



THE REPUBLIC OF
INDONESIA
THE STUDY ON INTEGRATED TRANSPORTATION
SYSTEM IMPROVEMENT BY RAILWAY AND
FEEDER SERVICE IN JABOTABEK AREA

FINAL
REPORT
VOLUME I
MASTER PLAN

THE REPUBLIC OF INDONESIA

THE STUDY
ON
INTEGRATED TRANSPORTATION SYSTEM IMPROVEMENT
BY RAILWAY AND FEEDER SERVICE
IN
JABOTABEK AREA

FINAL REPORT

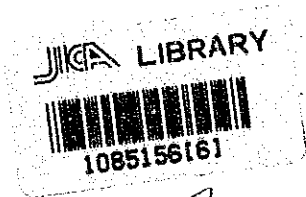
VOLUME I
MASTER PLAN

AUGUST 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

SSF
90-099

108
71
SSF
90-099



21557

THE REPUBLIC OF INDONESIA

THE STUDY
ON
INTEGRATED TRANSPORTATION SYSTEM IMPROVEMENT
BY RAILWAY AND FEEDER SERVICE
IN
JABOTABEK AREA

FINAL REPORT

VOLUME I
MASTER PLAN

AUGUST 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

国際協力事業団

21557

PREFACE

In response to a request from the Government of the Republic of Indonesia, the Japanese Government decided to conduct a study on the Integrated Transportation System Improvement by Railway and Feeder Service in Jabotabek Area and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Indonesia a study team headed by Misao Sugawara, Japan Railway Technical Service (JARTS), composed of members from the Pacific Consultants International (PCI) four times, from November 1988 to March 1989, from September to November 1989, from January to February 1990 and June 1990.

The team held discussions with concerned officials of the Government of Indonesia, and conducted field surveys. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

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

August, 1990



Kensuke Yanagiya

President

Japan International Cooperation Agency

August 1990

Mr. Kensuke YANAGIYA
President
Japan International Cooperation Agency
Tokyo, Japan

Dear Sir,

LETTER OF TRANSMITTAL

We have the pleasure of submitting herewith the final report of the Study on Integrated Transportation System Improvement by Railway and Feeder Service in JABOTABEK Area in the Republic of Indonesia.

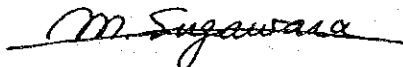
The Study was conducted from November 1988 to August 1990 by a team of experts from Japan Railway Technical Service and Pacific Consultants International.

Based on the Scope of Work agreed upon in February 1988 by the Japan International Cooperation Agency and the Indonesian Government, the study team sought for appropriate measures for establishing an integrated transportation system in the JABOTABEK Area. The Study includes drawing up a master plan which would be fully harmonized with related development projects and related transportation projects in the area, as well as the feasibility studies conducted for urgent projects, with cooperation of the Indonesian counterparts.

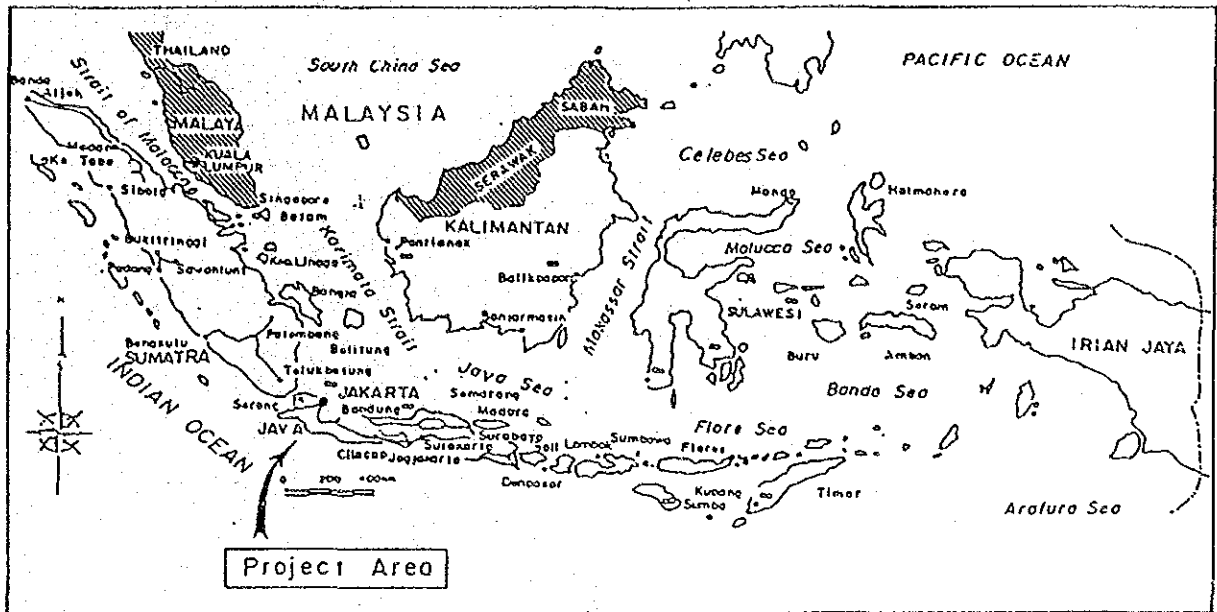
We hope that the Study will greatly contribute to the implementation of this project and to the transportation system improvement in the JABOTABEK Area.

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.

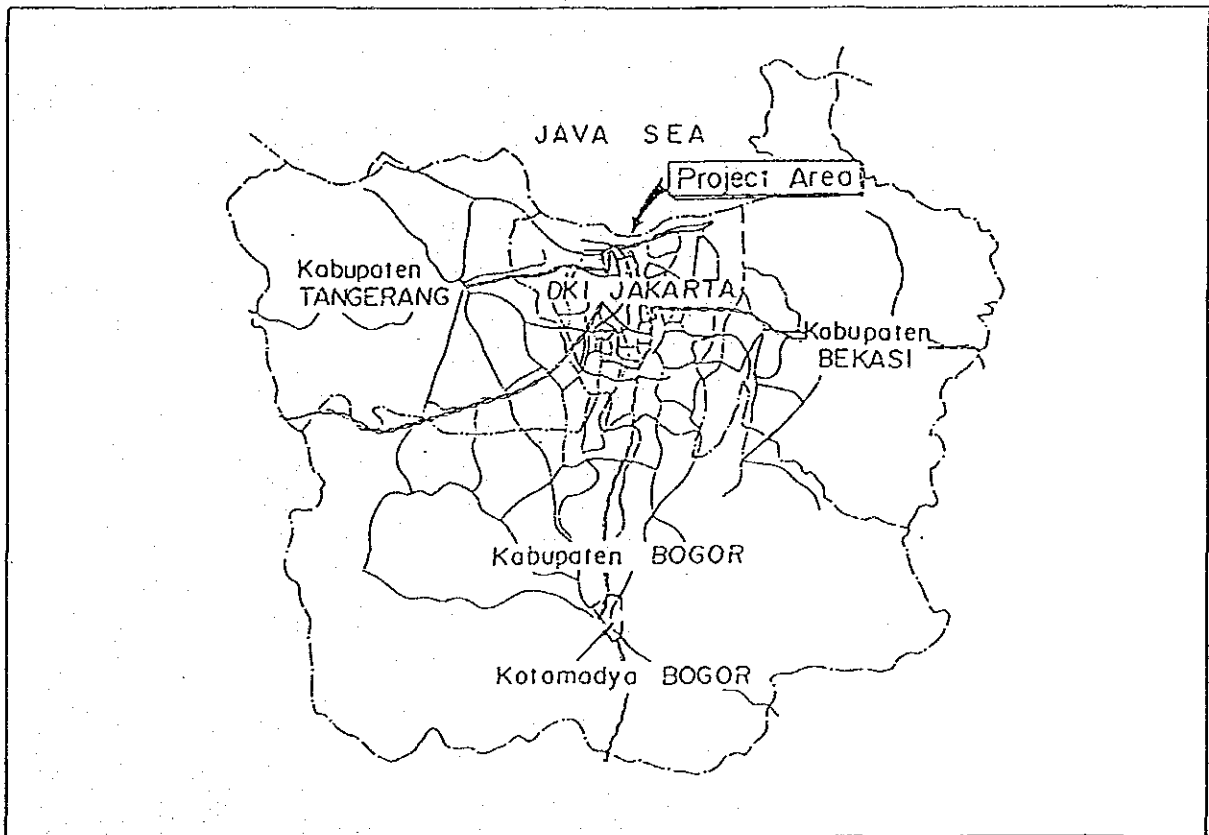
Very truly yours,



Misao Sugawara, Dr. Eng.
Study Team Leader
Integrated Transportation System
Improvement by Railway and Feeder
Service in JABOTABEK Area,
Indonesia



INDONESIA



JABOTABEK

CONTENTS

CHAPTER 1 Introduction

1-1	Background of the Study	1-1
1-2	Objective of the Master Plan Study	1-2
1-3	Basic Principle of the Study	1-3
1-4	Organization of the Study	1-4
1-5	Preparation of the Final Report	1-8

CHAPTER 2 Present Socio-economic Conditions and Future Development Perspective of Jabotabek

2-1	Overview of Present and Future Jabotabek	2-1
2-1-1	Present Contexts of Jabotabek	2-1
2-1-2	Future Development Strategies and Perspective	2-2
2-2	Present Socio-economic Conditions	2-3
2-2-1	Populaton	2-3
(1)	National and regional situations	2-3
(2)	Trends and distribution in Jabotabek	2-4
2-2-2	Employment Situation	2-6
2-2-3	Economic Basis	2-8
(1)	Economic growth	2-8
(2)	Economic structure in GDP/GRDP	2-9
2-2-4	Income	2-10
2-3	Review of Current Regional and Urban Development Policies and Strategis	2-11
2-3-1	Current National Development Plan	2-11
(1)	National developemnt objective and policy	2-11
(2)	Regional development policies and strategies for Jabotabek	2-12

2-3-2	Regional/Urban Development Plans within Jabotabek	2-12
	(1) Planning system for Jabotabek	2-12
	(2) Long-range development strategies for spatial planning .	2-14
	(3) Current regional development frame for 2005	2-16
	(4) Current sub-region development strategies and local- level implementation for 2005	2-18
2-3-3	Urban Pattern and Railway Corridor	2-25

CHAPTER 3 Present Situation of Transportation System

3-1	General Aspect of Transportation Systems	3-1
3-1-1	Introduction	3-1
3-1-2	Transportation Systems	3-1
	(1) JABOTABEK railway	3-1
	(2) Highway system	3-5
	(3) Other modes of transportation	3-8
3-1-3	Transit Ridership and Modal Share	3-14
	(1) Spatial distribution of transit patronage	3-14
	(2) Modal shares	3-18
3-1-4	Transportation Policies in JABOTABEK Area	3-22
	(1) DKI, Master plan	3-22
	(2) REPELITA V	3-23
3-2	Railway	3-24
3-2-1	Train Operation	3-24
	(1) Train operation routes	3-24
	1) JABOTABEK trains	3-24
	2) Medium and long distance passenger trains	3-25
	3) Freight trans	3-25
	(2) Train operations	3-29
	1) Number of trains	3-29
	2) Operation heads	3-29
	3) Arrival times and schedule speeds	3-30
	(3) Car depots and storage tracks	3-32
	1) Number of cars, according to type	3-32
	2) Storage tracks	3-33

3)	Actual use of electric and diesel cars	3-34
(4)	Operating personnel	3-35
1)	Power car crew	3-35
2)	Car maintenance personnel	3-35
3)	Station personnel	3-35
4)	Conductors	3-37
(5)	Power consumptions of electric and diesel cars	3-37
(6)	Train dispatch	3-37
(7)	Problems in train operation	3-37
1)	Too many operating accidents	3-37
2)	Greater train delay	3-38
3)	Lower scheduled speed of JABOTABEK trains	3-38
4)	Train dispatch not functioning satisfactorily	3-38
3-2-2	Facilities	3-41
(1)	Stations	3-41
1)	General	3-41
2)	Station track layout	3-41
3)	Platform	3-42
4)	Connecting passages	3-43
5)	Main station building and station plaza	3-44
(2)	Track and structure	3-50
1)	Present conditions of tracks	3-50
2)	Crossing facilities	3-50
3)	Maintenance depot	3-50
4)	Security equipment	3-51
5)	Miscellaneous (safety equipment, protective fence and real property)	3-52
(3)	Signalling and telecommunications	3-52
1)	Signalling	3-52
2)	Telecommunications	3-56
(4)	Electricity	3-61
1)	Equipment	3-61
2)	Maintenance	3-61
(5)	Rolling stock	3-65
1)	Outline of rolling stock	3-65
2)	Car maintenance	3-65
3-2-3	Management	3-66

(1)	Management form	3-66
(2)	Organization of PJKA	3-66
1)	Head office	3-66
2)	Regional offices	3-67
3)	Sub regional offices	3-71
(3)	Financial state	3-71
1)	Principles of operation	3-71
2)	Financial state of PJKA as a whole	3-72
3)	Financial state in the JABOTABEK Area	3-73
(4)	Characteristics of Railway Enterprises	3-79
(5)	Problems with Commercial Service in PJKA as Compared with Japanese Railway Enterprises	3-81
3-3	Road Based Transportation Systems	3-91
3-3-1	Bus System	3-91
(1)	Type of buses and service characteristics	3-91
(2)	Bus routes and service area	3-95
(3)	Bus related facilities	3-97
(4)	Institutional aspects	3-98
(5)	Summary of problems of bus operation	3-100
3-3-2	Projects and Plans for System Improvements	3-108
(1)	Introduction	3-108
(2)	Road network development	3-109
(3)	Bus service improvements	3-111
(4)	Traffic management schemes	3-119
3-4	Transportation Interchange and Railway Feeder Systems	3-124
3-4-1	Inter-Modal Dependency and User Behaviour	3-124
(1)	Access modes to railway	3-124
(2)	Bus-rail interchange behaviour	3-125
(3)	User attitudes to bus and rail service	3-131
3-4-2	Insufficient Condition of Feeder Facilities	3-135
(1)	Approach roads to railway stations	3-135
(2)	Inter-modal transportation facilities	3-138
(3)	Station front plaza	3-140

CHAPTER 4. Approach to Formulating a Master Plan

4-1	Basic Standpoint	
	Role of Railway in JABOTABEK Area	4-1
4-1-1	Urban Transportation Problem	4-1
4-1-2	Role of Railways (Guided Transportation System) in Urban Transportation	4-2
	(1) Transportation capacity.....	4-2
	(2) Construction and operating expenses.....	4-2
	(3) National economic evaluation.....	4-6
	(4) Financial resources.....	4-10
4-1-3	Resolution of Urban Transportation Problems in the JABOTABEK Area	4-13
4-2	Basic Methodology	4-15
4-3	Outline of Alternative Patterns	4-18
4-4	Feeder Service	4-23
4-4-1	Integration of Public Transportation Network	4-23
4-4-2	Provision of Feeder Service to Railway Station	4-24
	(1) Selection of feeder mode.....	4-24
	(2) Type of buses along side of railway line.....	4-25
4-4-3	Reduction of Transfer Resistance Factors	4-28
4-4-4	Basic Approach of Feeder Service	4-30

CHAPTER 5 Details of Alternative Patterns

5-1	Introduction	5-1
5-2	Projects to be Accomplished by 1992 (options "a" and "b")	5-1
5-2-1	Transportation Plan	5-2
	(1) Option "a" transportation plan	5-2
	1) Train operation routes.....	5-2
	2) Restrictions in facilities.....	5-4
	3) Demand forecasts and transportation capacity.....	5-6
	4) Comparison of the service levels of options "a" and "b"	5-7
	(2) Option "b" transportation plan.....	5-9

1) Train operation routes	5-9
2) Restrictions in facilities	5-9
3) Demand forecast and transportation capacity.....	5-13
4) Service level of option "b"	5-13
5-2-2 Feeder Service	5-14
5-2-3 Facility Plan	5-15
(1) Option "a"	5-15
(2) Option "b"	5-18
5-2-4 Selection of a, b Option	5-19
(1) Economic Analysis of Option "b".....	5-19
1) Objective	5-19
2) Evaluation criteria	5-19
3) Preconditions of the analysis	5-20
4) Economic cost of option "b"	5-20
5) Economic benefits	5-26
6) Result of the analysis	5-32
(2) Financial analysis of option "b".....	5-34
1) Purpose and method of analysis	5-34
2) Assumptions	5-34
3) Amount of investment	5-35
4) Business income	5-35
5) Business expenditure	5-36
6) Results os analysis	5-36
7) Sensitivity analysis	5-36
(3) Result	5-41
5-3 Alternative patterns for Railway Case, (Ry1, Ry2, Ry3).....	5-42
5-3-1 Transportation plan	5-42
(1) Transportastion plan of alternative Ry1	5-42
1) Train operation routes	5-42
2) Restrictions in facilities	5-42
3) Forecasted demand and transportation capacity	5-44
4) Service level	5-46
(2) Ry2 case	5-47
1) Train operation routes	5-47
2) Restrictions in facilities	5-47
3) Demand forecast results and transportation capacity..	5-50
4) Service level	5-51

(3) Ry3 case	5-51
1) Train operation routes	5-51
2) Facility improvement	5-51
3) Demand forecast results and transportation capacity..	5-53
4) Service level	5-53
5) Scheduled speeds	5-53
6) Number of electric and diesel cars	5-53
7) Operation of middle- and long-distance trains.....	5-56
8) Coal transportation	5-59
5-3-2 Feeder Service	5-62
(1) Area service	5-62
1) Railway station and proximate bus terminal	5-62
2) Shuttle service between the railway station and the intercity bus terminal	5-63
3) Direct feeder service between the railway station and the area served by the station.....	5-63
(2) Program for the improvement of intermodal facilities....	5-63
1) improvement of traffic flow	5-63
2) Provision of traffic safety facilities.....	5-63
5-4 Alternative Patterns for Road Case, (BC-00, BC-01, BC-02).....	5-65
5-4-1 Base Case for Year 1992 (BC-00)	5-65
5-4-2 Base Case for Year 2005 (BC-01)	5-65
5-4-3 Base Case for Year 2005 (BC-02)	5-66
5-4-4 Mass Transit Corridor Network	5-67
(1) North-South Route	5-67
(2) West-East Route	5-67
5-4-5 Selection of Appropriate MRT System for Main Corridors....	5-70
(1) Introduction	5-70
(2) Procedures for selection of the system.....	5-70
(3) Selection of the system.....	5-70
1) Demand forecast.....	5-70
2) Types of the systems examined and maximum transportation capacity of each system.....	5-74
3) Examination of the need of interpenetrating operation with existing railway.....	5-74
4) Establishment of running level (ground level, elevated or underground).....	5-76

5)	Economic assessment.....	5-76
6)	Social and other assessments	5-83
7)	Comparison of the system characteristics.....	5-83
8)	Conclusion.....	5-83
5-5	Cost Estimation.....	5-87

CHAPTER 6 Transportation Demand Forecast

6-1	General.....	6-1
6-1-1	Objective.....	6-1
6-1-2	General Procedure.....	6-1
6-2	Model Development.....	6-2
6-2-1	Preconditions.....	6-2
(1)	Trips analyzed and forecasted.....	6-2
(2)	Data base.....	6-2
(3)	Modes.....	6-3
(4)	Trip purpose.....	6-3
(5)	Peak period demand.....	6-3
(6)	Traffic zones.....	6-3
(7)	Trips by private and public modes.....	6-3
6-2-2	Forecasting Systems.....	6-7
(1)	General.....	6-7
(2)	Trip table update and model validation.....	6-8
1)	Supplementary surveys.....	6-8
2)	Network development.....	6-11
3)	Methodology.....	6-12
(3)	Models.....	6-17
1)	Trip generation/attraction model.....	6-17
2)	Trip distribution model.....	6-23
3)	Mode split model.....	6-23
6-3	Demand Forecast.....	6-27
6-3-1	Socio-economic Framework.....	6-27
(1)	Economic development.....	6-27
(2)	Population and employment.....	6-27
6-3-2	Future Transportation Network and Preconditions.....	6-32

(1)	Forecast cases.....	6-32
(2)	Future transportation networks.....	6-32
1)	Railway network.....	6-32
2)	Road network.....	6-33
3)	Bus network.....	6-34
(3)	Other Preconditions.....	6-34
1)	Future time value.....	6-34
2)	Future fare level.....	6-35
3)	Average occupancy of road vehicles.....	6-35
4)	Private car restraint policies.....	6-35
6-3-3	Future Trip Production.....	6-36
(1)	Studies on person trips.....	6-36
(2)	Future trip production.....	6-36
6-3-4	Results of Forecast.....	6-39
(1)	General.....	6-39
(2)	Trips between aggregated zones.....	6-39
(3)	Railway link traffic.....	6-44
(4)	Bus passengers and road traffic.....	6-44
(5)	Railway freight transportation demand.....	6-44

CHAPTER 7 Selection of Optimal Pattern

7-1	Economic Evaluation	7-1
7-1-1	Methodology	7-1
(1)	Generalized cost approach	7-1
(2)	Basic idea for use of annualized generalized cost at 2005	7-2
(3)	Calculation of VT_1 and other benefits	7-2
(4)	Calculation of cost	7-3
(5)	Justification of adoption of annualized generalized cost approach for evaluation of alternative patterns	7-4
(6)	Evaluation criteria	7-5
7-1-2	Economic Costs	7-6
(1)	Railway investment cost.....	7-6
(2)	Road investment cost.....	7-6

	(3) Mass transit system investment costs.....	7-6
7-1-3	Economic Benefits	7-10
	(1) Maintenance & operation cost difference.....	7-10
	1) Railway.....	7-10
	2) Road.....	7-10
	3) Mass transit system.....	7-11
	4) Road vehicle.....	7-11
	(2) Time savings.....	7-12
	1) Travel time decrease.....	7-12
	2) Freight transportation time decrease.....	7-12
	3) Time savings at major railway crossings.....	7-12
	(3) Utilization of Land.....	7-13
7-1-4	Result of Generalized Cost Analysis	7-13
7-2	Selection of optimal pattern	7-17

CHAPTER 8 Drawing-up of Master Plan

8-1	Concepts of the Master Plan	8-1
8-2	Outline of the Selected Pattern	8-3
	(1) Double tracking, electrification and automatic signalling on C/L (Dp-Boo)	8-4
	(2) Relocation of Kota station	8-4
	(3) Track elevation of E/L (Kota-Gangsentiong).....	8-5
	(4) Flyover on W/L.....	8-10
	(5) Improvement of passenger handling facilities.....	8-10
	(6) Construction of new stations.....	8-13
	(7) Improvement of feeder services.....	8-13
	(8) Electrification on Tangerang Line.....	8-19
	(9) Double tracking of Serpong Line.....	8-19
8-3	Implementation Schedule of Master Plan and Selection of Urgent Project for F/S	8-20
	(1) Feeder service improvement Station facility improvement	8-21
	(2) Track Elevation of Eastern Line Flyover construction on Western Line	8-21

(3)	Construction of new stations	8-21
(4)	Relocation of Kota station Construction of a car depot incidental to new Kota station.....	8-22
(5)	Double tracking, electrification and automatic signalling on Central Line (Dp-Boo) Electrification of Tangerang Line Double tracking, electrification and automatic signalling on Serpong Line.....	8-22
(6)	Mass transit corridor	8-22
8-4	Outline of F/S Projects.....	8-26
8-4-1	Improvement of Feeder Services.....	8-26
(1)	Urgency of the improvement.....	8-26
1)	Present condition of the feeder facilities.....	8-26
2)	Demand forecast.....	8-27
3)	Urgency and establishment of the order of priority for improvement	8-27
(2)	Policy for improvement.....	8-30
1)	Components of feeder facilities.....	8-30
2)	Feeder improvement projects which reflect the railway transportation plan and local needs.....	8-31
3)	Selection of projects taken up in F/S.....	8-31
8-4-2	Improvement of Station Facilities.....	8-31
(1)	Urgency of improvement.....	8-31
1)	Present condition of station facilities.....	8-31
2)	Demand forecast.....	8-32
3)	Judgement of urgency and establishment of priorities for improvement.....	8-32
(2)	Principle of improvement.....	8-32
1)	Station building.....	8-33
2)	Platform.....	8-33
3)	Overbridge.....	8-34
4)	Platform shed.....	8-34
8-4-3	Track Elevation of Eastern Line	8-34
(1)	Present condition.....	8-34
(2)	Necessity of grade separation	8-35
(3)	Urgency of grade separation.....	8-35

(4) Scope of work to be taken up in the F/S.....	8-36
--	------

APPENDIX

Appendix 1-1 Minutes of Meeting on the Inception Report	A-1
Appendix 1-2 Minutes of Meeting on Improvement Cases Proposal	A-6
Appendix 1-3 Minutes of Meeting on the Interim Report I	A-11
Appendix 4-1 Scale of Station Plaza Calculated from the Number of Passengers	A-13
Appendix 4-2 Improvement of Feeder Services	A-14
Appendix 8-1 Cost Sharing of the Railway Facilities Related to Urban Facilities (in the Case of Japan)	A-20

List of Tables

Table	
2.2.1.1	Population by Province/Region (1961-85).....2-4
2.2.1.2	Population projection by Region for 1985-1990 (BPS).....2-4
2.2.1.3	Population in JABOTABEK (1961/71/80/85).....2-5
2.2.2.1	Labor Force Supply & Employment.....2-6
2.2.2.2	Industrial Composition of Employment (1971-1985).....2-7
2.2.3.1	Trends of GRDP Growth Rate & Per Capita in Indonesia & JABOTABEK (1971-1984)2-8
2.2.3.2	GRDP & Per Capita GRDP by Region (1979-1985).....2-9
2.2.4.1	Population Distribution by Expenditure Level in DKI Jakarta, 1984.....2-10
2.3.2.1	Future Regional Frame of Population in JABOTABEK.....2-18
2.3.2.2	Urban Population Distribution and Settlement Hierarchy in BOTABEK.....2-23
3.1.2.1	Road Length by Type in DKI, Jakarta, 1982.....3-5
3.1.2.2	Number of Fixed Route Bus Fleets Licensed in DKI Jakarta, 1977-1989.....3-11
3.1.2.3	Characteristics of Other Public Transportation in Jakarta, 1988..3-12
3.1.2.4	Number of Other Public Transportation Fleets in DKI Jakarta 1977-1989.....3-13
3.1.3.1	Railway Stations with More Than 5,000 Passengers/Day.....3-14
3.1.3.2	Transportation Mode Shares of Jakarta - Related Person Trips, 1985(trips/day).....3-18
3.1.4.1	Trend of Motor Vehicle Ownership in Jakarta.....3-22
3.2.1.1	Number of Trains (per day, both directions).....3-31
3.2.1.2	Operation Heads.....3-31
3.2.1.3	Arrival Times and Schedule Speeds of JABOTABEK Trains.....3-32
3.2.1.4	Number of Cars in Depots in the JABOTABEK Area.....3-34
3.2.1.5	Use of Electric Cars and Diesel Cars.....3-36

3.2.1.6	Power Car Crew.....	3-36
3.2.1.7	Number of Operating Accidents by Year (West Java).....	3-39
3.2.1.8	Train Delay Time.....	3-40
3.2.1.9	Schedule Speeds of JABOTABEK Trains.....	3-40
3.2.2.1	Stations in the JABOTABEK Area.....	3-47
3.2.2.2	The Existing Level Crossing Protection Devices.....	3-55
3.2.2.3	Present Substation Capacities.....	3-61
3.2.3.1	Trends of Transportation Volume, Number of Workers and Business Kilometers.....	3-66
3.2.3.2	Balance Sheet of PJKA 1983 - 1987.....	3-75
3.2.3.3	Loss and Profit Account of PJKA 1982/83 - 1986/87.....	3-76
3.2.3.4	Change of Passenger Fare Traffic of PJKA.....	3-77
3.2.3.5	Loss and Profit Account of JABOTABEK KA 1984/85 - 1987/88.....	3-78
3.2.3.6	Total Revenues and Expenses of Major Private Railways in Japan ..	3-86
3.2.3.7	Railway-related Revenues and Expenses of PJKA and Major Japanese Private Railways (Fiscal 1987)	3-87
3.2.3.8	Railway-related Revenues and Expenses of PJKA and JR Companies ..	3-88
3.2.3.9	Business Indicators for PJKA and Major Japanese Private Railways.....	3-89
3.2.3.10	Business Indicators for PJKA and JR Companies (Fiscal 1987)	3-90
3.3.1.1	Registered Bus Fleets (Routes) in JABOTABEK.....	3-91
3.3.1.2	Inter-City Bus Operators in JABOTABEK.....	3-92
3.3.1.3	Characteristics of Fixed Route Bus Services in Jakarta, 1988.....	3-94
3.3.1.4	Change of PPD Bus Speeds in Jakarta, 1982-1989.....	3-95
3.3.1.5	Load Factors of Inbound Buses in Daan Mogot, Gaja Mada, Sudirman and Srengseng Sawah.....	3-96
3.3.1.6	Degree of Network Overlap Among Bus Categories.....	3-97
3.3.1.7	Scale of Bus Operation at Bus Terminals (City Service Only).....	3-104
3.3.1.8	Agencies Responsible for Planning Construction, Operation and Maintenance of Bus Related Facilities Jakarta.....	3-105

3.3.1.9	Fixed Route Bus Operators in DKI Jakarta, 1988.....	3-106
3.3.1.10	Efficiency Indices of Bus Companies.....	3-107
3.3.2.1	Road Development Projects to be Completed by 1992.....	3-110
3.3.2.2	Road Development Plan for 2005.....	3-113
3.3.2.3	Bus Fleets Expansion Target.....	3-118
3.3.2.4	Summary of Status and Completion Prospects of Bus Improvement Measures and Traffic Management Schemes	3-122
3.3.2.5	Expected Impacts of Bus Service Improvements and Traffic Improvement Measures	3-123
3.4.1.1	Access Mode Composition to/from JABOTABEK Railway.....	3-124
3.4.1.2	Modal Composition of Access Transportation Modes Railway Stations.....	3-126
3.4.1.3	Car Ownership of Bus and Rail Users.....	3-128
3.4.1.4	Estimated Railway Access Trip Length on Foot and by Buses.....	3-128
3.4.1.5	Public Transportation Passengers' Reasons for Not Using Bus or Rail Services.....	3-131
3.4.1.6	Railway Users Comments on Railway Services.....	3-133
3.4.1.7	Bus Users' Comments on Bus (and Railway) Services.....	3-134
4.1.2.1	Traffic Share by Transportation Mode in Major Cities of the World.....	4-3
4.1.2.2	Efficiency of Subway Versus Bus.....	4-4
4.1.2.3	Operation Cost of Rapid Railway Versus Buses.....	4-5
4.1.2.4	Number of People Killed in Accidents by Mode of Transportation in Japan.....	4-9
4.1.2.5	Grant for Urban Transportation in North America and Canada.....	4-11
4.1.2.6	Financial Resources Used in Constructing Guided Transportation Systems in Various Cities of the World.....	4-12
4.1.2.7	Recycling of Development Benefits.....	4-12
4.3.1.1	Railway Improvement Cases.....	4-20
4.3.1.2	Base Cases.....	4-21
4.4.3.1	Required Transfer Time in Future.....	4-30

5.2.1.1	Option "a" Transportation Capacity (1992).....	5-7
5.2.1.2	Headways of Options "a" and "b".....	5-8
5.2.1.3	Facility Improvements Classified by Alternatives (Related to train service).....	5-10
5.2.1.4	Train Headway on the Serpong Line during Peak Hours.....	5-11
5.2.3.1	Project Items for Option "a".....	5-15
5.2.3.2	Project Items for Option "b".....	5-18
5.2.4.1	Total Financial Cost of Option "b".....	5-21
5.2.4.2	Economic Cost of Railway Investment (Option "b").....	5-23
5.2.4.3	Additional Investment of Rolling Stocks.....	5-24
5.2.4.4	Useful Life and Residual Value.....	5-25
5.2.4.5	Maintenance Rate by Railway Assets.....	5-26
5.2.4.6	Operation Costs of Option "a" and "b".....	5-27
5.2.4.7	Average Personnel Cost.....	5-27
5.2.4.8	Unit Prices of Vehicle Operation Cost Component.....	5-29
5.2.4.9	Economic Operating Cost of Road Vehicles.....	5-30
5.2.4.10	Time Savings by Mode.....	5-31
5.2.4.11	Time Value Estimates by Mode.....	5-31
5.2.4.12	Economic Analysis of Option "b" Railway Investment Project.....	5-33
5.2.4.13	Result of Sensitivity Analysis	5-32
5.2.4.14	Residual Value.....	5-35
5.2.4.15	Sensitivity Analysis.....	5-37
5.2.4.16	Financial Analysis of B-option (Base Case).....	5-37
5.2.4.17	Financial Analysis of B-option (Investment 10% Up).....	5-38
5.2.4.18	Financial Analysis of B-option (Revenue 1% Down).....	5-39
5.2.4.19	Financial Analysis of B-option (Investment 10% Up/Revenue 10% Down).....	5-40
5.3.1.1	Train Head for Alternative Ry (during morning peak hour).....	5-44
5.3.1.2	Maximum Transportation Capacity by Alternative	5-45

5.3.1.3	Travel Time by Alternative	5-46
5.3.1.4	Numbers of Trains by Time Zone.....	5-47
5.3.1.5	Schedule Speed by Alternative	5-54
5.3.1.6	Number of Electric Cars and Diesel Cars by Alternative.....	5-55
5.3.1.7	Operation Frequency by Time Zone of the Middle- and Long- Distance Trains.....	5-57
5.3.1.8	Transportation on the Cibinong Line	5-60
5.3.1.9	Number of Trains on the Cibinong Line	5-60
5.3.1.10	Required Number of Cars by Year	5-61
5.4.5.1	Demand Forecast of Mass Transit.....	5-72
5.4.5.2	Maximum Transportation Capacity of Each System.....	5-75
5.4.5.3	Costs of Systems Under Case 1 Running Levels.....	5-80
5.4.5.4	Costs of Systems Under Case 2 Running Levels.....	5-81
5.4.5.5	System Cost.....	5-82
5.4.5.6	Criteria for Assessment.....	5-84
5.4.5.7	Characteristics of the System	5-85
5.5.1.1	Cost Estimation for Each Case.....	5-88
6.2.2.1	Bus Passenger Counting Survey Results.....	6-9
6.2.2.2	Estimated Railway Passenger Number at the Selected Section.....	6-10
6.2.2.3	Observed and Estimated Traffic on Selected Links.....	6-18
6.3.1.1	Future GRDP in JABOTABEK Area (1988 constant price).....	6-27
6.3.1.2	Future Population and Employment.....	6-28
6.3.2.1	Demand Forecast Cases.....	6-32
6.3.3.1	Total Person Trips and Population 1972-2005.....	6-38
6.3.3.2	Person Trip Rate in Selected Cities.....	6-38
6.3.4.1	Transportation Demand Forecast Results.....	6-40

7.1.2.1	Investment Cost of Railway Project (Case 051-053)	7-7
7.1.2.2	Investment Cost of Railway Project (Case 051-056)	7-8
7.1.2.3	Economic Investment Cost of Railway Project	7-9
7.1.2.4	Annualized Investment Cost of Railway Project	7-9
7.1.2.5	Road Investment Cost - BC01 and BC02 -	7-9
7.1.2.6	Annualized Investment Cost of Mass Transit System.....	7-9
7.1.3.1	Annual Maintenance Cost of Railway Masterplan.....	7-11
7.1.3.2	Annual Operation Cost of Railway Masterplan.....	7-11
7.1.3.3	Maintenance and Operation Costs of Mass Transit System.....	7-13
7.1.3.4	Time Saving Benefit of Freight Transport by Cibinon Line Project.....	7-13
7.1.3.5	Waiting Time at Railway Crossing	7-14
7.1.3.6	Time Saving Benefit at Railway Crossing.....	7-15
7.1.3.7	Benefits from Land Utilization	7-13
7.1.4.1	Result of Generalized Cost Analysis by Case.....	7-16
7.2.1.1	Characteristics of Alternative Patterns.....	7-18
8.2.2.1	Existing Level Crossing on E/L.....	8-9
8.2.1.2	Existing Level Crossing on W/L.....	8-11
8.3.1	Investment Schedule for Railway Improvement (Ry2).....	8-24
8.3.2	Investment Schedule for Road Improvement (BC01).....	8-25
8.4.3.1	Future Traffic Volume at Railway Crossing (East and West Lines)..	8-37
8.4.3.2	Future Vehicle Traffic Forecast of Central Line Railway Crossings.....	8-38

List of Figures

Fig.		
2.3.2.1	Planning History of JABOTABEK.....	2-15
2.3.2.2	Regional Development Strategy Established by JMPD.....	2-17
2.3.2.3	DKI Jakarta Structure Plan 2005.....	2-21
2.3.2.4	JABOTABEK Region Structure Plan 2005	2-24
3.1.2.1	Existing Railway Network.....	3-3
3.1.2.2	Urban Land Use Development and Railway Network Low Degree of Coordination.....	3-4
3.1.2.3	Arterial Road Network in JABOTABEK Area.....	3-7
3.1.2.4	Bus Network in Jakarta, 1989 (Large and medium bases).....	3-9
3.1.2.5	BOTABEK Inter-city Bus Network.....	3-10
3.1.3.1	Number of JABOTABEK Train Passengers by Section.....	3-16
3.1.3.2	Person Trip Movements by Bus and Rail.....	3-17
3.1.3.3	Model Split of Work Trips in BOTABEK Zones.....	3-20
3.1.3.4	Rail Advantaged O.D. Pairs.....	3-21
3.2.1.1 (1)	Train Operation Route of Central Line.....	3-26
3.2.1.1 (2)	Eastern Line and Western Line	3-26
3.2.1.1 (3)	Serpong Line and Tangerang Line (Diesel Railcar and Passenger Car Train).....	3-27
3.2.1.1 (4)	Central Line and Western, Bekasi Line (Commuter Diesel Railcar Train).....	3-27
3.2.1.1 (5)	Middle and Long Distance Passenger Train.....	3-28
3.2.1.1 (6)	Freight Train.....	3-28
3.2.2.1	Situation of Existing Stations.....	3-46
3.2.2.2	Present Situation of Jakarta Kota Station.....	3-48
3.2.2.3	Present Situation of Jatinegara Station.....	3-49
3.2.2.4	Signalling System in the JABOTABEK Area (as of 1988).....	3-54
3.2.2.5	Network of Radio Link System and Utility Radio System.....	3-57

3.2.2.6	Automatic Exchange Telephone Networks System in Jabotabek.....	3-58
3.2.2.7	Existing Telephone and Morse Telegraph Networks.....	3-59
3.2.2.8	Electrified Area.....	3-61
3.2.2.9	Organization for the Maintenance of the Substations	3-62
3.2.2.10	The Maintenance Area of the Substations	3-63
3.2.3.1	Organization Chart of Minister of Communication.....	3-67
3.2.3.2	Organization Chart of PJKA (Head Office).....	3-68
3.2.3.3	Organization Chart of PJKA (Weilayah Usaha Jawa).....	3-69
3.2.3.4	Organization Chart of PJKA (Daerah Operasi)	3-70
3.2.2.5	Change of Passenger Fare Tariff of PJKA	3-77
3.3.1.1	Large Bus Network (Biskota, Patas).....	3-101
3.3.1.2	Medium Bus Network (Metro Mini Copaja).....	3-102
3.3.1.3	Small Bus Network (Microlet, APK).....	3-103
3.3.2.1	The Location of Road Improvement Project.....	3-112
3.3.2.2	Site of New Bus Terminals.....	3-117
3.4.1.1	Bus- Rail Integration of JABOTABEK Railway Stations.....	3-129
3.4.1.2	Railway Access Trip Patterns (Expressed as lines between zone Centroid & Stations).....	3-130
3.4.2.1	Pasar Minggu General Layout.....	3-136
3.4.2.2	Lenteng Agung General Layout.....	3-136
3.4.2.3	Depok General Layout.....	3-138
3.4.2.4	Proposed New Bus Bay on Jl. Juanda.....	3-139
3.4.2.5	Jatinegara General Layout Plan.....	3-140
3.4.2.6	Minimum Required Area for Station Plaza.....	3-141
3.4.2.7	Depok Baru Station Layout.....	3-141
4.1.2.1	Location Map of Traffic Congestion Problems.....	4-7
4.1.2.2	Energy Consumptions by Major Transit Systems (1985).....	4-8

4.2.1.1	Alternative Pattern Formed by Combination.....	4-16
4.2.1.2	Improvement Level and Generalized Cost.....	4-18
4.4.1.1	Public Transportation Network.....	4-23
4.4.2.1	Access and Egress Modes to Railway Station.....	4-24
4.4.2.2	Existing Transportation Mode for Main Station.....	4-26
4.4.2.3	Basic Pattern of Direct Feeder System.....	4-27
4.4.3.1	Composition of Transfer Factors.....	4-29
4.4.4.1	Shuttle Service Plan between Railway Station and Bus Terminal.....	4-31
5.2.1.1	Train Operation Route (a option, b option).....	5-3
5.2.1.2	Maximum Transportation Capacity of "a" and "b" Option.....	5-12
5.2.1.3	Travel Time of the Present, a Option and b Option.....	5-13
5.3.1.1	Train Operation Route (Ry1).....	5-43
5.3.1.2	Train Operation Route (Ry2).....	5-48
5.3.1.3	Train Operation Route (Ry3).....	5-52
5.3.2.1	Function of Proposed Feeder Service	5-64
5.4.4.1	Routes of Mass Transit Corridor.....	5-69
5.4.5.1	Flow of System Selection.....	5-71
5.4.5.2	The Peak Hour One Way Hourly Maximum Sectional Traffic Volume (2005)	5-73
5.4.5.3	Increase of Demand.....	5-77
5.4.5.4	Running Levels	5-78
6.1.2.1	Procedure of Demand Forecast.....	6-1
6.2.1.1	Traffic Zones for DKI Jakarta.....	6-5
6.2.1.2	Traffic Zones for Botabek.....	6-6
6.2.2.1	General Flow Chart of Forecasting System Development.....	6-7
6.2.2.2	Conceptual Diagram of Road.....	6-13

6.2.2.3	Conceptual Diagram of Bus Network.....	6-13
6.2.2.4	Conceptual Diagram of Railway Network.....	6-14
6.2.2.5	Model Validation and Update of Trip Tables.....	6-15
6.2.2.6	Relationships between Trip Generation/Attraction and Employment (DKI Jakarta).....	6-20
6.2.2.7	Relationships between Trip Generation/Attraction and Population (DKI Jakarta).....	6-20
6.2.2.8	Relationships between Trip Generation/Attraction and Population (Botabek).....	6-21
6.2.2.9	Relationships between Trip Generation/Attraction and Population (other area).....	6-21
6.2.2.10	Time Value Mode Split Model.....	6-24
6.2.2.11	Mode Split Model Estimation.....	6-26
6.3.1.1	Change in Distribution of Population in DKI Jakarta, 1988 - 2005.....	6-29
6.3.1.2	Change in Distribution of Employment in DKI Jakarta, 1988 - 2005.....	6-30
6.3.1.3	Change in Distribution of Population in Botabek,1988-2005.....	6-31
6.3.4.1	Future Demand by Mode and by Case.....	6-40
6.3.4.2	Aggregated Traffic Zones.....	6-41
6.3.4.3	Person Trip Flows by Railway in JABOTABEK, 2005: - By Large Zone -	6-42
6.3.4.4	Person Trip Flows by Railway in JABOTABEK, 2005 Case: (Basic Case = 01; Ry-02) - By Large Zone -	6-43
6.3.4.5	No. of Railway Passengers (Case: b option).....	6-45
6.3.4.6	No. of Railway Passengers (Case 052: Ry2,BCO1).....	6-46
6.3.4.7	No. of Railway Passengers (Case 055: Ry2,BCO2).....	6-47
6.3.4.8	Number of Bus Passengers.....	6-48
6.3.4.9	Traffic Volume in PCU.....	6-49
6.3.4.10	Freight Transportation by Cibinong Line.....	6-50

7.2.1.1	Annualized Generalized Cost Saving vs. Annual Average Investment Cost for Each Alternative Pattern.....	7-19
7.2.1.2	Annual Average Investment Cost.....	7-20
8.2.1.1	Railway Improvement Plan (Ry2).....	8-3
8.2.1.2	General View of New Kota Station.....	8-6
8.2.1.3	Existing Level Crossing (E/L, W/L).....	8-8
8.2.1.4	Location of New Stations.....	8-14
8.2.1.5	Proposed Traffic Control System and Access Road.....	8-17
8.2.1.6	Access to Small Size Station Plaza.....	8-18
8.4.1.1	Passengers Getting on and off Trains at Stations (1985 and 1992, Option "b").....	8-28

List of Abbreviations

ABBREVIATION	FULL NAME	LOCATION
Ac	Ancol Station	Tangjungpriok Line
Ak	Angke Station	Western Line
Bid	Bojonggede Station	Central Line
Bin	Bintaro	Serpong Line
Bks	Bekasi Station	Bekasi Line
Boo	Bogor Station	Central Line
Cit	Cilebut Station	Central Line
Cki	Cikini Station	Central Line
Cpn	Cipinang Staton	Bekasi Line
Cta	Citayam Station	Central line
Cuk	Cakung Station	Bekasi Line
Dp	Depok Station	Central Line
Dpb	Depok baru Station	Central Line
Drn	Duren kalibata Station	Central Line
Du	Duri Station	Western Line
Dkh	Dukuh Station	Western station
Gdd	Gondangdia Station	Central Line
Gmr	Gambir Station	Central Line
Gsi	Gang Sentiong Station	Eastern Line
Jng	Jatinegara Station	Western Line
Jak	Jakarta Kota Station	Central Line
Kat	Karet Station	Western Line
Kby	Kebayoran Station	Serpong Line
Kds	Kalideres Station	Tangerang Line
Kld	Klender Station	Bekasi Line

ABBREVIATION	FULL NAME	LOCATION
Kldb	Klender baru Station	Bekasi Line
Kmo	Kemayoran Station	Eastern Line
Kmt	Kramat Station	Eastern Line
Kpb	Kampungbandan Station	East of Jakg Station
Kri	Kranji Station	Bekasi Line
Lna	Lenteng Agung Station	Central Line
Mam	Mampang Station	Western Line
Mri	Manggarai Station	Western Line
N-Jak	New Jakartakota Station	Central Line
N-Kpb	New Kampungbandan Station	Eastern Line
Plm	Palmerah Station	Serpong Line
Pnd	Pondok bitung Station	Serpong Line
Poc	Pondok Station	Central Line
Pok	Pondok Jati Station	Eastern Line
Pse	Paser Senen Station	Eastern Line
Psg	Pesing Station	Tangerang Line
Psm	Pasarminggu Station	Central Line
Rjw	Rajawari Station	Eastern Line
Rk	Rangkrsetung	Serpong Line
Ru	Rawabuntu Station	Serpong Line
Rw	Rawabuaya Station	Tangerang Line
Sdm	Sudimara Station	Serpong Line
Srp	Serpong Station	Serpong Line
Sw	Sawahbesar Station	Central Line
Teb	Tebet Station	Central Line
Thb	Tanah Abang Station	Western Line
Tng	Tangerang Station	Tangerang Line

ABBREVIATION	FULL NAME	LOCATION
Tpk	Tanjungpriok Station	Tanjungpriok Line
Ui	Uni. Pancasila Station	Central Line
Up	Uni. Indonesia Station	Central Line
C/L	Central Line	Jak-Boo
E/L	Eastern Line	Jak-Pse-Jng Tpk-Kmo
W/L	Western Line	Jak-Thb-Jng
Bks/L	Bekasi Line	Jng-Bks
Tpk/L	Tanjungpriok Line	Jak-Tpk
Tng/L	Tangerang Line	Du-Tng
Srp/L	Serpong Line	Thb-Srp

Abbreviations and Acronyms for Jabotabek Study

ARSDS	- Arterial Road Systems Development Study
BAPPENDA, DKI	- DKI Jakarta Region Development Planning Board
BAPPENAS	- National Development Planning Agency
Bina Marga	- Directorate General Bina Marga (Highways), MPW
BKSP	- Jabotabek Level I Planning Coordination Unit
DAMRI	- State-owned Bus Company Serving Regional Cities
Dinas LLAJR	- Traffic and Highway Transportation Department, DKI-Jakarta
Dinas PU	- Public Works Department, DKI Jakarta
Dinas Tatakota	- Urban Planning Department, DKI Jakarta
DKI Jakarta	- Jakarta Special Capital Province
GOI	- Government of Indonesia
INPRES	- Central Government Grant to Local Governments
JABOTABEK	- Region comprising Jakarta, Bogor, Tangerang and Bekasi local government administrative areas
JASA Marga	- Public Corporation responsible for constructing expressways
JICA	- Japan International Cooperation Agency
JUDP	- Jabotabek Urban Development Project
JUPCO	- Project Coordination Unit in DKI-Jakarta BAPPEDA
JUPT	- Jakarta Urban Transport Project
KIP	- Kampung (Village) Improvement Program
LLAJR	- Directorate of Highway Transport, PHBD
LLAK	- Directorate of Urban Traffic and Transport, PHBD
MHA	- Ministry of Home Affairs
MOC	- Ministry of Communication
MOF	- Ministry of Finance
MPW	- Ministry of Public Works

- PHBD - Directorate General Perhubungan Darat (Land Transport), MOC
- PJKA - State Railway
- PPD - State-Owned bus company serving Jakarta
- REPELITA - National Five-year Development Plan (Repelita IV, 1984-89; Repelita V, 1989-94)
- TKPP - Tim Koordinasi Pembangunan Perkotaan (Interagency Coordinating Team for Urban Development)

CHAPTER 1 INTRODUCTION

CHAPTER 1 Introduction

1-1 Background of the Study

JABOTABEK Area which consists of DKI Jakarta, Bogor, Tangerang, and Bekasi Area has been in the forefront of industrial and economic activities in Indonesia and its population has reached about 15 million recently.

Metropolitan transportation of commuters depends mainly on roads. The roads are congested heavily and chronically and metropolitan transportation in the area seems to be facing a critical stage.

Under these circumstances, the Government of Indonesia and DKI Jakarta have been taking many measures, including implementation of city development plans, railway plans and road plans.

In 1981, the long term Master Plan for railway transportation aimed at the year 2000 was studied and formulated by JICA. The plan includes track doubling, electrification, track elevation, automatic signalling, improvement of stations, reinforcement of rolling stock, workshops and depots, and the construction of a new Cengkareng airport line.

The plan was revised by the Indonesian Government in 1985 through the "Review of Feasibility Study", taking into account the subsequent financial situation, and was recomposed into the "Master Program" aimed at 2005.

The first stage of the Master Program is now under way for completion in 1992. This Master Program is aimed at assuring the railway about a 15% share of Jabotabek urban transportation in 2005 by reinforcing the basic railway facilities.

On the other hand, roads are under construction in accordance with metropolitan development plans, but they are confronted with heavier traffic volume than expected. To basically resolve the problems in metropolitan road transportation, the Arterial Road System Development Study in JAKARTA

Metropolitan Area (hereinafter referred to "ARSDS") was conducted in 1987 with the cooperation of the Japanese Government.

The plans for improvement and development of railway and road transportation mentioned above have been respectively established without due consideration on integration of transportation system as a whole. Considering long term metropolitan development, the Indonesian Government is in pressing need of an integrated transportation system plan integrating the railway and road modes, in addition to the individual railway and road plans.

Under these circumstances, the Indonesian Government has requested the Japanese Government to formulate an integrated transportation system plan in JABOTABEK Area to enhance the role of the railway in metropolitan transportation in close coordination with road transportation and metropolitan development plans.

1-2 Objective of the Master Plan Study

This Study, intended for formulation of the Master Plan for integrated transportation system in JABOTABEK Area, will be carried out based on the scope of work agreed upon 1988 between Indonesian government and JICA scope of work mission dispatched in January 1988 in compliance with the request of the Indonesian Government. Under this study program, a master plan up to 2005 will be formulated, and a feasibility study be made of the projects of high priority.

In JABOTABEK Area, the railway is extending radially in four directions from the center of DKI Jakarta to connect the peripheral cities and also is forming a loop within DKI Jakarta. Thus, it comprises five lines so long as the route is concerned. But, it had the facilities deteriorated and was in shortage in maintenance as well as in number of the facilities and cars so that it had scarcely exhibited its function as a transportation system for commutation and school attendance. However, through implementation of the "Intermediate Program", it gradually had the function recovered and the passengers increased.

For the existing railway, efforts are being made for improvement and modernization of the existing network and facilities along the "Master Program." But, the improvement is not in progress as scheduled on account of

the changing economic situation in Indonesia. In the present study, the railway improvement up to 1992 is taken as a precondition, and the direction of improvement thereafter will be presented.

For the road plan, improvement is made according to the "JABOTABEK Area Development Plan 2005" and "Jakarta City Development Plan 2005," and there is the "Arterial Road System Development Study in Jakarta Metropolitan Area (ARSDS)" proposed by JICA in 1987.

But, these plans are not satisfactory in the view of utilizing the railway fully for formation of an integrated urban transportation network in the Jakarta metropolitan area.

Under the present study, there will be prepared a plan which is directed toward organic harmony of both railway and road plan along the development plans of the Jakarta metropolitan area so that both railway and road will be able to fully exhibit their functions respectively for the objectives listed below.

- (1) Preparation of a master plan for integrated transportation system directed to organic linkage of railway and road toward 2005 in the Jakarta metropolitan area.
- (2) Confirmation of the propriety of said integrated transportation system as a whole.
- (3) Confirmation of the feasibility of the urgent development and improvement project.

1-3 Basic Principle of the Study

In considering the master plan for the integrated transportation system in the Jakarta metropolitan area, the starting year will be 1990, and the target year be 2005 for the purpose of the study.

For the basic economic frame in the future, the plans on the part of Indonesia in the national and local levels will be taken for reference, and the studies so far made will be reviewed thoroughly.

In formulating the plan, consideration will be made for improvement of the facilities through maximum use of the existing railways, while examination be

made of the improvement of the feeder service, station plaza, transfer facilities and station facilities for improvement of the access of railway and road so that the integrated transportation will be ensured and thus that the passengers be increased.

For the railway demand forecast, the ARSDS's person trip survey conducted in 1985 will be utilized, and it will be supplemented by questionnaire and traffic volume fact finding surveys for some areas.

For the transportation, separate operation of the commuter transportation and the freight and medium/long distance passenger transportation and incidental separation of the terminal will be examined. For the Kota Station particularly, relocation will be examined in consideration of the city development plan, effective use of the site, etc.

For the future plan, the concept of a new transportation network including a plan of new lines will be proposed.

For selection of the optimum plan among the alternative patterns established through combination of the investment levels of rail and road, the minimum generalized cost and the overall evaluation by the various experts of Indonesian government will be taken into consideration.

1-4 Organization of the Study

The JICA Advisory Committee, Study Team and Indonesian Counterparts concerned with the study are as follows.

(1) JICA advisory committee

- | | |
|-------------------|--------------------------------|
| 1) Makoto MOMOSE | Chairman |
| 2) Naoto EGAWA | Railway Facilities Planning |
| 3) Katsuhiko HARA | Public Transportation Planning |

(2) JICA staff

Toshiichi MINATANI	Coordinator
Shingo SAITOH	Coordinator

(3) Study team

Misao SUGAWARA	Study Team Leader
Sadaaki KURODA	Deputy Team Leader
Kunitaka NAMIKAWA	Acting Leader/System Planning
Yoshikazu UMEKI	Transportation Demand Forecast/Economic Analysis
Tei KOJIN	Transportation Planning
Harumi TAKASHIMA	Track and Structure Planning
Kichimatsu NARITA	Station Yard Planning
Yukinori WATANABE	Station Yard Planning
Susumu SHIBUYA	Rolling Stock Planning
Yukio CHIKADA	Electrification Planning
Kazumaru SHINOYA	Signalling & Telecommunication Planning
Kenji MAEDA	Feeder Service Planning
Chiaki KURANAMI	Public Transportation Analysis
Tadashi ISHIKAWA	Feeder Facilities Planning
Takashi KADOTA	Related Development Planning
Naoyasu HAYASHI	Financial Analysis/Railway Management
Hideo ARIKAWA	System Analysis

(4) Indonesian counter parts

DAFTAR YANG DIUNDANG

1. Ir. Mulyadi Hadikusumo Bag. Perenc. Ditjen. Phbd.
2. Ir. Udji Atmono Direktorat LLAk.
3. Ir. Harris Fabillah Direktorat LLAk.
4. Ir. Iskandar Abubakar MSc Direktorat LLAk.
5. Drs. Umar Rusdi Biro Perencanaan Dep. Hub.
6. Drs. Arsyad Idrus Biro Perhubungan dan Pariwisata Bappenas.
7. Ir. Erlan Prasetyo Perum PPD.
8. Drs. Sobri Nawawi Perum PPD.
9. Ir. Darwin Simbolon MStr Kanwil Dep. Hub. DKI Jakarta.
10. Imran Muhammad SH Kanwil Dep. Hub. DKI Jakarta.
11. Drs. Hendi Soedjono Ketua Bappeda Kab. Tangerang.
12. Drs. H. Dede Satidi Ketua Bappeda Kab. Bekasi.
13. H. Endang Soewardi SH Ketua Bappeda Kab. Bogor.
14. Ir. Irzal Djamal Bappeda DKI Jakarta.
15. Ir. M. Zaky Bag. Perencanaan Ditjen. Phbd.
16. Ir. Tauchid MSc Dinas LLAJR DKI Jakarta.
17. Drs. Yusfik Helmy Dit. LLAk.
18. Drs. Syamsul Bachri Dit. LLAJR.
19. Anton Tampubolon SH Dit. LLAJR.
20. Ir. Kusbini Biro Perencanaan Dep. Hub.
21. Ir. Perlindungan Tarigan Biro Perencanaan Dep. Hub.
22. Drs. Simon Ratu Oedjoe Badan Litbang Dep. Hub.
23. Ir. Bernaldi Ditjen. Bina Marga.
24. Ir. Janeydi Juni Ditjen. Bina Marga.
25. Ir. Bambang A. Pratiknyo Pusren PJKA.

- | | | |
|-----|---------------------------|--------------------------------|
| 26. | Drs. Sri Kuncoro | Pusren PJKA. |
| 27. | DR. Indrayati TM | BPPT. |
| 28. | Ir. Heru Sasongko | KA JABOTABEK. |
| 29. | Ir. Bernita Rambe | KA JABOTABEK. |
| 30. | Ir. Yuliarso | BPPT. |
| 31. | Ir. Betsy Halah Surti | Bag. Perencanaan Ditjen. Phbd. |
| 32. | Ir. Nugroho Indrio MSc | Proyek JABOTABEK KA. |
| 33. | Ir. Achmad Nurjaeni | Dinas Tata Kota DKI Jakarta. |
| 34. | Ir. Bambang Winarto | Direktorat Teknik. |
| 35. | Ir. Wasisto Wibowo | Direktorat Teknik. |
| 36. | Ir. Irwan N. Sardjono | Direktorat Teknik. |
| 37. | Ir. Asmeidi Asrin | Direktorat Teknik. |
| 38. | Ir. Yudarso | Direktorat Teknik. |
| 39. | Ir. Mashudijanto | Direktorat Teknik. |
| 40. | Drs. Hadiyono | Direktorat Keuangan. |
| 41. | Drs. Suyatno | Direktorat Pemasaran. |
| 42. | Drs. Alfian Wachid | Direktorat Pemasaran. |
| 43. | Drs. Agus Wahjono | Direktorat Pemasaran. |
| 44. | Atjeng Wirasasmita | Direktorat Operasi. |
| 45. | Drs. Patria Suprijoso | Direktorat Operasi. |
| 46. | Drs. Muridan | Direktorat Operasi. |
| 47. | Sukiswo | Direktorat Operasi. |
| 48. | Ir. Faisal | Direktorat Operasi. |
| 49. | Ir. Subagio Ahmad Sarwono | Direktorat Operasi. |
| 50. | Ir. Masjraul Hidayat | Inspeksi I Jakarta. |
| 51. | Ir. Eddy Sasongko | Inspeksi I Jakarta. |

1-5 Preparation of the Final Report

The Final Report has been prepared in two volumes. Volume I contains the results of the study including preparation of the Master Plan and selection of urgent projects for the feasibility study. It was originally presented for discussion to the Indonesian Government as the Interim Report I in September 1989.

Volume II contains the results of the feasibility study of selected urgent projects. It was originally presented for discussion to the Indonesian Government as the Interim Report II in January 1990.

The Interim I and Interim II were both modified based on the discussion between the Indonesian Government and the JICA Study Team and were compiled respectively as Volume I and Volume II of the Draft Final Report.

The Draft Final Report was presented to the Indonesian Government for review and it has finally been compiled as the Final Report after the discussion with the Indonesian Government.

**CHAPTER 2 PRESENT SOCIO-ECONOMIC CONDITIONS AND
FUTURE DEVELOPMENT PERSPECTIVE OF
JABOTABEK**

CHAPTER 2 Present Socio-economic Conditions and Future Development Perspective of Jabotabek

2-1 Overview of Present and Future Jabotabek

2-1-1 Present Contexts of Jabotabek

Indonesia's population growth rate has been declined gradually during 1971 - 85; but Jakarta has unchanged the high population growth rate and it grew up at an annual rate of 3.9 %, attracting new migrants from the whole country. -- The country's population growth rate dropped from 2.39% (during 1971 - 80) to 2.15% (during 1980 - 85); but Jakarta's annual growth rate exceeded largely over the country's annual rate by 1.58% high (during 1971 - 80) to 1.78% high (during 1980 - 85).

Furthermore, economic activities of Jakarta have increased by higher growth rate than the population did. -- The Gross Regional Domestic Product (GRDP) of Jakarta increased at an annual rate of about 10% against the background that the Indonesia's economic growth rate fallen into 5.0% a year in early 1980's against a 8.1% high growth in 1970's.

As a result, Jakarta that occupies only 0.03% of Indonesia's land contains 4.8% of the country's population (1985 Inter-census) and contributes 12.4% of the Indonesia's Gross Domestic Product (in 1985). Jakarta is just the national growth center.

Gross population density of Jakarta reached at 150 person per hector in 1985; new housing demands or population impacts caused by Jakarta's potential have spilled over into Botabek, in particular, Bekasi, Tangerang and other areas neighboring Jakarta. The current front of development actions reaches at 20 to 30 km far suburbs from the center of Jakarta.

A great deal of housing development projects on-going/committed are concentrated into the area between the both railway corridors of Tangerang Line and Serpong Line and the east corridor including Bekasi Line and Jakarta-Cikampek Toll Road follows it.

2-1-2 Future Development Strategies and Perspective

Jabotabek consists of: 1) DKI Jakarta, a first-level autonomy out of the 27 ones in Indonesia; and 2) Botabek, four second-level autonomies in West Java Province. It is a regional development unit of National Five-year Development Plan (REPELITA); the key concept for developing Jabotabek, as REPELITA V presents, is to integrate potential development actions attracted into Jakarta with developing Botabek as a metropolitan area.

Jabotabek area defined its spatial development strategies based on the regional environmental identifications (mainly the regional river and ground water systems), in early 1980's ("Jakarta Metropolitan Development Plan", 1983), as follows:

- Distributive Development Policy in population and urban activities to avoid the over-concentration into the central Jakarta
- East-and-West Expansion Strategy to introduce future urban areas

Local authorities' Structure Plans prepared after 1984 are based on the above-mentioned spatial development strategies. Current regional development frame adopts a 12 million population for Jakarta (in 2005) and 11.5 million for Botabek.

Because the DKI's population growth during 1980 to 1985 was rather higher than the Structure Plan projected, it is expected that Jakarta will reach at the target of a 12 million population before 2005; but the current regional development strategy emphasizes that Jakarta's population growth should be controlled and a part of new development actions should be introduced into Botabek.

From a regional viewpoint, the current spatial planning policy placed the railway corridors or station areas, as follows:

- a) Future urban activity centers within Jakarta are/will be within the major station's vicinities.

- b) future suburban housing developments and regional centers will include railway corridors

However in the district-level, current urban development plans are not yet coordinated with the rail-and-feeder service improvement, namely rail-based commuter service introduction, for example on the land use and road network around stations and the implementation programs.

2-2 Present Socio-economic Conditions

2-2-1 Population

(1) National and regional situations

The country's population has growth at 164 million in 1985 or 1.7 times during 24 years. However the annual growth rate in the whole country fell from 2.39% in 1971 - 80 to 2.15% in 1980 - 85.

Region-wide tendency. DKI Jakarta, with Sumatra, unchanged the high growth rate, such as 3.97% (1971 - 1980) and 3.93% (1980 - 1985); its high growth depends on active in-flow of migrants. West Java, including Botabek, is likely to equal the country's average growth rate; the population out-flow and in-flow are expected to be balanced. On other hand, the population growth rate in both Java of Central and East have been lower than the country's average during the period of 1961 to 1985. (See, Table 2.2.1.1.)

According to a population projection for 1985 up to 2000 that the Central Bureau of Statistic (BPS) carried out based on Intercensus 1985, the Indonesia's total population will be 175.2 million for 1988 by a 2.10-percentage annual growth rate during 1985 - 90; and DKI Jakarta at 8.86 million by 3.83%; and West Java at 33.9 million by 2.25%, as shown in Table 2.2.1.2.

Table 2.2.1.1 Population by Province/Region (1961 - 85)

Region/Province	(x 1000, %)								(%) (per km ²)			
	1961 Census		1971 Census		1980 Census		1985 Census		Annual Growth Rate			Density 1985
								1961-71	1971-80	1980-85		
Sumatra	15,739	16.2	20,808	17.5	28,016	19.0	32,603	19.9	2.83	3.36	3.08	69
North Sumatra*1	8,912	9.2	11,408	9.6	14,379	9.8	16,092	9.8	2.50	2.60	2.28	91
South Sumatra*2	6,827	7.0	9,400	7.9	13,637	9.2	16,511	10.1	3.25	4.22	3.90	55
Java	63,060	65.0	76,086	63.8	91,270	61.9	99,852	60.9	1.90	2.04	1.81	755
DKI Jakarta	2,973	3.1	4,579	3.8	6,503	4.4	7,885	4.8	4.41	3.97	3.93	13,365
West Java	17,615	18.1	21,624	18.1	27,454	18.6	30,830	18.8	2.07	2.69	2.35	666
Central Java *3	20,647	21.3	24,361	20.4	28,124	19.1	29,875	18.2	1.67	1.61	1.22	799
East Java	21,825	22.5	25,522	21.4	29,189	19.8	31,262	19.1	1.58	1.50	1.38	652
Other Islands	18,287	18.8	22,314	18.7	28,204	19.1	31,592	19.2	2.01	2.64	2.29	24
Indonesia	97,086	100.0	119,208	100.0	147,490	100.0	164,047	100.0	2.07	2.39	2.15	85

Source: Statistic Indonesia 1987

Note: *1 D.I.Ache, Sumatra Utara, and Sumatra Barat

*2 Remained Sumatra

*3 D.I.Yogyakarta is included.

Table 2.2.1.2 Population Projection by Region for 1985 - 1990 (BPS)

	(x1000)								(%)	
	Census 1980	Inter-census 1985	Projection by BPS						Annual Growth Rate %	
			1985	1986	1987	1988	1989	1990	1980-85	1985-90
North Sumatra	16,548	18,640	18,707	19,145	19,591	20,046	20,510	20,984	2.41	2.32
South Sumatra	11,468	13,963	14,013	14,567	15,144	15,743	16,366	17,012	4.01	3.95
DKI Jakarta	6,503	7,885	7,914	8,215	8,534	8,861	9,199	9,550	3.93	3.83
West Java	27,454	30,830	30,940	31,642	32,357	33,085	33,826	34,580	2.35	2.25
Central Java	28,124	29,875	29,981	30,322	30,665	31,008	31,352	31,697	1.22	1.12
East Java	29,189	31,262	31,373	31,782	32,193	32,607	33,023	33,441	1.38	1.28
Other Islands	28,204	31,592	31,702	32,410	33,130	33,867	34,619	35,386	2.29	2.22
Indonesia	147,490	164,047	164,630	168,086	171,614	175,217	178,895	182,650	2.15	2.10

Source: 'Statistical Year Book of Indonesia 1987', BPS

Note: Projected Population (for 1985-90) is at the End of Years.

North Sumatra: D.I.Ache, Sumatra Utara, Sumatra Barat, and Riau

South Sumatra: Five Provinces remained in Sumatra Island.

Central Java includes D.I.Yogyakarta.

(2) Trends and distribution in Jabotabek

1) Population in Jakarta

Jakarta showed long-term rapid increase in population, such as an annual rate of 4.4% in 1961 - 71, 4.0% in 1971 - 80 and 3.9% in 1980 - 85; then the population reached at 7.89 million in 1985 and is estimated at 8.86 million for 1988, as mentioned above. The annual rate exceeded 2.3% (in 1961 - 71), 1.4% (in 1971 - 80), and 1.7% (in 1980 - 85) over the country's rate, as shown in Table 2.2.1.3.

Furthermore, the registered population within Jakarta in 1981 - 87 revealed: the declining tendency in the central Jakarta; and rapid increasing tendency in the eastern, western and southern suburbs within Jakarta.

2) Population in Botabek

Census of 1971 and 1980 revealed that Botabek shifted to a rapid population growth; the annual rate was changed from 2.3% in 1961 - 1971 to 4.1% in 1971 - 1980; it exceeds the West Java's average growth rate in the same term.

Intercensus 1985 did not estimate Botabek's population. On the other hand, the registered population data within Botabek showed that Botabek's population after 1981 increased at higher growth rate than Jakarta did; it grew up at an annual rate of 4.4% during the period of 1981 to 1986. Furthermore, Kabupaten Tangerang had the highest annual rate of 6.6%, Bekasi followed at 4.9%; but Kab. Bogor and Kotamadya Bogor remained at lower annual rate of 3.4% and 2.4%, as shown in Table 2.2.1.3.

Table 2.2.1.3 Population in JABOTABEK (1961/71/80/85)

Area	km2	POPULATION (CENSUS)				DENSITY (per km2)		Annual Growth Rate (%)					
		1961	1971	1980	1985	1980	1985	1961-71	1971-80	1980-85			
DKI Jakarta	590	2,973	49.7%	4,579	54.9%	6,505	54.6%	7,885	11,022	13,365	4.41	3.97	3.93
BOTABEK	5,709	3,011	50.3%	3,761	45.1%	5,413	45.4%	948	948	13,365	2.25	4.13	4.13
Kab/Kodya. Bogor	3,381	1,468	24.5%	1,865	22.3%	2,741	23.0%	811	811	13,365	2.41	4.38	4.38
Kab. Tangerang	1,044	850	14.2%	1,067	12.8%	1,529	12.8%	1,465	1,465	13,365	2.30	4.08	4.08
Kab. Bekasi	1,284	693	11.6%	831	10.0%	1,143	9.6%	890	890	13,365	1.83	3.61	3.61
Jabotabek	6,299	5,984	100.0%	8,340	100.0%	11,916	100.0%	1,892	1,892	13,365	3.38	4.04	4.04
BOTABEK	5,709	3,011	17.1%	3,761	17.4%	5,413	19.7%	948	948	13,365	2.25	4.13	4.13
West Java	46,300	17,615	100.0%	21,624	100.0%	27,454	100.0%	593	593	13,365	2.07	2.69	2.35
Indonesia	1,919,443	97,086		119,208		147,490		77	77	13,365	2.07	2.39	2.15

Source : Statistical Year Book of Indonesia 1987, BPS
Population Census 1961, BPS

In addition, Kecamatan surrounding Jakarta grew up by a sharply high growth rate of 5.8% a year during 1971 - 80 (in Census); this tendency is expected to be stimulated after 1980.

BPS's projection above-mentioned estimates DKI Jakarta's population for 1988 at 8.86 million by a 3.96% of annual growth rate; on the other hand, the study team estimates the Botabek's population for 1988. 7.16 million by a 3.56% of annual growth rate, based on the registered population's tendencies. As a result, the study team estimates the Jabotabek's population for 1988 at 16.02 million.

2-2-2 Employment Situation

Labor force in the whole country grew at an annual rate of 4.02% a year (1980 - 85) that is relatively high growth reflecting high birth-rates in the 1960's and 1970's.

Labor force in Jakarta grew at an annual rate of 4.85% (1980 - 85) that is 0.83% higher than the country's average. In addition Jakarta's labor force participation rate (against the population group aged 10 and over, namely working-age population) almost unchanged during 1971 - 85, at 42 or 43% a year; on the other hand labor force in Botabek grew at an annual rate of 41.8% in 1980.

Table 2.2.2.1 shows the above-mentioned.

Table 2.2.2.1 Labor Force Supply & Employment

	DKI Jakarta		BOTABEK		JABOTABKE		Indonesia		
	1971	1980	1971	1980	1971	1980	1971	1980	1985
(a) Population	4,546	6,503	3,761	5,413	8,307	11,916	119,208	147,490	164,047
(b) Population aged 10 & over	3,126	4,684	2,448	3,622	5,575	8,305	80,507	104,353	120,380
(c) Labor Force	1,351	2,004	985	1,516	2,336	3,520	41,261	52,421	63,826
(d) Employment	1,179	1,910	762	1,486	1,941	3,396	37,628	51,553	62,457
(e) Rate: (b)/(a)	68.8	72.0	65.1	66.9	67.1	69.7	67.5	70.8	73.4
(f) Labor Force Participation Rate	43.2	42.7	40.2	41.8	41.9	42.2	51.3	50.0	53.0
(g) Employment Rate	87.3	95.3	77.4	98.0	83.1	96.5	91.2	98.3	97.9
(h) Unemployment Rate	12.7	4.7	22.6	2.0	16.9	3.5	8.8	1.7	2.1
	DKI Jakarta		BOTABEK		JABOTABEK		Indonesia		
	1971-80	1980-85	1971-80	1980-85	1971-80	1980-85	1971-80	1980-85	1980-85
	AGR %	AGR %	AGR %	AGR %	AGR %	AGR %	AGR %	AGR %	AGR %
(a) Population	3.97	3.93	4.13	4.09	4.09	2.39	2.15		
(b) Population aged 10 & over	4.60	4.95	4.45	4.53	4.53	2.92	2.90		
(c) Labor Force	4.48	4.85	4.91	4.66	4.66	2.70	4.02		
(d) Employment	5.51	4.63	7.70	6.41	6.41	3.56	3.91		

Source : Population Census in 1971 and 1980, and Intercensus in 1985

Note : (e) = % of Population aged 10 & over to Population
 (f) = % of Labor Force (Economically Active) to Population ; (c)/(a)
 (g) = % of Employed (Working) Persons to Labor Force ; (d)/(c)
 (h) = (1-(d))/(c) x 100
 AGR: Annual Growth Rate

In Jakarta, that workers at informal sector in Jakarta share 29.9% of total employments/ workers in 1980, increased from a 26.7 % share in 1971; in addition, workers at informal sector include "self-employed" and "family worker".

The employment occupations by industrial sectors are: (a) in the nation-wide, primary sector still shared still more than half of the total in 1985 in spite of slow decent; (b) in Jakarta, contrasted with the country's average, the tertiary sector reached at a 74 % share, the secondary sector at 24% and the primary sector at 1% only, as shown in Table 2.2.2.2:

Table 2.2.2.2 Industrial Composition of Employment (1971 - 1985)

DKI JAKARTA	1971		1980		1985	
Primary Sector	42,035	3.57%	36,922	1.92%	20,519	.86%
Secondary Sector	206,988	17.56%	438,829	22.77%	582,777	24.33%
Tertiary Sector	929,992	78.88%	1,451,883	75.32%	1,792,141	74.81%
Total Employed	1,179,015	100.00%	1,927,634	100.00%	2,395,437	100.00%
WEST JAVA	1971		1980		1985	
Primary Sector	3,490,056	61.06%	4,062,242	47.79%	4,889,178	46.76%
Secondary Sector	569,854	9.97%	1,325,273	15.59%	1,621,922	15.51%
Tertiary Sector	1,655,590	28.97%	3,113,428	36.62%	3,944,391	37.73%
Total Employed	5,715,500	100.00%	8,500,943	100.00%	10,455,491	100.00%
INDONESIA	1971		1980		1985	
Primary Sector	24,936,349	66.27%	28,834,041	55.93%	34,141,809	54.66%
Secondary Sector	3,327,449	8.84%	6,790,539	13.17%	8,376,723	13.41%
Tertiary Sector	9,363,858	24.89%	15,928,542	30.90%	19,938,606	31.92%
Total Employed	37,627,656	100.00%	51,553,122	100.00%	62,457,138	100.00%

Source: HASIL SENSUS PENDUDUK 1971, 1980
HASIL SURVEI PENDUDUK ANTER SENSUS 1985

Study team estimated the employment in Jakarta for 1985 at 2.74 million and in Jabotabek at 5.18 million.

In addition, data on the distribution of employments at working places are limited although the spatial distribution pattern on it is an important factor to originate/destinate person-trips. "Sensus Ekonomi (Economic Census) DKI Jakarta" reveals the number of employments working within each

Kecamatan but handles employments at established working places. The present frame of employments at working place in Jakarta (in 1985) as estimated by the almost same method adopted by ARSDS.

2-2-3 Economic Basis

(1) Economic growth

Indonesia's Gross Domestic Product (GDP) went up at an annual rate of 8.1% during the 1970's; but in the early 80's, an annual growth rate of GDP declined at 5.0% due to a sharp drop of oil price in the international market. Against the country's circumstances, Jakarta and Botabek retained a high economic growth of about 10% per a year, as shown in Table 2.2.3.1 and 2.2.3.2.

Jakarta shares a 12.4 % of the GDP in 1985 although it occupies only a 4.8% of the country's population; as a result, per capita GRDP of Jakarta in 1985 reached at Rp. 386,000 (in 1975 constant price) or a 2.6 times of the country's average.

Table 2.2.3.1 Trends of GRDP Growth Rate & Per Capita in Indonesia & Jabotabek (1971 - 1984)

Particulars	DKI JAKARTA			INDONESIA		
	1971 - 1980 - 1984			1971 - 1980 - 1984		
(1) G(R)DP (Billion Rp. at 1984 prices)	2,517	6,136	9,043	35,025	70,601	85,914
- Growth Rate (% p.a.)	(7.2)	(8.7)	(10.5)	(100.0)	(100.0)	(100.0)
	10.4	10.2		8.1	5.0	
(2) Per Capita G(R)DP (Thousand Rp. at 1984 prices)	554	944	1,226	294	479	532
- Growth Rate (% p.a.)	(188.4)	(197.1)	(230.5)	(100.0)	(100.0)	(100.0)
	6.1	6.8		5.6	2.7	

Source: Regional Income of Jakarta, 1969-1975, 1980-1984, Kantor Statistik Jakarta
: Statistical Yearbook of Indonesia, 1975-1985, Biro Pusat Statistik (BPS)

Table 2.2.3.2 GRDP & per Capita GRDP by Region (1979 - 1985)

UNIT : Rp. Billion, 1975 Constant Price

REGION	1979		1980		1981		1982	
SUMATRA	4,813	29.2%	5,130	28.5%	5,371	27.4%	5,531	27.0%
JAVA	8,275	50.3%	9,277	51.5%	10,404	53.1%	11,044	54.0%
DKI JAKARTA	1,527	9.3%	1,668	9.3%	1,950	10.0%	2,222	10.9%
WEST JAVA	2,365	14.4%	2,634	14.6%	2,934	15.0%	3,109	15.2%
OTHER PROVINCES	4,383	26.6%	4,974	27.6%	5,520	28.2%	5,713	27.9%
OTHER ISLANDS	3,373	20.5%	3,610	20.0%	3,809	19.5%	3,892	19.0%
INDONESIA	16,461	100.0%	18,017	100.0%	19,584	100.0%	20,467	100.0%

REGION	1983		1984		1985	
SUMATRA	5,642	25.8%	5,916	24.7%	*	(*)
JAVA	11,969	54.7%	13,101	54.7%	13,739	56.1%
DKI JAKARTA	2,541	11.6%	2,916	12.2%	3,039	12.4%
WEST JAVA	3,265	14.9%	3,654	15.3%	3,878	15.8%
OTHER PROVINCES	6,163	28.2%	6,531	27.3%	6,822	27.9%
OTHER ISLANDS	4,282	19.6%	4,937	20.6%	*	(*)
INDONESIA	21,893	100.0%	23,954	100.0%	24,496	100.0%

ANNUAL GROWTH RATE

REGION	1979/1980	1980/1981	1981/1982	1982/1983	1983/1984	1984/1985	1979/1985
SUMATRA	6.6%	4.7%	3.0%	2.0%	4.9%	*	*
JAVA	12.1%	12.2%	6.1%	8.4%	9.5%	4.9%	8.8%
DKI JAKARTA	93.0%	16.9%	14.0%	14.3%	14.8%	4.2%	12.2%
WEST JAVA	11.4%	11.4%	6.0%	5.0%	11.9%	6.1%	8.6%
OTHER PROVINCE	13.5%	11.0%	3.5%	7.9%	6.0%	4.5%	7.7%
OTHER ISLANDS	7.0%	5.5%	2.2%	10.0%	15.3%	*	*
INDONESIA	9.5%	8.7%	4.5%	7.0%	9.4%	230.0%	6.8%

Note : * DATA NOT AVAILABLE

Source : PENDAPATAN REGIONAL PROVINSI-PROVINSI DI INDONESIA 1979-1984
 STATISTIK INDONESIA 1987
 PENDAPATAN JAKARTA 1983-1986
 PDRB JAWA BARAT 1983-1986
 PDRB JAWA TENGAH 1983-1986
 PDRB YOGYAKARTA 1983-1986
 PDRB JAWA TIMUR 1980-1985

(2) Economic structure in GDP/GRDP

The country's economic structure in GDP is composed of the Agriculture sector (24.9%), Mining and Quarrying (17.7%), Trading (15.6%) and others in 1984.

On the other hand, DKI Jakarta's economic structure is primarily composed of Trading sector (22.9%), Banking (17.8%) and Manufacturing (17.7%).

Industrial sectors concentrated predominantly into Jakarta are: Banking sector (82%), Electricity, Gas and Water sector (35.7%) and Transportation sector (20.3%). These are included into Tertiary Sector; it implies Jakarta's characteristics as a national growth center.

2-2-4 Income

The data on the income groups in Indonesia is not available; but the household expenditure data is obtained from the National Social Economic Survey (SUSENAS) of 1984.

Average per capita monthly expenditure in DKI Jakarta, in the urban area and in the whole country are shown in Table 2.2.4.1.

- The average monthly expenditure in DKI Jakarta was estimated at Rp. 33,354 (in 1984); but more than 60% of citizens were below this average. A group with Rp. 20,000 - 29,999 that shared 32% was the most dominant group.
- The monthly expenditure distribution pattern in urban areas of the country shifted downward slightly; but the one of the whole country shifted outstandingly low-level.

Table 2.2.4.1 Population Distribution by Expenditure Level in DKI Jakarta, 1984

Classes of per Capita Monthly Expenditure (Rp)	Estimated Population	Accumulated % of Population	Average Expenditure (Rp)	Accumulated % of Total Exp.
6,000 - 7,999	10,672	0.15	6,970	0.03
8,000 - 9,999	18,676	0.41	9,214	0.10
10,000 - 14,999	578,289	8.32	12,971	3.17
15,000 - 19,999	1,264,632	25.61	17,602	12.30
20,000 - 29,999	2,354,510	57.80	24,736	36.18
30,000 - 39,999	1,307,987	75.68	34,641	54.75
40,000 - 59,999	1,085,209	90.52	48,038	76.12
60,000 - 79,999	413,540	96.17	67,442	87.55
80,000 -	280,140	100.00	108,375	100.00
Total	7,313,655	100.00	33,354	100.00

Source: Pengeluaran Untuk Konsumsi Penduduk Indonesia Per Propinsi 1984, BPS

2-3: Review of Current Regional and Urban Development Policies and Strategies

2-3-1 Current National Development Plan

-- Fifth Five-Year National Development Plan (REPELITA V) --

(1) National development objective and policy

Fifth Five-Year National Development Plan (REPELITA V) that was commenced April 1 1989 is the current national development policy for 1989/90 - 1993/94. The targets and macro frames are:

1) Long Term Perspective

REPELITA V is the closing stage of the nation's continued implementation in the first 25-year Long Term Development; at the same time it is the stepping board of the preparations to enter the take-off process which will be started as of PELITA VI, as the second 25-year Long Term Development.

2) Two Targets, 1989/90 - 1993/94

The two targets are: (a) to raise the living standard, enlighten the mind and improve the well-being of the whole of the people more evenly and equitability; and (b) to lay a solid foundation of subsequent development stage.

3) Macro Socio-economic Prospects, 1989/90 - 1993/94

The Indonesia's population growth rate is expected to drop from 2.1% in the final year of REPELITA IV to 1.8% in last year of REPELITA V, so that the average annual population growth rate in the five years of REPELITA V will be 1.9%. On the other hand, Indonesia's economic growth in GDP is likely equal to the 5-percentage annual growth rate set in last five years. As a result, GDP per Capita will gain slightly.

In spite of gradual slow down in population growth, Indonesia's labor force in 1989/90 - 1993/94 will increase 11.9 million to 86.4 million people. Providing the employment opportunity for 11.9 million new job-seekers is an important problems of REPELITA V.

(2) Regional development policies and strategies for Jabotabek

Against the current development trend that huge economic activities have been attracted into Jakarta due to the Jakarta's economic gravity, REPELITA V states a key development concept for Jabotabek that future development activities attracted into Jakarta should be integrated with developing Botabek Area, and also shows the development strategies as follows:

- to control the population growth within DKI Jakarta and to encourage the population growth within Botabek,
- to strengthen the economic activities and expand the employment opportunities within Jabotabek,
- to improve quality of human resources and social order,
- to develop the urban infrastructure and improve the urban environmental conditions.

2-3-2 Regional/Urban Development Plans within Jabotabek

(1) Planning system for Jabotabek

1) Long-range regional development plan

-- "Jabotabek Metropolitan Development Plan 2003" and "Jabotabek Development Plan 2005" --

As a Long-range integrated regional development plan for Jabotabek Metropolitan Area, the Indonesia Government prepared "Jabotabek Metropolitan Development Plan 2003" (hereinafter called JMDF) in 1980, in conjunction with the Province Governments of DKI Jakarta

and West Java; and approved it in 1983. This plan formulated the long-range development strategies of the Jabotabek's spatial planning that DKI Jakarta's Structure Plan and other local authorities' Structure Plans are based on after 1984.

BKSP (Development Coordinating Bureau) for Jabotabek and Cipta Karya (Human Settlement) Directorate General reviewed it and prepared the "Jabotabek Development Plan 2005 (Draft)" (= "Konsep Rencana Umum Tata Ruang Wilayah Jabotabek"). Based on the above-mentioned spatial planning strategies, it projected the regional population framework for 2005 and the land use plan considering development actions after 1980. It has not yet approved as the review of JMPP but it has worked as a governmental guideline for coordinating the plan-making of local authorities' Structure Plans and actual development projects.

2) Long-range urban development plans

-- Local Planning Authorities' Structure Plans --

According to Home Affair Minister's Regulation, hierarchy of urban development plans of local planning authority is:

- a) Pola Dasar (Long-range Development Strategy)
- b) 20 Years Structure Plan (1:20,000)
- c) District Plan (1:5,000)
- d) Detailed Plan (1:1,000), etc.

First three plans are legalized by Home Affair Minister.

DKI Jakarta and other local governments in BOTABEK have prepared or are preparing the master plans in harmony with the Government's policy. The local plans prepared or under planning are:

- DKI Jakarta Master Plan: "DKI Jakarta Structure Plan 2005" (1984) and its "District Plans for 30 Kecamatan" (1987); in addition, these were legalized already.

- "Long-Term Development Strategy (Pola Dasar)" for Three Kabupatans (Draft, 1988)
- Structure Plans for suburban towns; Tangerang, Serpong, Depok, Cibinong etc. (1986 - 1988)

In addition, the planning history and relationship are shown in Fig. 2.3.2.1.

(2) Long-range development strategies for spatial planning

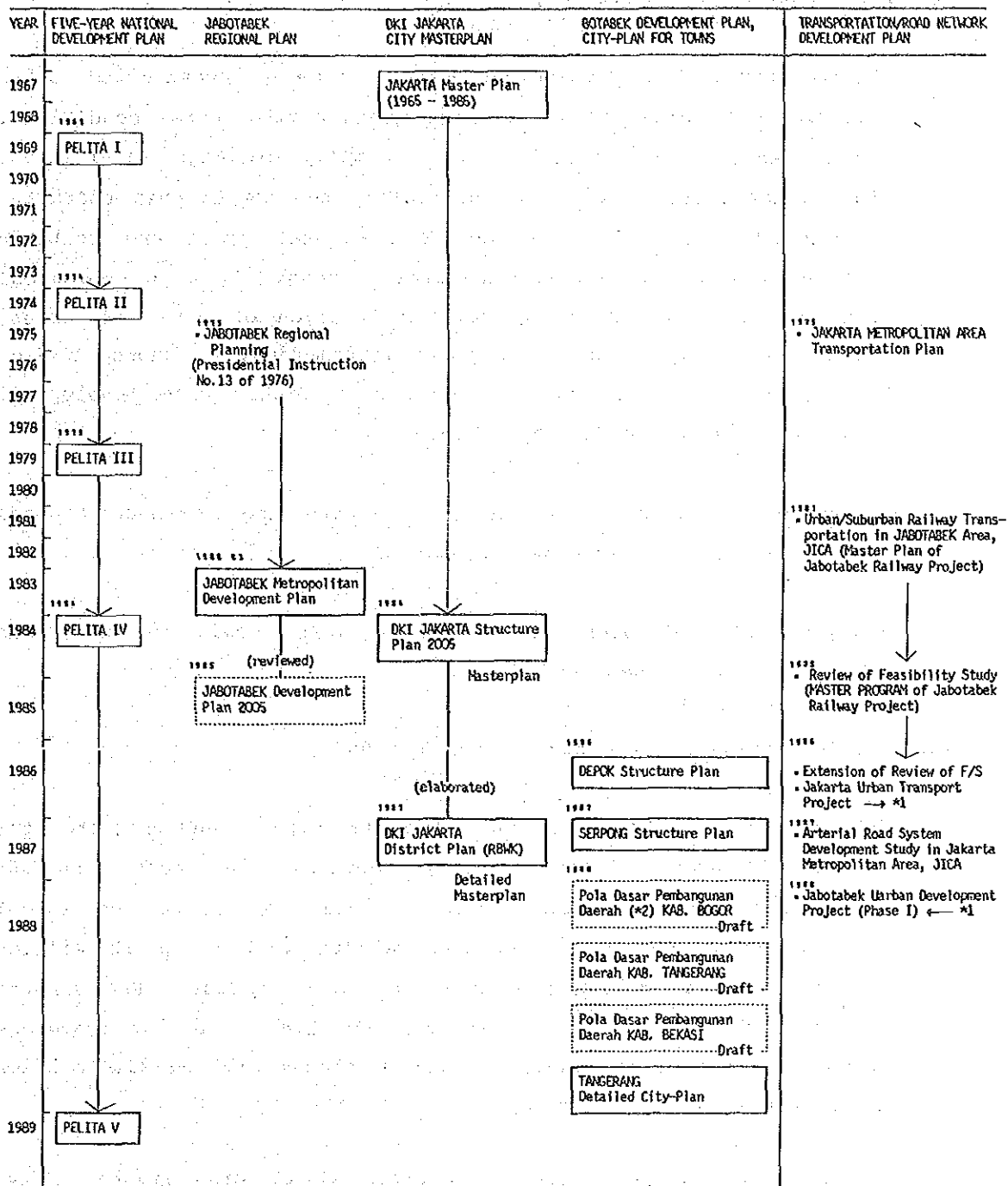
JMDP (1980 - 83) recommend the primary development strategies on spatial planning concepts: (a) Distributive Development Strategy; and (b) East-West Expansion Strategy. These are formulated based on the environmental characteristics of Jabotabek, in particular on water systems of river and ground water, as mentioned later.

The above-mentioned spatial strategies have been taken over by DKI Jakarta Structure Plan (1984), the Jabotabek Development Plan (1985) and other Structure Plans of suburban towns.

1) Distributive development strategy

Due to huge potential to concentrate wealth, capital and population into Jakarta extremely, Greater Jakarta was expected to grow up from 6.6 million to 16 - 18 million by 2003. JMDP recommended a Distributive Development Strategy that not only housing developments but also governmental, educational and other urban functions should be dispersed outside Central Jakarta. The spatial planning concepts are:

- DKI Jakarta should be reformed from a single-core urban structure to a multi-core structure;
- BOTABEK should be developed not only to be commuter towns for Jakarta but also to have self-sustainable centers for BOTABEK.



Note: Current Masterplan; Revised Masterplan; Masterplan not yet approved

*1 The phase 1 of this project, sponsored by the World Bank, has taken over the Jakarta Urban Transport Project (1986).
*2 Long-Range Development Strategy

Fig. 2.3.2.1 Planning History of Jabotabek

2) East-west expansion strategy

At the time, the development trend, namely uncontrolled urban expansion was worsening already the urban environmental conditions, for instance in the portable water supply, drainage, sanitation, flood control and so on. In particular, the topographic character of JABOTABEK identified the northern coastal plain and southern hilly area as environmentally sensitive areas. From an ecological point of view, in particular for conservation of water resources, the East-west expansion strategy was recommended, as shown in Fig. 2.3.2.2; it also is a spatial direction for Distributive Development Strategy. The spatial concepts are:

- Developments within southern hilly areas and northern coastal plains should be restrained strongly.
- Major parts of future development actions should be introduced into eastern and western suburbs.

(3) Current regional development frame for 2005

JMDP's population frame for 2003 also was reviewed and projected for 2005 by DKI Jakarta Structure Plan, Jabotabek Development Plan 2005 (1985) and other Structure Plan or Pola Dasar. In the latest regional frame for 2005, (a) DKI Jakarta will be a 12 million population by a average annual growth rate of 2.48% (DKI Jakarta Structure Plan 2005); (b) Botabek will be 11.4 million by a average annual growth rate of 3.06%; and (c) Jabotabek will be 23.4 million by an annual rate of 2.74%.

In 1984, DKI Jakarta revised the first master plan (1965 - 1985) completely and prepared the new master plan for up to 2005 coordinating with the JMDP's development strategies. Population of 12 million is regarded as the planning target for 2005 due to (a) the implementation program for necessary urban facilities; and (b) the urban environmental capacity.

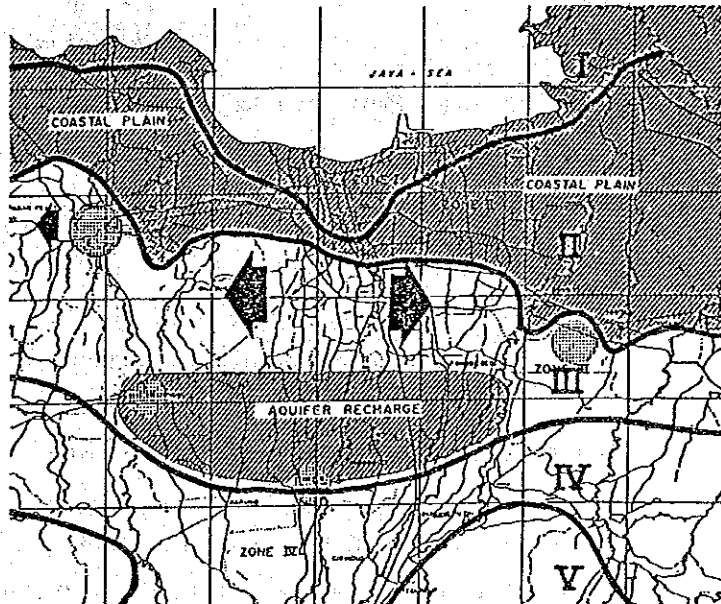
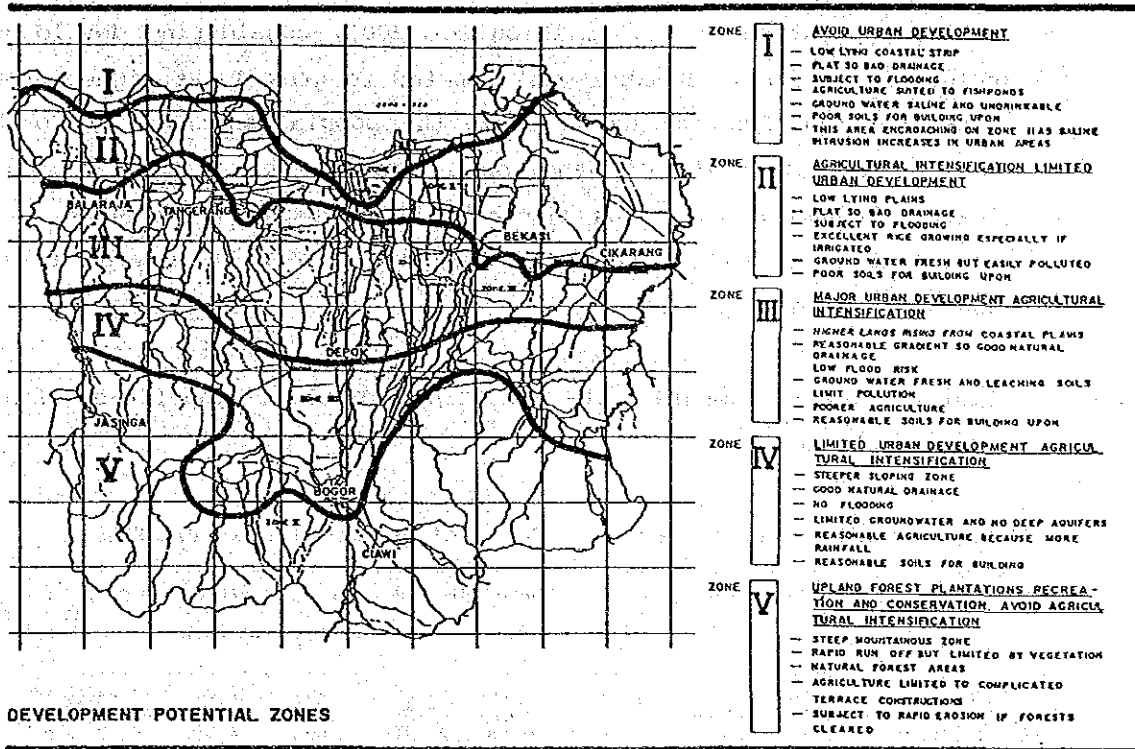


Fig. 2.3.2.2 Regional Development Strategy Established by JMDP

In 1985, Cipta Karya and BKSP Jabotabek projected the Botabek's future population at 11.5 million for 2005, considering development trends in Botabek. Botabek was expected to grow up at higher growth rate than DKI Jakarta; as a result the population share of Botabek would reach at a 49% of Jabotabek. Furthermore in the sub-region level, Kabupaten Tangerang and Bekasi is estimated to grow at an annual rate of 3.63 or 3.79% but Kab/Kdy Bogor will grow at a lower annual rate, namely 2.32%.

Table 2.3.2.1 compares the existing regional population frames above-mentioned.

Table 2.3.2.1 Future Regional Frame of Population in JABOTABEK (x 1000)

	Census Population		1985 *1	Target of JMDP for 2003			Projection of JDP for 2005			
	1980			Population	Annual Growth Rate *2	Population	Annual Growth Rate *3	*4		
DKI JAKARTA	6,503	54.6%	7,885	11,315	54.4%	2.44%	12,000	51.2%	2.48%	2.12%
BOTABEK	5,413	45.4%	-	9,475	45.6%	2.46%	11,439	48.8%	3.04%	-
- Kab/Kdy.BOGOR	2,741	23.0%	-	4,398	21.2%	2.08%	4,515	19.3%	2.02%	-
- KaB.TANGERANG	1,529	12.8%	-	2,819	13.6%	2.70%	4,154	17.7%	4.08%	-
- KaB.BEKASI	1,143	9.6%	-	2,258	10.9%	3.00%	2,770	11.8%	3.60%	-
JABOTABEK	11,916	100.0%	-	20,790	100.0%	2.45%	23,439	100.0%	2.74%	-

Note : *1 Intercensus
*2 (1980 - 2003); *3 (1980 - 2005); *4 (1985 - 2005)

(4) Current sub-region development strategies and local-level implementation for 2005

1) Jakarta's urban development strategies

Jakarta's socio-economic strategies are:

- Population should be controlled not over 12 million by 2005 due to the urban environmental or urban structure's capacity of Jakarta.
- Yearly population increase should be controlled within 260,000 persons from a viewpoint of providing or developing necessary urban facilities.

Jakarta's Spatial Planning Strategies also are based on the Jabotabek's regional strategies proposed by JMDP, as follows:

- Population dispersion should be accompanied with distribution of working places.
- Social services should be promoted; citizen's traffic costs should be minimized; and low-income group, such as a monthly income of less than Rp. 55,000, should be reduced into 24.5% by 2005.
- Environmental aggravation should be minimized; the using underground water in the northern area should be restricted and the water source in the southern area should be conserved.
- Future urban development should be introduced into the east and west directions; the development actions in the southern area should be controlled.
- Development policy of BOTABEK should be integrated to the DKI's policy.

Population distribution concepts up to 2005 are:

- Active areas in population increase are the east or west suburban areas of Jakarta, in particular, the development units of West, North East and North West; these areas are estimated to continue the long-range rapid increase of population by more than 4% of annual growth rate.
- Development unit of North is expected to be level off next two decades.

Distribution concepts for employments at working places are:

- The development units of North and Center would grow up gradually in next two decades and share about a half of total working places due to the existing high concentration.

- But the East and West Units are expected to grow rapidly and to share about 30% of total.

Future urban structure and land use plan up to 2005 are shown in Fig. 2.3.2.3. Based on the distributive development strategy, a multi-core structure is emphasized and eight primary centers will be developed, as follows:

- Kota-Grogol, the existing activity center, will be restricted and other seven Primary Centers for trade and service will be developed.

The industrial development policy also emphasizes a East and West developments, as follows:

- Large and medium industries with environmental pollution should be located/relocated at the downstream of Jakarta, such as Purogagung (East) and Rawabuaya (West).
- Small/home industries can be dispersed into the anywhere neighboring residential areas, taking into account of environmental influence.

For local level implementation of development strategies, Kecamatan-level district Plans, called RBWK, has been prepared in 1987; RBWK controls future land use at block-level and reserve right-of-way of road and other public facilities.

Because the urban impacts of rail-based commuter service in future were not yet identified at the time, station-front-plaza has not yet been planned except a few stations, such as Tanah Abang Station.

DKI JAKARTA
STRUCTURE PLAN 2005

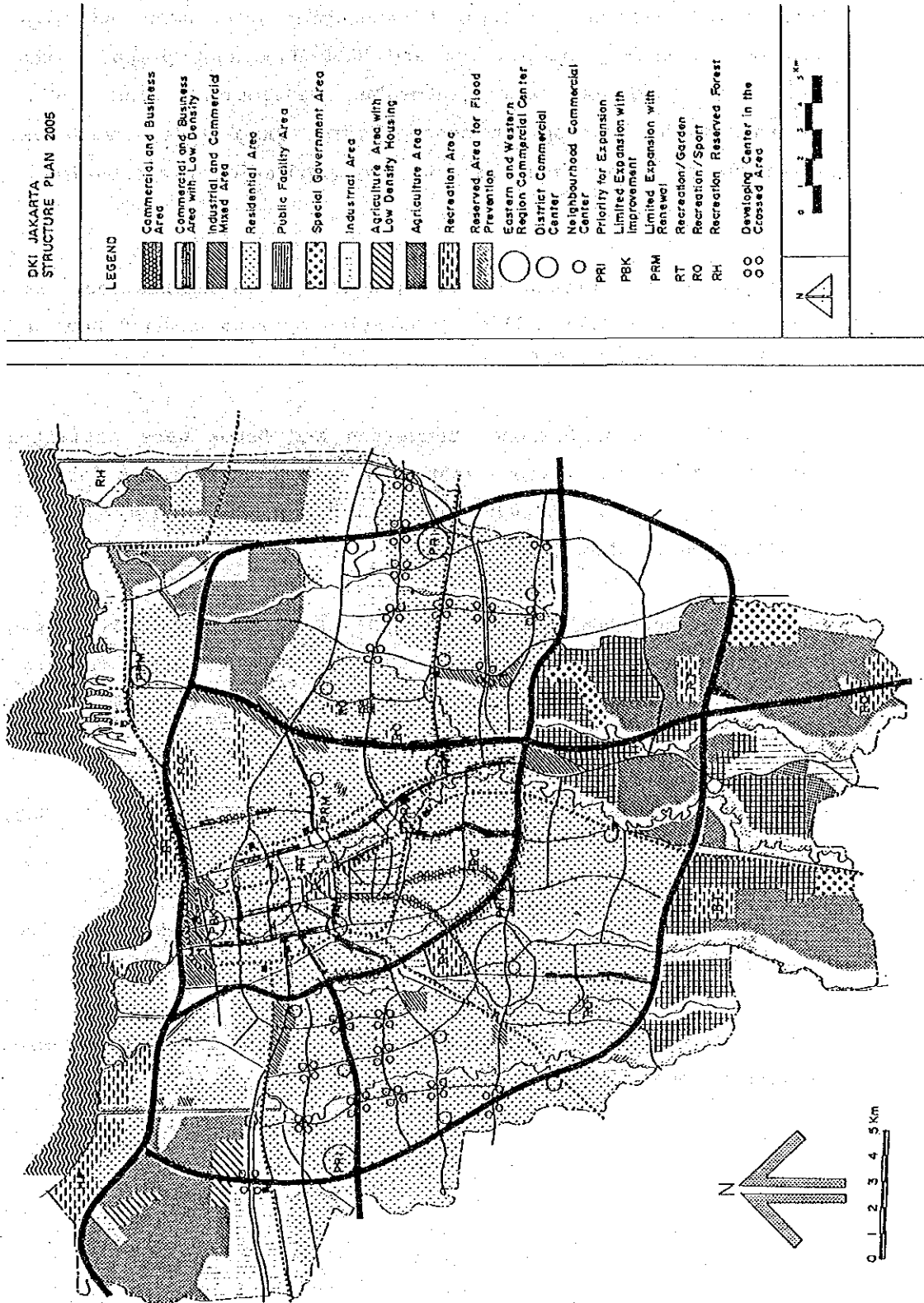


Fig. 2.3.2.3 DKI Jakarta Structure Plan 2005

2) Botabek's urban development strategies in local-level

Accompanied with the development tendencies after JMDP and projected development frame, Cipta Karya and BKSP Jabotabek prepared the new long-range land use plan (Jabotabek Development Plan 2005) and rearranged the development concepts for local level, such as the hierarchy of growth centers and the population distribution. The points revised are:

- The population growth of Kab.Tangerang was emphasized; it was estimated at a 3.73 million population by 2005 changed from a 2.82 million of JMDP by 2003.
- Among the towns, Serpong, Tangerang and Depok were estimated at enough larger populations than JMDP did; in particular Serpong was estimated at a 800,000 population by 2005 from a 135,000 population of JMDP (2003).

After Jabotabek Development Plan 2005, Structure Plans for suburban towns and Long-term Development Strategy (Pola Dasar), draft, for each Kabupaten altered several towns population targets (2005), as follows:

- Serpong will be a 650,000 population in 2005 revised a 800,000 population.
- Bekasi will be a 750,000 population for 2005 revised a 500,000 population.

Table 2.3.2.2 shows the comparison of former and current frameworks above-mentioned.

Table 2.3.2.2 Urban Population Distribution and Settlement Hierarchy in BOTABEK

Locality	JABOTABEK Metropolitan Development Plan 2003		JABOTABEK DEVELOPMENT PLAN 2005		CURRENT LOCAL PLANS *1
	Classifications	Population	Classification	Population	Population
Kdya.Bogor	Main Regional Center	800,000	Primary Development Center	1,000,000	1,000,000
Depok	Main Sub-Center	250,000	Primary Development-Center	400,000	400,000
Cibinong	Secondary Sub-Center	50,000	Primary Development-Center	200,000	200,000
Leuwiliang	Secondary Sub-Center	50,000	Secondary Development Center	150,000	100,000
Jasinga	Secondary Sub-Center	50,000	Secondary Development Center	75,000	100,000
Parung	Secondary Sub-Center	50,000	Secondary Development Center	100,000	100,000
Jonggol	Rural Center	25,000	Secondary Development Center	75,000	100,000
Cileungsi	Secondary Sub-Center	75,000	Secondary Development Center	200,000	200,000
Parung Panjang	-	-	Secondary Development Center	75,000	100,000
Cimanggis	Secondary Sub-Center	50,000	-	-	-
Citeureup	Secondary Sub-Center	75,000	-	-	-
Cibungbulan	Secondary Sub-Center	50,000	-	-	-
Ciampea	Rural Center	25,000	-	-	-
Ciawi	Rural Center	25,000	-	-	-
Other Rural Centers Villages	Small Rural Centers	553,000	Tertiary Development Centers Villages	630,000	-
		2,270,000		1,965,000	
Kab/Kdya Bogor		4,398,000		4,870,000	
Tangerang	Main Sub-Center	620,000	Primary Development Center	850,000	850,000
Serpong	Main Sub-Center	135,000	Primary Development Center	700,000	700,000
Balaraja	Secondary Sub-Center	100,000	Secondary Development Center	100,000	100,000
Cikupa	-	-	Secondary Development Center	100,000	100,000
Pasar Kemis	-	-	Secondary Development Center	60,000	60,000
Ciputat	Secondary Sub-Center	100,000	Secondary Development Center	250,000	250,000
Pondok Aren	-	-	Secondary Development Center	150,000	150,000
Curung	Rural Center	25,000	Secondary Development Center	100,000	100,000
Tigaraksa	Secondary Sub-Center	50,000	-	-	-
Legok	Rural Center	25,000	-	-	-
Small Rural Centers Village Population		174,000	Tertiary Development Centers Villages	360,000	-
		1,590,000		1,060,000	
Kab.Tangerang		2,819,000		3,730,000	
Bekasi	Main Sub-Center	500,000	Primary Development Center	500,000	750,000
Cikarang	Secondary Center	100,000	Primary Development Center	500,000	400,000
Pondok Gede	-	-	Primary Development Center	150,000	200,000
Jatiasih	-	-	Secondary Development Center	100,000	100,000
Bantar Gepang	-	-	Secondary Development Center	100,000	100,000
Tambun	-	-	Secondary Development Center	100,000	200,000
Lemah Abang	Rural Center	25,000	-	-	-
Setu	Rural Center	25,000	-	-	-
Cibitung	Rural Center	25,000	-	-	-
Cibarusa	Rural Center	25,000	-	-	-
Other Rural Centers Village Population		263,000	Tertiary Development Centers Villages	340,000	-
		1,295,000		1,110,000	
Kab.Bekasi		2,258,000		2,900,000	
TOTAL OF BOTABEK		9,475,000		11,500,000	

Note *1 : Pola Dasar (Long-Range Development Strategy) of Kab.Bogor,Tangerang,Bekasi; and Structure Plan of Tangerang, Serpong and Depok.

Current land use plan (Jabotabek Development Plan 2005), working as an administrative guideline, reflects the above-mentioned alteration in population allocation and current development trends, as follows (see, Fig. 2.3.2.4):

- Tangerang-Serpong development areas are expanded largely; it is emphasized that the two towns will be the regional and sub-regional centers. The spatial development patterns are in harmony with the structure plans of the two towns.

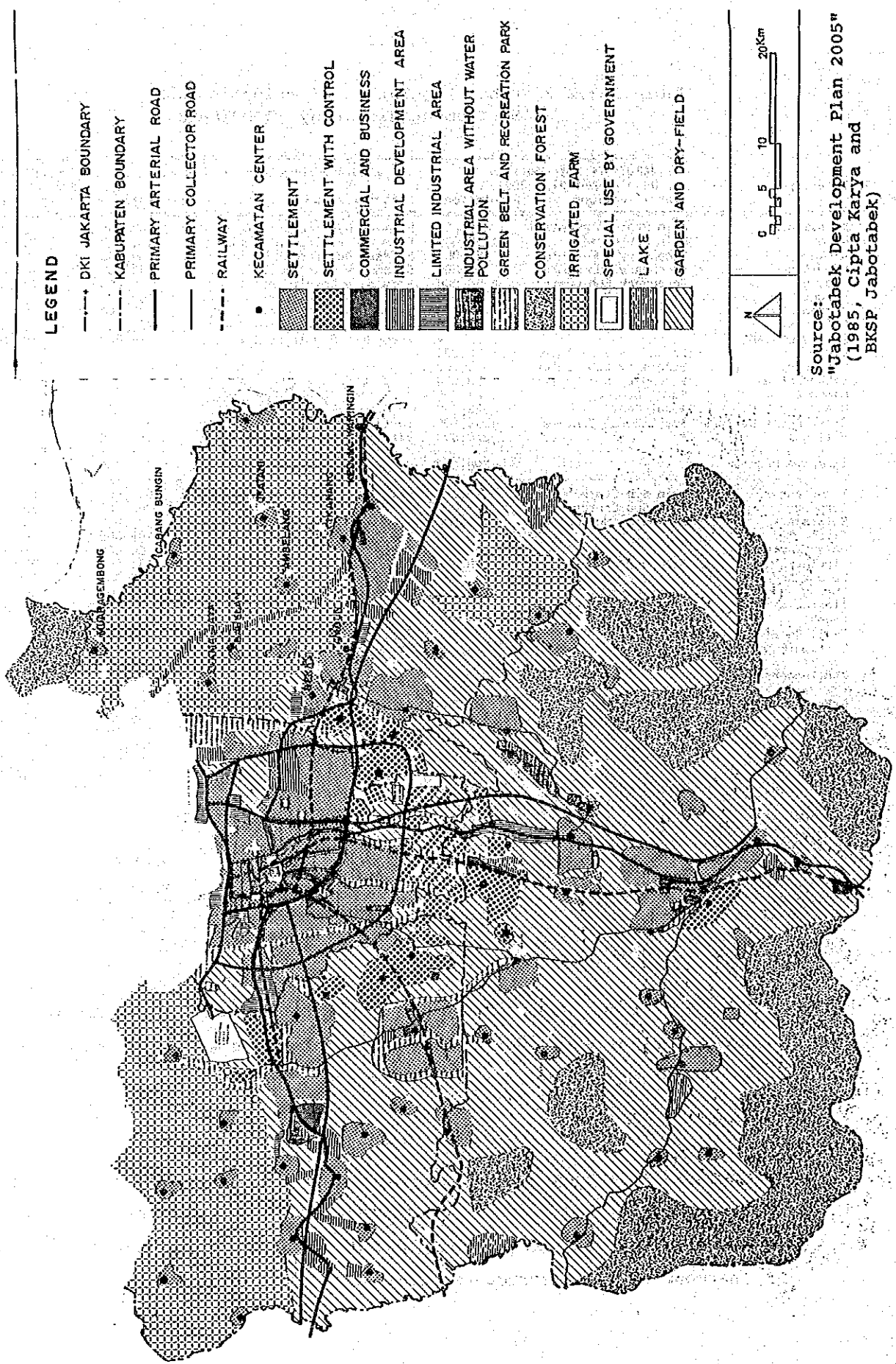


Fig. 2.3.2.4 JABOTABEK Region Structure Plan 2005

- The spatial development patterns of Depok and Bekasi also are coordinated the local plans.

Furthermore based on the Distributive Development Strategy, a part of public facilities concentrated into the central Jakarta are/will be relocated into BOTABEK; for example the University of Indonesia was relocated into the northern Bogor, existing/new manufacturing industries into Bekasi and Tangerang areas, and new institution will be introduced into Serpong area, and so on.

2-3-3 Urban Pattern and Railway Corridor

Current structure plans and other urban development plans above-mentioned considered the future railway improvement conceptually not concretely.

DKI Jakarta Structure Plan 2005 shows:

- Seven of eight primary centers, such as Kota-Grogol, Jatinegara, Tanah Abang, Tanjung Priok, Pasar Senen, Manggarai and East Primary Center, are/will be placed around stations. And the governmental center Gambir-Monas area also is located around Gambir Station.
- Other local centers also are/will be around stations, such as Kabayoran, Klender, and so on.

Jabotabek Development Plan 2005 and other local plans shows:

- Regional and sub-regional centers, such as Tangerang, Serpong, Depok and Bekasi, are dispersed within a radius of about 25 - 30 km; these centers are estimated at 400,000 to 850,000 population by 2005.
- The above-mentioned towns will be covered by future rail-based commuter services and will be commutable area of Jakarta by rail-based and/or road-based public transportations;
 - a) Tangerang Line Corridor will include Tangerang (850,000 population in 2005), shared by road-based access.

- b) Serpong Line Corridor will include Serpong (650,000), Ciputat (250,000) and Pondok (150,000), shared road-based access by the free way planned.
- c) Central Line Corridor will include Depok (400,000), and Cibinong (200,000) and Bogor (1,000,000), shared road-based access.
- d) Bekasi Line Corridor will include Bekasi (750,000) and Cikarang (400,000). Shared road-based access.

However the current Structure Plans and other local plans have not yet been coordinated, in district-plan level, with the rail-based commuter service introduction:

- lacking in the arrangement of land use and collector road network around stations
- lacking in the coordination between both implementation programs of the railway projects and urban developments

Because the railway improvement impact is one of the factors for local level planning, the above-mentioned planning issues should be solved by the integrated planning study for the areas.

CHAPTER 3 PRESENT SITUATION OF TRANSPORTATION SYSTEM

Chapter 3 Present Situation of Transportation System

3-1 General Aspect of Transportation Systems

3-1-1 Introduction

This section describes general aspects of transportation systems and characteristics of travel patterns in Jakarta and BOTABEK region, and tries to clarify existing problems and a desirable direction of the transportation systems improvements.

The following sections first introduce the existing condition of transportation infrastructures including railway, highway network and public transportation systems. Section 3-1-3 analyses the nature of transit ridership and modal share by using mainly ARSDS home interview survey conducted in 1986, which is followed by a review of transportation policies in JABOTABEK Area. Specific emphasis was placed on the review of policies relating to the improvement of railway system in JABOTABEK Area.

3-1-2 Transportation Systems

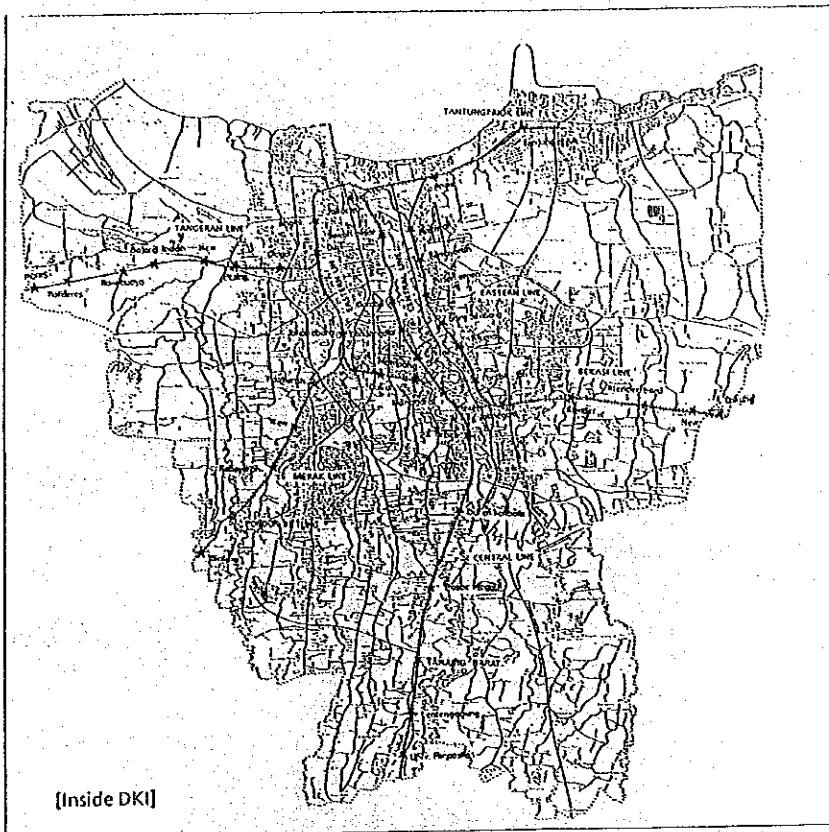
(1) JABOTABEK railway

The major role of railway transportation in Indonesia has been in long distance travel.

Currently, there are seven lines totaling 160 km of rail length and 53 railway stations in JABOTABEK Area. Seven lines are: Eastern-, Central-, Bekasi-, Tanjung Priok-, Serpong-, and Tangerang Lines (Fig. 3.1.2.1) radiating from Jakarta towards South-east (Bekasi Line), South (Central Line), South-west (Serpong Line), West (Tangerang Line) and East (Tanjung Priok Line) and the rest of the lines forming a quasi-loop within the metropolitan area.

Eastern Line, Western Line, Tanjung Priok Line and Central Line (between Jakarta Kota and Depok) have double track but the remaining lines -- Tangerang Line, Serpong Line and Central Line (between Depok and Bogor) have single track limiting the increase of train frequency to meet the expected growth of suburban commuters. Tangerang Line, Serpong Line, Bekasi Line and a part of Central Line (Manggarai - Bogor) has not been electrified.

Urban land use in Jakarta has been developed by reflecting the long-distance-oriented policy of JABOTABEK train and many of the railway stations are neither situated in high-density urban development in the metropolitan area nor in residential development within the suburban area. Major commercial and office development in JABOTABEK region have been taken place along major highways and road network (Fig. 3.1.2.2). This fact in turn limited the size of railway patronage and the growth of rail-feeder services as it will be explained in detail in the later sections.



Legend:

- Railway (outside)
- ★ Station
- DKI boundary

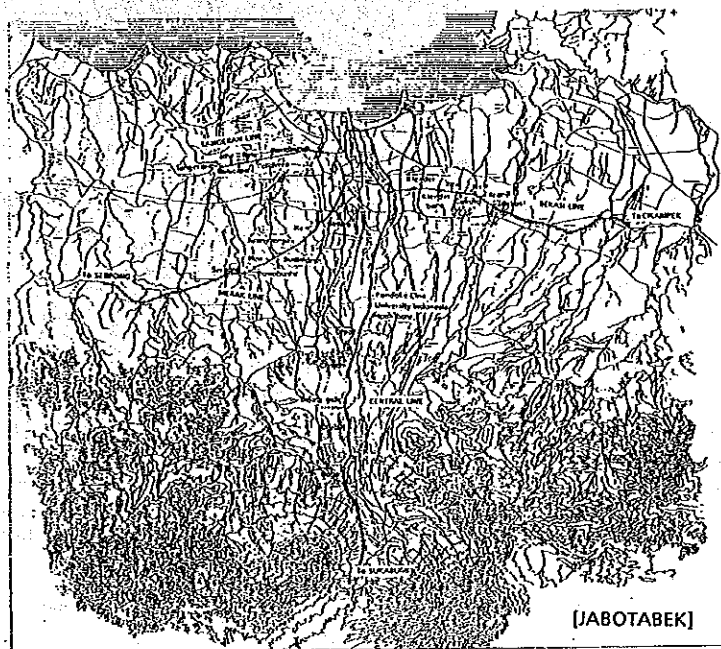


Fig. 3.1.2.1 Existing Railway Network

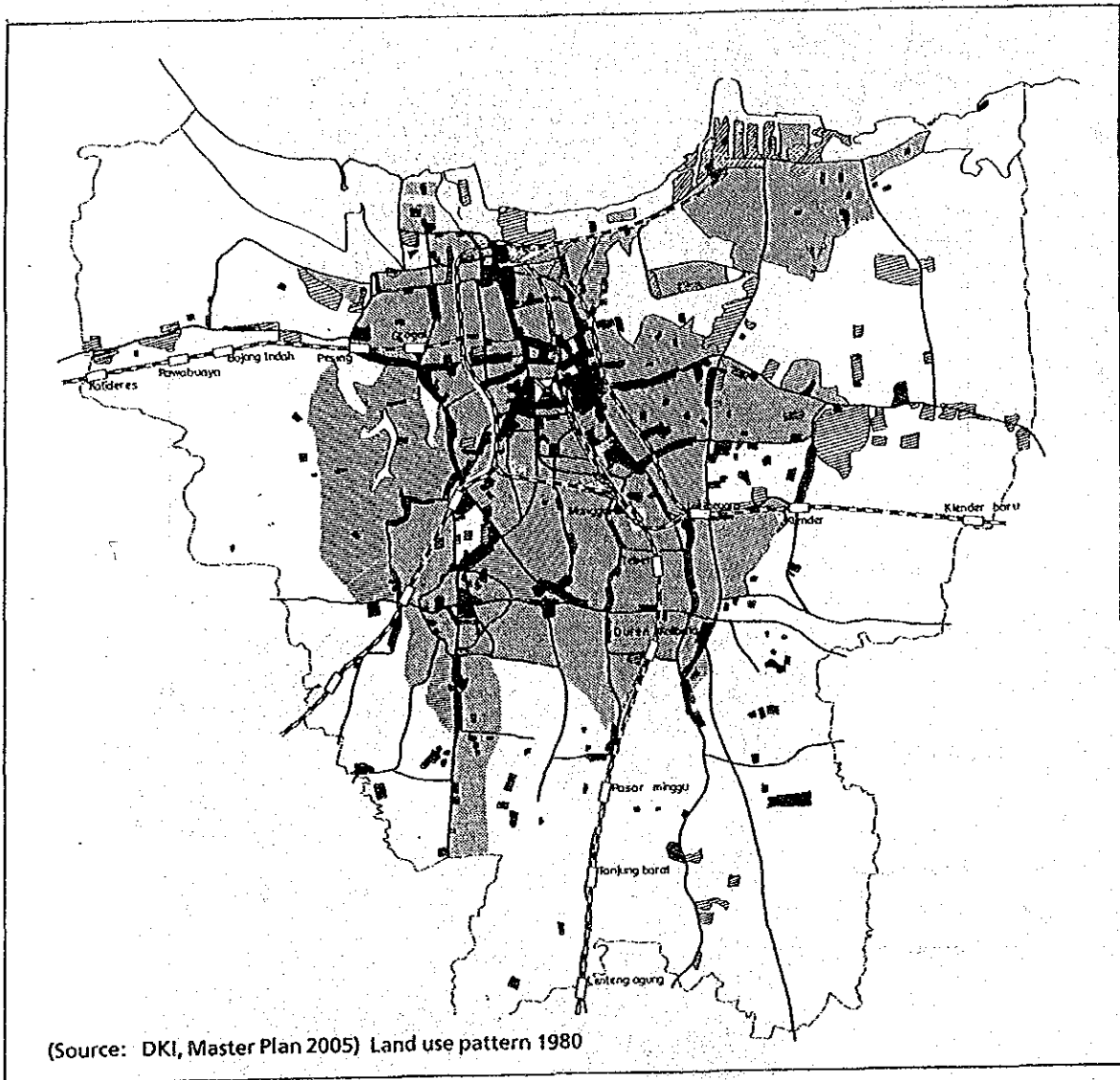


Fig. 3.1.2.2 Urban Land Use Development and Railway Network -
Low Degree of Coordination