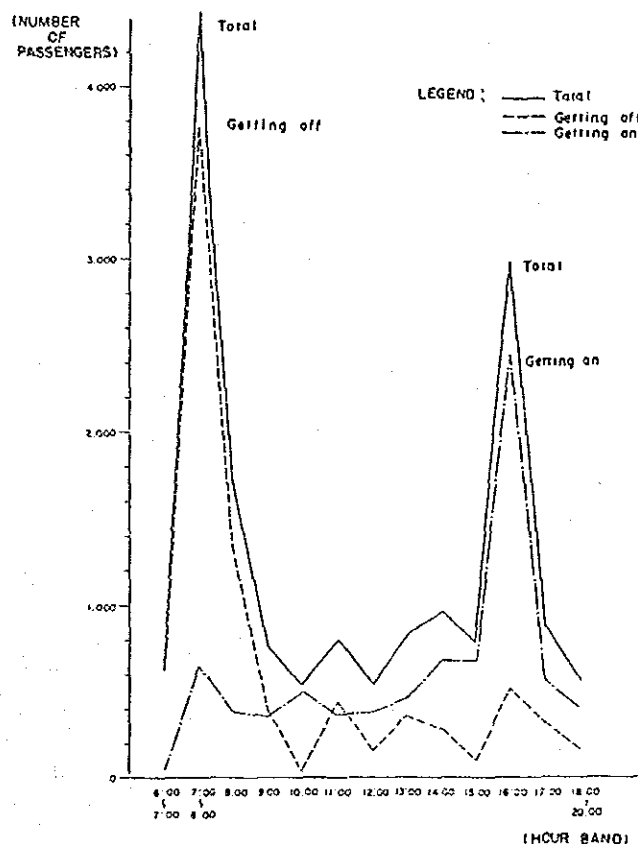


Fig. 2.10 Passenger Traffic Fluctuation at Jakarta Kota Station

(b) Interview Survey of Railway Passengers

An interview survey of railway passengers getting off at Jakarta Kota Station was done on Monday, 10 December 1984, as to how they reach their final destinations (see Fig. 2.11).

The survey indicated that about 40% of the railway passengers go from Jakarta Kota Station to their final destinations on foot, with 80% of them arriving there within 10 minutes; about 40% travel by bus or minibus, with 75% of this group riding between 5 and 30 minutes.

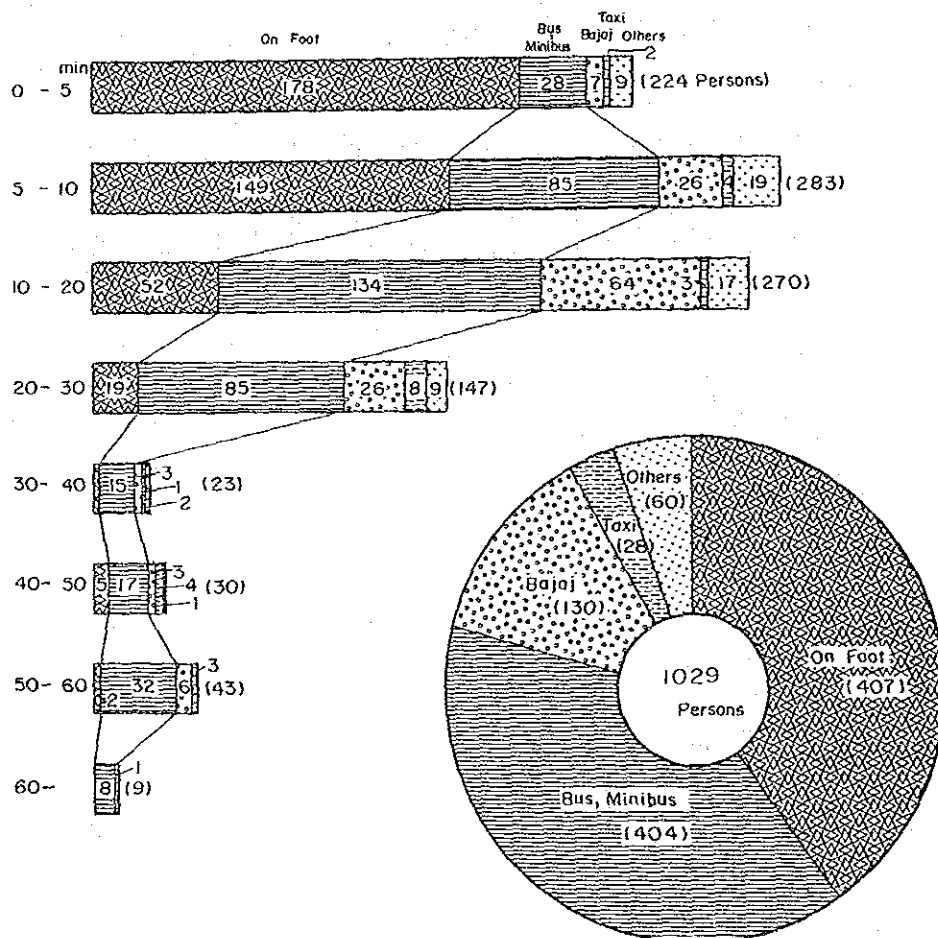


Fig. 2.11 Egress Time and Mode used from Jakarta Kota Station

(c) Interview Survey of Office Workers

Another interview survey of office workers around Jakarta Kota Station was conducted in December, 1984, as to their means of transportation and what they expect from railway service (see Fig. 2.12 and Table 2.4).

Figure 2.12 shows that the offices of these workers are located within 1 km of Jakarta Kota Station, resulting in a railway modal share that is comparatively higher than that of other DKI Jakarta areas. The proximity to Jakarta Kota Station may account for the higher portion of train commuters.

Table 2.4 indicates that most office workers hope for more frequent punctual, and comfortable train operation.

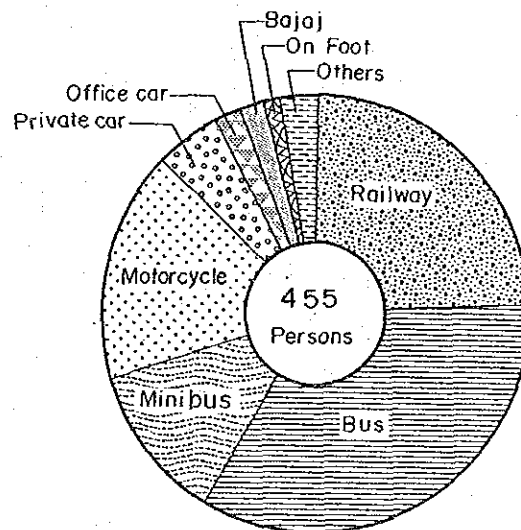


Fig. 2.12 Commutation by Mode

Table 2.4 Office Workers' Expectations of Railway

(Unit: persons)

Mode of commu- tation	More frequent service	Punctual service	More railcars	New stations (lines)	Others	Total
Railway commuter	34	42	46	11	11	144
Bus	51	34	28	20	15	148
Minibus	16	10	8	4	5	43
Others	31	33	17	20	19	120
Total (%)	132 (29)	119 (26)	99 (22)	55 (12)	50 (11)	455 (100)

2.4.2 Current State of Roads

Unlike railway transportation, road capacity is nearing its limit in DKI Jakarta.

(1) Road Network

The road network in DKI Jakarta had a total length of 2,990 km at the end of 1983. This is approximately three times that of the 1971 figure, but it has changed little since 1976. All major roads in DKI Jakarta are paved with asphalt and can be categorized as good. Incidentally, 40% of the roads in Indonesia are paved with asphalt, and 20% with gravel.

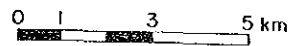
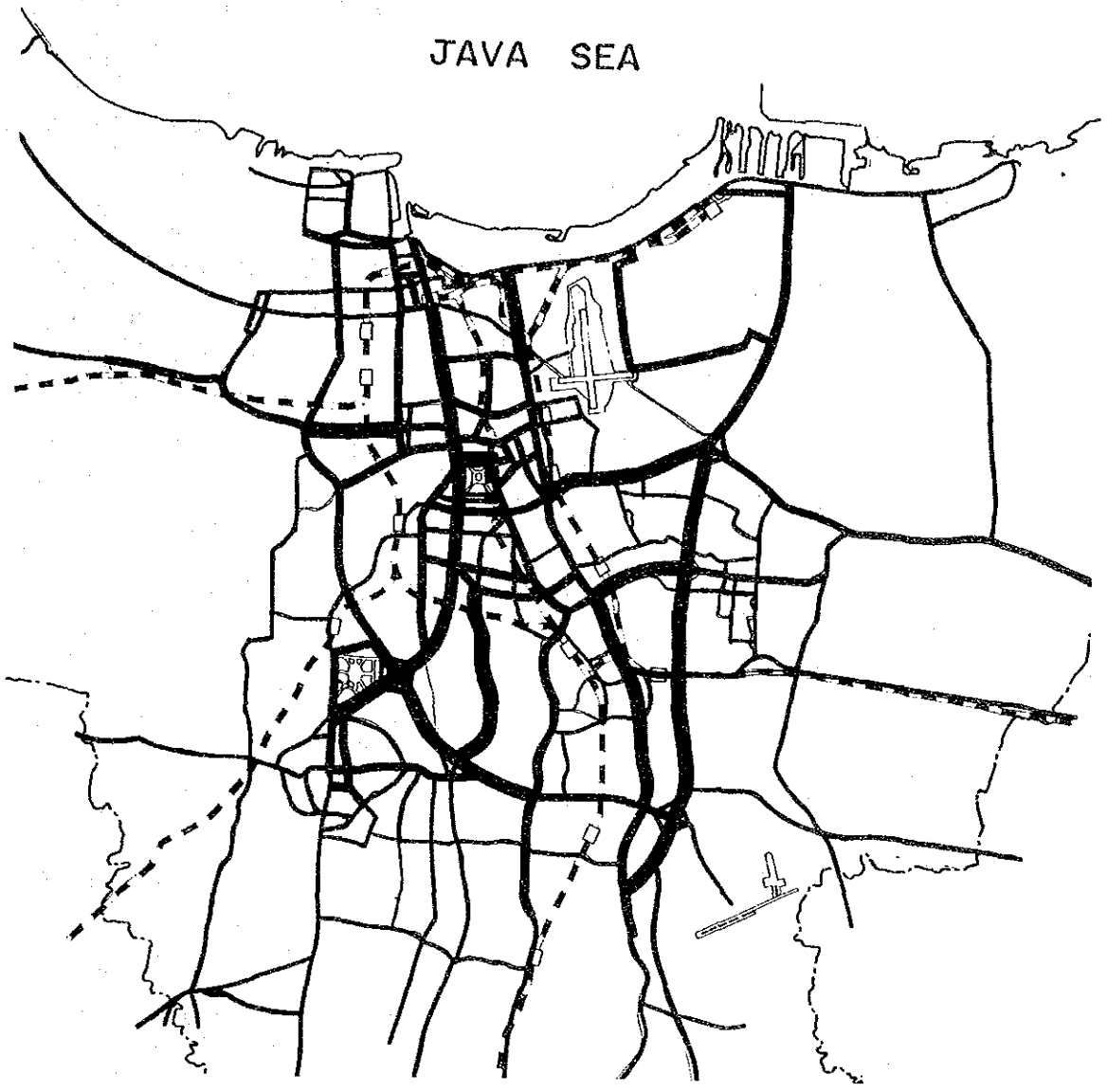
The existing road network conditions are shown in Table 2.5 and Fig. 2.13.

Table 2.5 Road Conditions (as of the end of 1983)

(Unit: km, (%))

Area	Total length	Type of surface			Condition		
		Asphalt	Gravel	Others	Good	Moderate	Poor
DKI Jakarta	2,990 (100)	2,990 (100)	- (-)	- (-)	2,990 (100)	- (-)	- (-)
West Java	13,023 (100)	8,967 (69)	1,901 (15)	2,155 (16)	4,510 (35)	4,137 (32)	4,376 (33)
Java	47,930 (100)	34,349 (72)	5,746 (12)	7,835 (16)	20,044 (42)	15,466 (32)	12,420 (26)
Indonesia	175,466 (100)	73,322 (42)	39,520 (23)	62,624 (35)	59,603 (34)	54,467 (31)	61,396 (35)

Source: Statistical Yearbook of Indonesia 1983



- Legend :
-  6 Lanes
 -  4 Lanes
 -  2 Lanes



Fig. 2.13 Road Network in DKI Jakarta

Despite the construction of new tollways, there is chronic road traffic congestion. The widening of existing arterial roads is under way, but this will not alleviate the road traffic problem caused by the enormous growth in the number of road vehicles (see Table 2.6 and Fig 2.14). The increase in buses and minibuses is especially remarkable. These facts indicate that more frequent use of the railway, a mass transportation mode, is required.

Table 2.6 Number of Road Vehicles by Type, DKI Jakarta 1974-1982

(Unit: 1000)

Year	Motor-cycle	Tricycle (Bajaj)	Sedan	Taxi	Minibus	Bus	Truck
1974	237	4	132	2	3	9	37
75	282	9	153	3	3	10	45
76	314	11	170	4	3	11	48
77	340	12	178	5	3	13	53
78	369	11	191	6	4	17	56
79	404	13	202	6	4	22	65
80	428	14	222	6	4	29	78
81	495	15	247	7	4	38	96
82	571	15	275	7	15	50	112

Note : Motorcycles, Sedans, Buses, and Trucks registered

Source: Statistical Yearbook of Jakarta 1983
Statistical Yearbook of Indonesia 1983

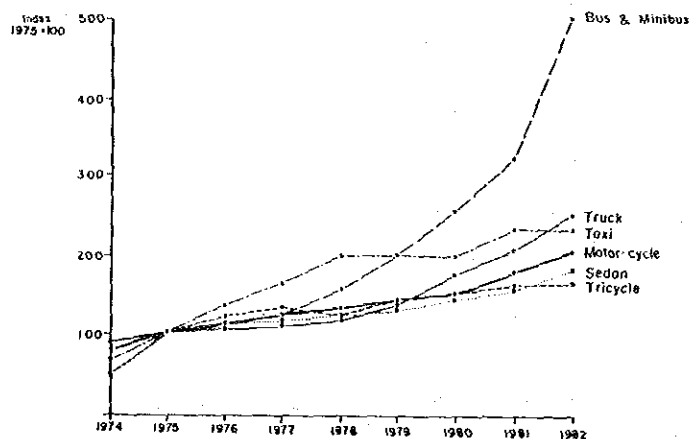


Fig. 2.14 Growth of Road Vehicles by Type, DKI Jakarta 1974-1982

(2) Road Traffic Condition

(a) Traffic Volume Survey

In order to measure the road traffic congestion in the Jakarta Kota Station and Kota Intan areas, vehicle traffic counting surveys were conducted on Thursday, 13 December 1984 (see Fig. 2.15).

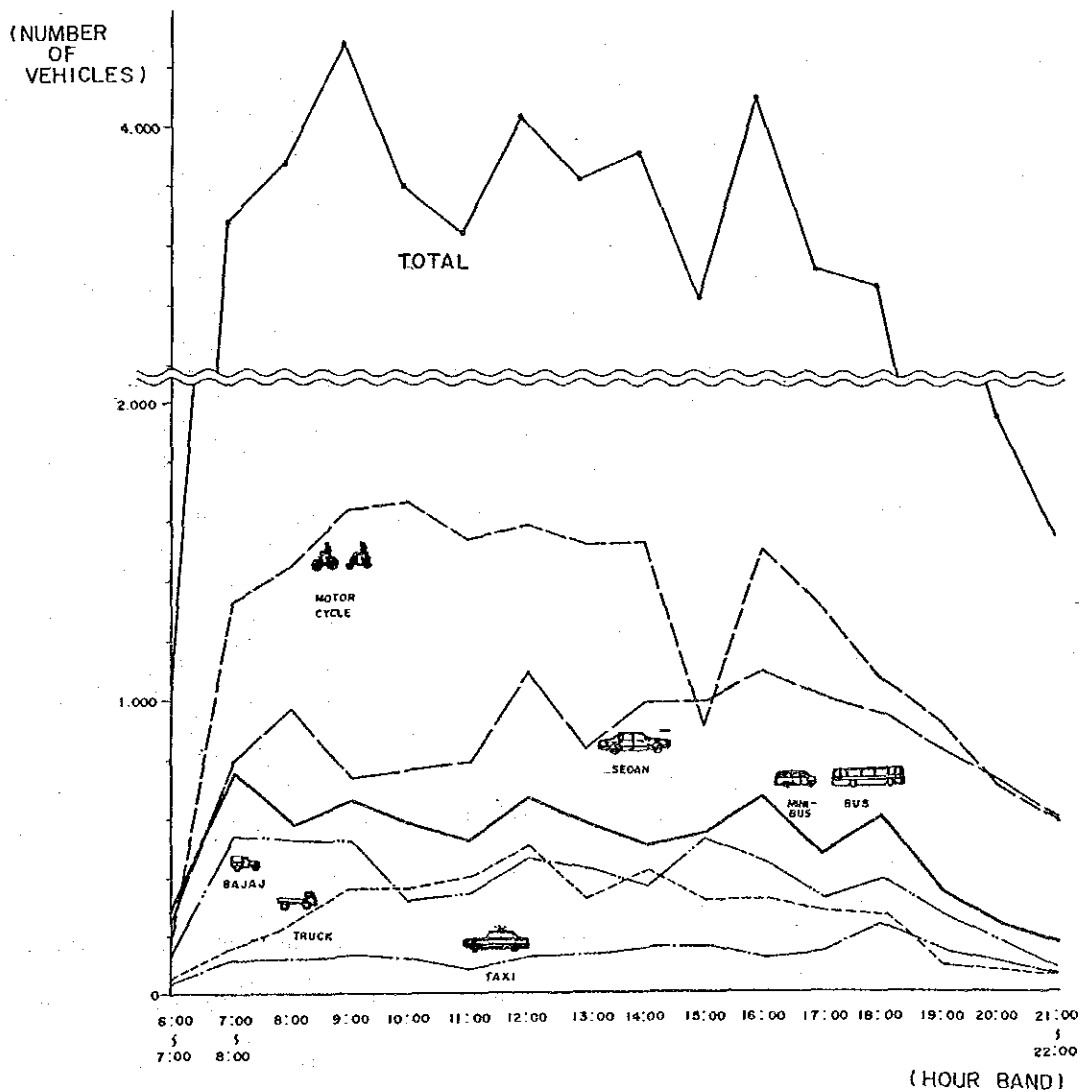


Fig. 2.15 Traffic Volume Fluctuations around Jakarta Kota Station

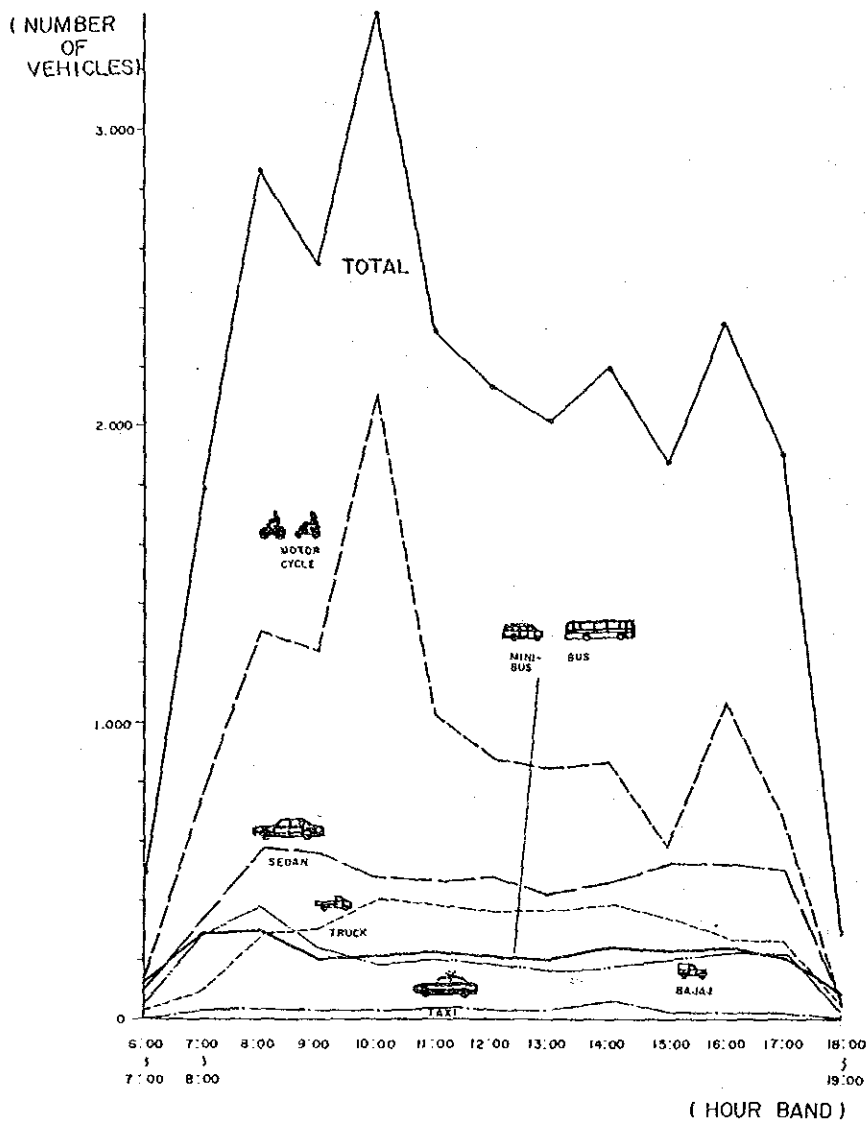


Fig. 2.16 Traffic Volume Fluctuations around Kota Intan Area

Figure 2.15 shows that there are three traffic peaks around Jakarta Kota Station per day: the morning, lunchtime, and evening peaks. Around the Kota Intan Area, the morning peak can be mostly attributed to the large number of motorcycles (see Fig. 2.16). However, if motorcycles are excluded, the same fluctuation can be seen here as around the Jakarta Kota Station.

(b) Average Bus Speed Survey

To acquire information on bus operating speeds for Kota (including stopping time at bus stops), another survey was taken on Monday, 11 February 1985. These figures indicate an overall average bus speed of less than 20 km/hour. The survey results are shown in Table 2.7.

Table 2.7 Average Speed of Buses in DKI Jakarta

Origin	Main route	Destination	Distance	Average Time	Average speed
Tg. Priok	Jl. Martadinata Jl. Gunung Sahari Jl. Pangeran Jayakarta	Kota	12 km	37 minutes	19.5 km/h
Grogol	Jl. K.H. Hasyim Asyari Jl. Gajah Mada	Kota	7.5	26	17.3
Blok M	Jl. Sudirman Jl. M.H. Thamrin Jl. Gajah Mada	Kota	14	45	18.6
Cililitan	Jl. M.J. Sutoyo Jl. L.J. Haryono Jl. H. Rangkyo Rosuna Said Jl. M.H. Thamrin Jl. Gajah Mada	Kota	20	55	21.8
Gambir	Jl. Medan Merdeka Utara Jl. Gajah Mada	Kota	5.5	17	19.4

CHAPTER 3 TRAFFIC DEMAND FORECAST

CONTENTS

	<u>Page</u>
3.1 Basic Concept	37
3.2 Preconditions	40
3.2.1 Zoning	40
3.2.2 Zonal Parameters	41
3.3 Traffic Demand Forecast	42
3.3.1 Future Person Trips Generated ... = Step - 1	42
3.3.2 Distribution of Mass Transit Person Trips = Step - 2	45
3.3.3 Modal Split between Railway and .. Bus = Step - 3	48
3.3.4 Future Railway Traffic Demand ... = Step - 4	52
3.3.5 Traffic Volume "Without Project" ..	58
3.3.6 Comparison of "With Project" and .. "Without Project"	60

CHAPTER 3 TRAFFIC DEMAND FORECAST

3.1 Basic Concept

The traffic demand forecast in this Study was conducted primarily to forecast the commuter traffic covering the whole JABOTABEK Area.

Prior to analysis, previous studies on metropolitan transportation, especially on JABOTABEK railway transportation, were reviewed and the traffic data (e.g. existing origin and destination tables, etc.) were re-examined. The results of a recent study conducted for the "Review of Feasibility Study on JABOTABEK Railway" (hereinafter referred to as the "Review of F/S") were also taken into account.

The traffic demand forecast follows the conventional four-step process. In this process, the future socio-economic development framework is first set up as a premise.

Step-1: Based on this framework, the number of future person trips to be generated is estimated for each zone.

Step-2: The interzonal distribution of person trips is forecasted.

Step-3: The modal split is performed and the future number of person trips by railway is obtained.

Step-4: Finally, the assigned traffic volume for each railway line is estimated.

The parameters for the forecast analysis are set up based on the existing statistical data.

Future traffic flow estimates rely heavily upon the results of the person trip analysis in the "Consulting Engineering Services for Jakarta Intra Urban

Tollway Part V - Phase I Report, (BINA MARGA) 1984" (hereinafter referred to as "JIUT"), which was made in preparation for a project of the Jakarta Intra Urban Tollway System.

The results from JIUT are considered up-to-date when compared with other previous analyses of person trips.

The process flow chart for the traffic demand forecast is shown in Fig. 3.1.

Readers are recommended to refer to the following chart in the subsequent sections of 3.2.1 to 3.3.4.

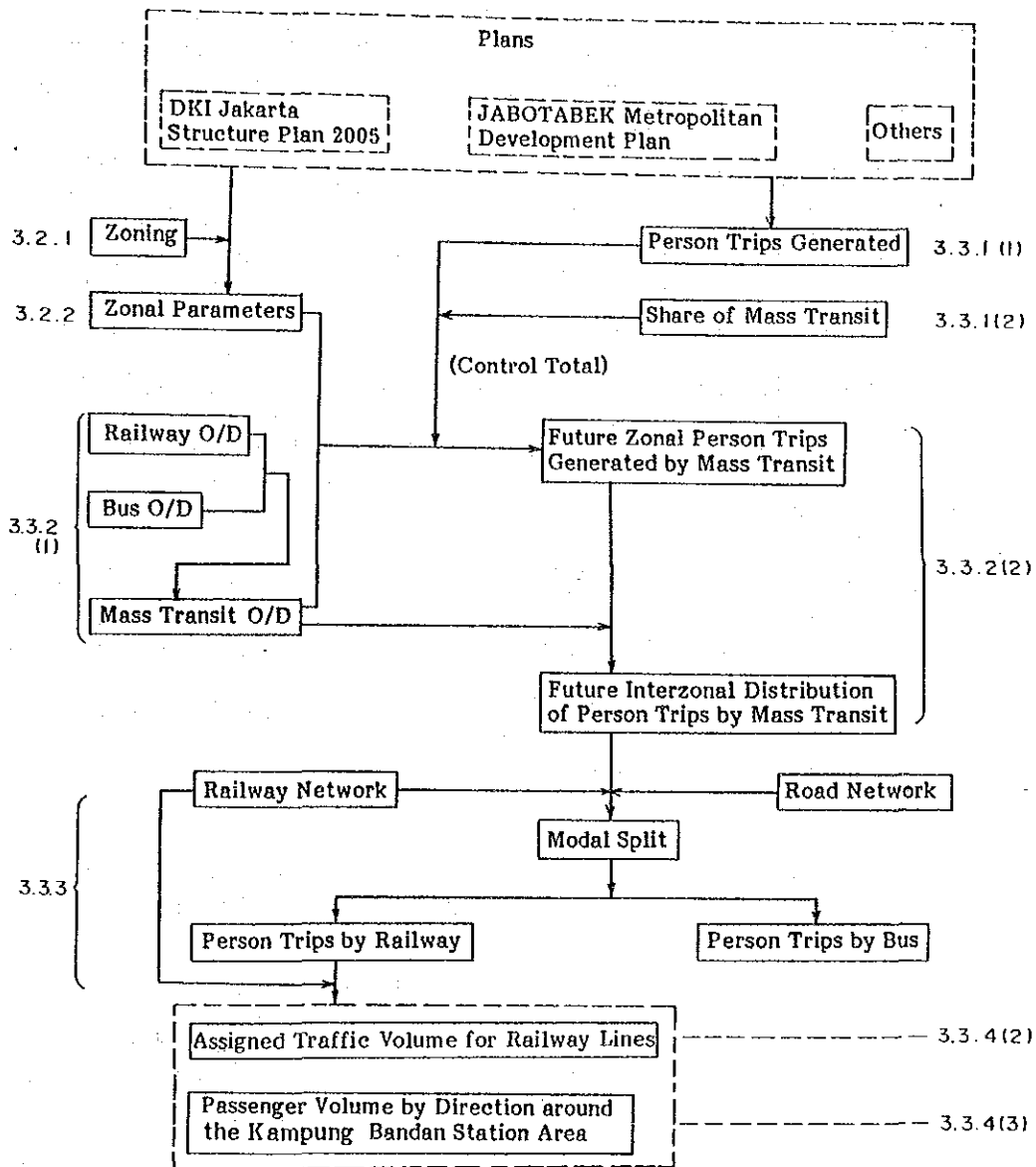


Fig. 3.1 Process Flow Chart for Traffic Demand Forecast

Note: The numbers beside the boxes indicate the labeling of subsequent sections. For example, to locate the section concerning zoning, you would look for the number 3.2.1.