

DIRECTORATE GENERAL OF HIGHWAYS
MINISTRY OF PUBLIC WORKS
THE REPUBLIC OF INDONESIA

ARTERIAL ROAD SYSTEM DEVELOPMENT STUDY IN JAKARTA METROPOLITAN AREA

FINAL REPORT
EXECUTIVE SUMMARY


September, 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

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国際協力事業団		
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PREFACE

It is with great pleasure that I present this report entitled the Arterial Road System Development Study in Jakarta Metropolitan Area to the Government of the Republic of Indonesia.

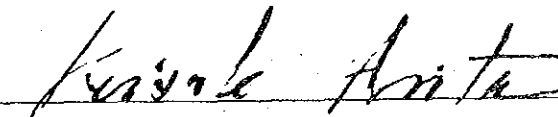
This report embodies the result of a transportation masterplan study which was carried out in the Jakarta Metropolitan Area from November 11, 1984 to July 19, 1987 by a Japanese study team commissioned by the Japan International Cooperation Agency following the request of the Government of Indonesia to the Government of Japan.

The study team headed by Mr. Nobuwaka Yamakawa, Pacific Consultants International Co., Ltd. had a series of close discussions with the officials concerned of the Government of Indonesia and conducted a wide scope of field survey.

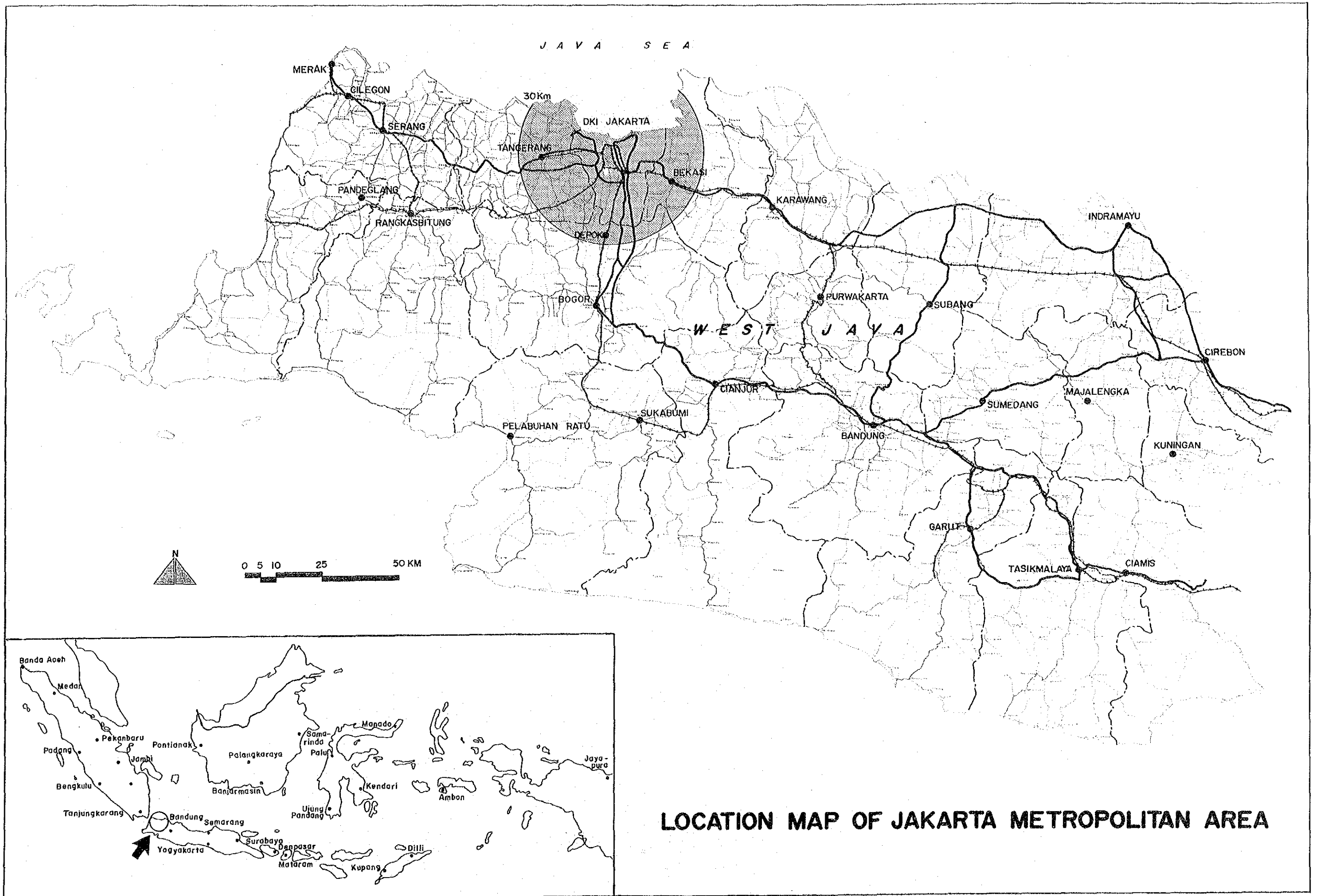
I hope that this report will be useful as a basic reference for the development of the road system.

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

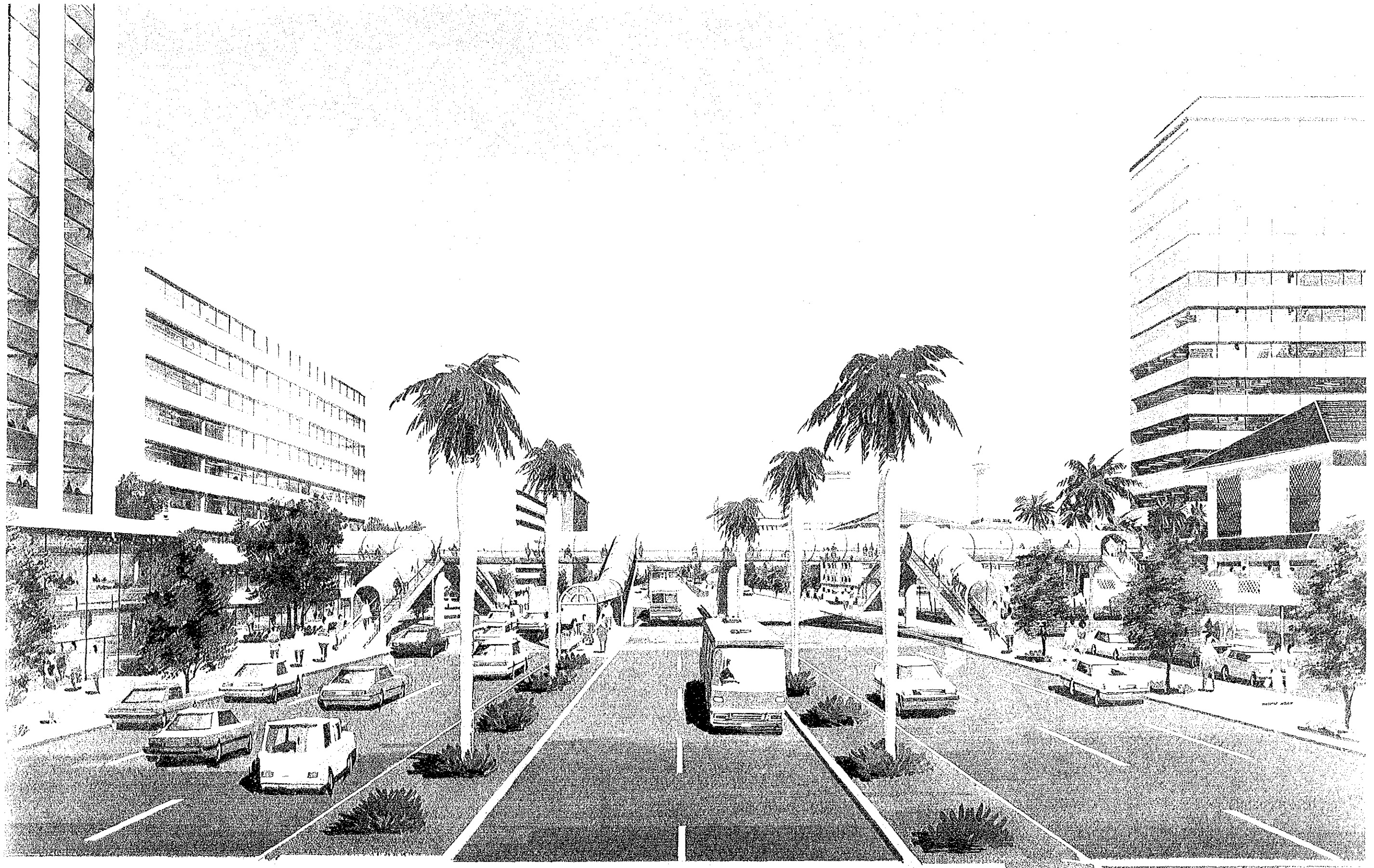
September 1987



Keisuke Arita
President
Japan International Cooperation Agency



LOCATION MAP OF JAKARTA METROPOLITAN AREA



PERSPECTIVE VIEW OF MEDIUM/MASS TRANSPORTATION CORRIDOR
(Joint Right-of-Way of Busway and Arterial Street)

JAKARTA METROPOLITAN AREA

The Jakarta Metropolitan Area that was covered by the Arterial Road System Development Study (ARSDS) is the area within a 30 km radius from Monas. This area includes Jakarta and the four sub-regional centers of Tangerang/Batu Ceper, Bekasi/Tambun, Serpong and Depok.

The Jakarta Metropolitan Area is characterized by remarkable urban growth and the close connection of mutual activities within an area of one day's trip length. In DKI Jakarta, the capital city of Indonesia, and also in the surrounding areas, the concentration of population and economic activities have been increasing, resulting in traffic problems which cannot be solved by only looking at DKI Jakarta. In consideration of inter-regional traffic and intra-regional traffic in the Jakarta Metropolitan Area, the situation makes it necessary to establish a Metropolitan Transportation System.

BACKGROUND

Directions for the Jabotabek Region's long term development have been shaped through the various development planning studies on this region since 1967. Among the other planning studies, the Jabotabek Metropolitan Development Plan (JMDP) played the most crucial role in establishing the existing development objectives. The JMDP study was undertaken in accordance with Presidential Instruction No. 13, 1976, which calls for the related agencies to adjust and coordinate their development planning throughout the Jabotabek Region.

The authorized DKI Jakarta Structure Plan 2005 and the current Jabotabek Development Plan 2005 have been established with some revision in line with the JMDP study. These documents suggest principles to guide regional/urban development and transportation development. The Arterial Road System Development Study in the Jakarta Metropolitan Area (ARSDS) was undertaken in coordination with the existing development objectives and transportation sector guidelines.

On the other hand, the transportation development planning studies on railways, tollways, arterial roads, bus systems, etc., have been independently carried out. Moreover these transportation studies were not well coordinated with the regional and urban development studies.

Short term traffic management and road transport development studies for DKI Jakarta were conducted by the Jakarta Urban Transport Project and other short term projects.

In this context, the Arterial Road System Development Study in the Jakarta Metropolitan Area (ARSDS) was undertaken to prepare a strategic long term arterial road and street system development plan from both a comprehensive transportation planning viewpoint and a regional/urban development viewpoint.

STUDY OBJECTIVES

The Main objective of the ARSDS is to establish an Arterial Road and Street Development Plan and strategies to achieve the existing development objectives by strengthening the existing DKI Structure Plan 2005 and the current Jabotabek Development Plan 2005.

In more specific terms, the objectives of the ARSDS are as follows:

1. To strengthen the traffic and transportation data base for different transportation planning programs by conducting a full scale person trip survey.
2. To establish an arterial road and street network in 2005 in coordination with the preferred urban system in the Jakarta Metropolitan Area by strengthening the existing development plans.
3. To formulate an integrated transportation development strategy to coordinate each transportation system development within an integrated transportation system and to coordinate transportation development with urban development.
4. To formulate an implementation program of the priority projects for arterial road and street development according to the recommended transportation development strategy.
5. To identify other important development projects related to arterial road and street development.

STUDY APPROACH

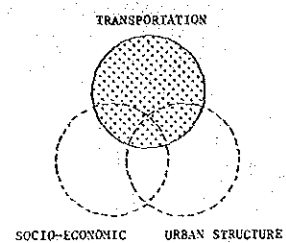
The approach of the ARSDS is characterized by the following four principles.

1. The Study is based on the analyses of the present conditions, not only of transportation but also of socio-economics and urban structure, in the Jakarta Metropolitan Area.
2. The present traffic and transportation analyses are based on the full scale person trip survey 1985, which allows a comprehensive approach to the whole transportation system, in addition to the traffic counting survey, travel speed survey and inventory of transportation facilities.
3. The Study is designed to deal with transportation development within the urban development context, because transportation development cannot be separated from urban development, especially in a metropolitan area where the urban structure is to be changed.
4. The strategies recommended by the ARSDS delineate the measures to be taken in the process by which change is to be achieved. The strategies should be action oriented.

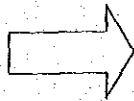
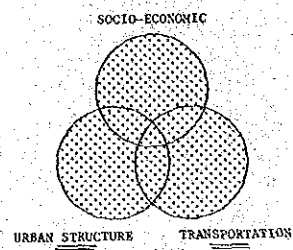
The study approach described above is shown in the following figure.

A. ANALYSIS OF URBAN PROBLEMS

EXISTING TRANSPORTATION PROBLEMS



EXISTING URBAN PROBLEMS



B. REVIEW OF EXISTING DEVELOPMENT PLANS

BASIC DEVELOPMENT CRITERIA

- EQUITABLE DEVELOPMENT
- EFFICIENT DEVELOPMENT
- ENVIRONMENT CONSCIOUS DEVELOPMENT

PRIME DEVELOPMENT POLICY

DECENTRALIZATION OF URBAN SETTLEMENT, ECONOMIC ACTIVITIES AND URBAN FUNCTIONS FROM DKI JAKARTA

MAJOR TRANSPORTATION DEVELOPMENT POLICY

ESTABLISHMENT OF THE MAJOR ROLE OF MASS TRANSPORTATION

NEEDS TO CHANGE URBAN STRUCTURE

- To what kind of urban structure ?
- How to change ?

C. FUTURE PROSPECT AND REGIONAL DEVELOPMENT PATTERN

FUTURE PROSPECTS
DEVELOPMENT POTENTIALS
DEVELOPMENT CONSTRAINTS

SELECTED REGIONAL DEVELOPMENT PATTERN

FORMULATION OF JAKARTA METROPOLITAN AREA

D. PLANNING STUDY

EXISTING URBAN STRUCTURE

- MONOCENTRIC STRUCTURE WITHOUT SUB CENTERS
- GELL SYSTEM (ROAD NETWORK)

STRATEGIC URBAN STRUCTURE

- MULTI NUCLEUS SYSTEM
- MULTI CORRIDOR SYSTEM
- URBAN UNIT SYSTEM

URBAN DEVELOPMENT STRATEGIES

- ACTIVITY CENTER DEVELOPMENT
- ARTERIAL ROAD & STREET DEVELOPMENT
- MASS TRANSPORTATION DEVELOPMENT

E. NETWORK PLANNING

ROAD & STREET NETWORK

- Location
- Function

FORMULATION OF EAST-WEST DEVELOPMENT AXIS

MASS TRANSPORTATION CORRIDOR

F. IMPLEMENTATION PROGRAM

POTENTIAL PROJECTS OF ROADS & STREETS

No. of Lane/Right of Way

FUTURE TRAFFIC DEMAND

BUSWAY AT INITIAL STAGE

IMPLEMENTATION PROGRAM

TRANSPORTATION DEVELOPMENT STRATEGIES

RECOMMENDED ACTIONS IN THE NEXT FIVE YEARS

COMPOSITION OF REPORT

The reports presented in this study are composed of a Executive Summary, Main Report and Supporting Reports.

The Supporting Reports are:

- No. 1 : Socio-Economic and Financial Analyses
- No. 2 : Urban Structure
- No. 3 : Traffic Survey and Analyses
- No. 4 : Transportation Facilities and Analyses
- No. 5 : Future Traffic Demand
- No. 6 : Transportation Policy and Planning

WORK FLOW CHART AND KEY WORD INDEX

RECOMMENDATION

One of the policy solutions for the urban transportation problems of a megalopolis, from an urban planning point of view, is to change the urban structure from one which allows almost all of the traffic to concentrate to one central area, to one which disperses traffic to centers of the multi nucleus pattern. Moreover, another solution reinforcing the solution by the multi nucleus system, is to establish Medium/Mass Transportation Corridors connecting centers so as to convert the urban structure from one which depends on individual transport modes, to one which depends on medium/mass transport modes.

The following are the major recommendations of the ARSDS.

- 1) The east-west urban axis should be established, in addition to the existing strong north-south axis, historically in order to achieve the development objectives.
- 2) A large scale transportation infrastructure is required to establish the east-west urban axis, which would induce the east and west area development.
- 3) The transportation to establish the east-west urban axis should have a high transport speed service, which is relatively competitive to existing transportation systems.
- 4) The transportation to establish the east-west urban axis should be a medium/mass transportation system, in consideration of transport efficiency, energy consumption and air pollution. The axis should be a rapid bus system operated on an exclusive busway at the initial stage, because of the investment efficiency in the east and west growing areas. A joint busway and arterial street right-of-way is suitable to induce development along the corridor. The corridor should be designed to be convertible into another guideway system with a larger transport capacity and higher speed.
- 5) The north-south axis, which is congested with excessive traffic demand, should be undertaken to increase the transportation capacity by examining measures such as a arterial street, tollway, medium/mass transit system.
- 6) The direct access to the existing Central Area from activity centers (including sub-centers and secondary centers) in the suburban areas should be secured to induce development outwards from the Central Area. This is a key to encourage sub centers (East, West, Tangerang and Bekasi) and secondary centers.
- 7) Basic transportation network to form the megalopolis such as Jakarta Metropolitan Area should be provided with the progress of suburban housing development, which should be developed to form an urban unit. The basic network should be a guideline for collector and local streets in Urban Units.

RECOMMENDED ACTIONS IN THE NEXT FIVE-YEAR PERIOD

Based on the ARSDS it is highly recommended that full advantage be taken of the chance to review the existing DKI Structure Plan, which is supposed to be done every five years, in order to strengthen its transportation sector plan and to take following actions without delay in the next five-year period:

- 1) Feasibility Study of the whole medium/mass transportation corridor development program in order to decide the alignment, and to start the development control to secure the right-of-way.
- 2) Feasibility Study on the north-south corridor (Blok-M – Kota) development and parking facility development in the Central Area. The reinforcing facility to be examined are arterial road, tollroad, busway, medium/mass transportation mode, etc.
- 3) Central Area Development Planning Study including activity center development/ redevelopment, parking plan, station plaza plan, traffic management plan, arterial road plan, etc., which are essential for the provision of direct access to the Central Area from activity centers in the sub-urban area.
- 4) Feasibility Study for the present traffic problem oriented program such as existing arterial roads in the Central Area.
- 5) Feasibility Study for the major arterial streets and primary roads in order to establish the multi-nucleus system.
- 6) Budgetary Study of transport sector.

IMPLEMENTATION PROGRAM

The implementation programs recommended in the study are selected from the viewpoint of future urban formation and transportation development strategies. They are classified into 7 programs by program nature and each implementation schedule are shown in the following table.

COST OF PROGRAMS

PROGRAM	ESTIMATED PROJECT COST (x 10 ⁶ Rp)				
	PELITA IV	PELITA V	PELITA VI	PELITA VII	TOTAL
1 Mass Transportation Corridor Development Program	—	159,471	226,352	209,737	595,560
2 Major Arterial Street Development Program	63,342	—	44,827	132,788	240,957
3 Arterial Street Development Program in the Newly Urbanizing Area	113,855	94,486	110,073	—	318,414
4 Present Traffic Problem Oriented Program	37,959	274,307	42,188	—	354,454
5 East–West Connection Improvement Program	—	—	38,363	—	38,363
6 North–South Axis Strengthening Program	—	—	—	40,685	40,685
7 Freeway Development Program	164,500	1,500,589	—	—	1,665,089
Total	215,876 (380,376)	528,264 (2,028,853)	461,803 (461,803)	383,210 (383,210)	1,588,433 (3,253,522)

Note: Figures in () show total costs and without () for those of exclusive freeway

The details of each program are shown by the 5 year development period in the following tables and a figure.

1 PROJECT LIST OF MEDIUM/MASS TRANSPORTATION CORRIDOR DEVELOPMENT PROGRAM

No	Name/Location	No. of Lane	Length (Km)	Implementation Period (Pelita)	Construction Cost (x 10 ⁶ Rp)
A1	Ex-Kemayoran – West Center	6	13.9	V	88,910
A2	Tn. Abang – West Center	6	16.0	V	70,561
A3	West Center – Tangerang Ring	6	30.3	VI	110,571
A4	East Center – Bekasi Ring	6	26.3	VI	115,781
A5	Tangerang South – Tanah Abang	6	19.3	VII	98,464
A6	Bekasi South – Ex-Kemayoran	6	27.0	VII	111,273
Total					595,560

2 PROJECT LIST OF MAJOR ARTERIAL STREET DEVELOPMENT PROGRAM

No	Name/Location	No. of Lane	Length (Km)	Implementation Period (Pelita)	Construction Cost (x 10 ⁶ Rp)
B1	Pesing – Kebayoran Baru	6	9.6	IV	63,342
B2	Tangerang MTC Supplemental Link	4	9.4	VI	21,200
B3	Bekasi MTC Supplemental Link	4	7.1	VI	23,627
B4	Ancol – Cilincing	6	10.3	VII	53,097
B5	Cilincing – Pulo Gadung Lor	4	6.4	VII	23,707
B6	Pondok Gede – Fatmawati	4	15.9	VII	40,659
B7	Blok M – Cilandak	6	5.4	VII	15,325
Total					240,957

3 PROJECT LIST OF ARTERIAL STREET DEVELOPMENT PROGRAM IN THE NEWLY URBANIZING AREA

No	Name/Location	No. of Lane	Length (Km)	Implementation Period (Pelita)	Construction Cost (x 10 ⁶ Rp)
C1	East Center Related Street (Kembangan – Kupuh 1)	4	6.7	IV	9,177
C2	East Center Related Street (Meruya Udik – Rawatiga Suku)	4	3.7	IV	9,867
C3	West Center Related Street (Pulo Gadung – Rawadomba)	4	7.2	IV	25,750
C4	West Center Related Street (Rawa Terate – Ujung Kranjang 1)	4	3.0	IV	33,555
C5	West Center Related Street (Klender – Bojong)	4	5.8	IV	23,289
C6	West Center Related Street (Gedung 2 – Cilungu 2)	4	2.3	IV	12,217
C7	Bugel 1 – Legok	4	6.5	V	12,207
C8	Jakarta – Kampung Kelapa 1	2	7.8	V	10,655
C9	Kontrakan – Donkel 2	2	9.7	V	11,811
C10	Bekasi – Tambun	2	7.0	V	11,151
C11	Rawapajang – Rawa Banteng	2	8.6	V	9,400
C12	Teluk Betung – Ps. Bondo	4	9.9	V	27,351
C13	Tambun – Tambun South	2	4.9	V	11,921
C14	Ciledug – Meruya Udik	2	5.9	VI	16,844
C15	Pondok Aren – Juraganan	2	6.3	VI	13,001
C16	Cipondoh – Cipadu	2	6.3	VI	8,595
C17	Kebaren – Bantenan	2	6.4	VI	8,529
C18	Kali Malang – Kp. Asem	4	7.3	VI	16,412
C19	Malaka 3 – Pondok Meloh	2	8.4	VI	12,695
C20	Kp. Gunung – Kebantenan 1	2	3.0	VI	12,073
C21	Rangklanwsmgin – Pekayon 2	2	7.0	VI	13,941
C22	Pondok Gede – Pondok Bend	2	4.1	VI	7,983
Total					318,424

4 PROJECT LIST OF PRESENT TRAFFIC PROBLEM ORIENTED PROGRAM

No	Name/Location	No. of Lane	Length (Km)	Implementation Period (Pelita)	Construction Cost (x 10 ⁶ Rp)
D1	Pondok Pinang – Pejompongan	4	5.2	IV	8,960
D2	Ragunan – Buncit Raya	6	4.6	IV	2,923
D3	Ps. Minggu – Depok	4-6	20.4	IV	23,291
D4	Kali Malang	4	4.7	IV	2,785
D5	Kota – Jembatan Dua	6	2.3	V	13,642
D6	Ex-Kemayoran – Cikini	4-6	14.6	V	14,988
D7	Pejajaran – Pondok Baru	6	1.6	V	77,446
D8	Rawatingasuku – Tanah Abang	4	5.1	V	34,352
D9	Pejompongan – Karet Kubur	4	1.7	V	5,489
D10	Blok M – Kota	8	13.5	V	128,390
D11	Cikini – Menteng Palbatu	6	3.4	VI	18,198
D12	Outer Ring Road – Senayan C.C	4	7.0	VI	23,990
Total					354,454

5 PROJECT LIST OF EAST-WEST CONNECTION IMPROVEMENT PROGRAM

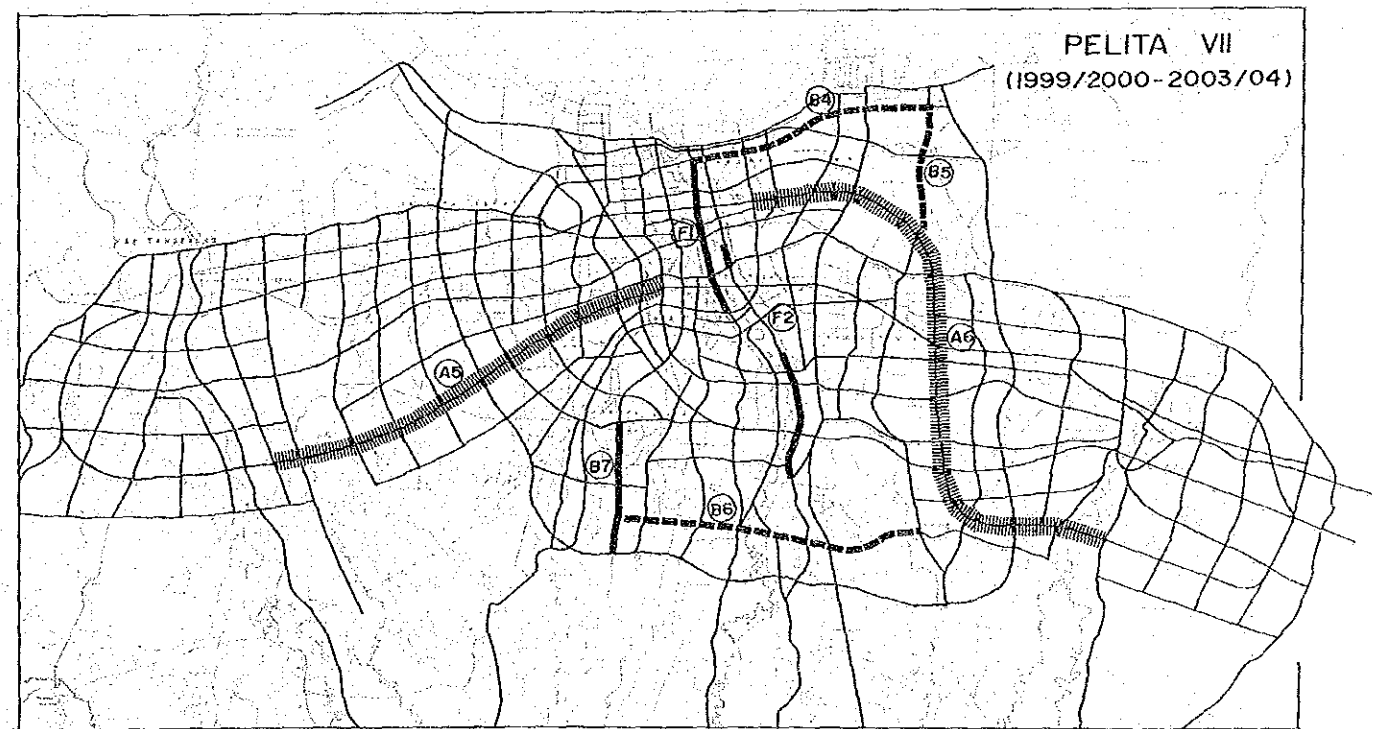
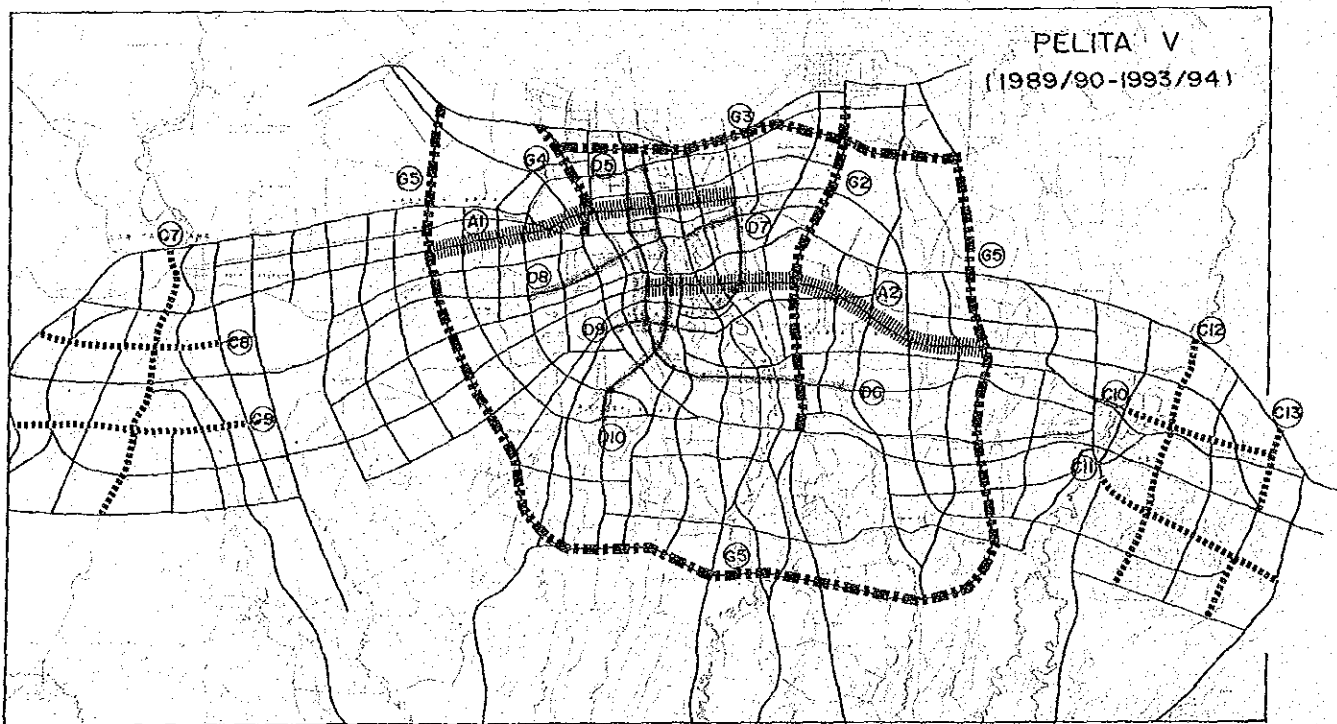
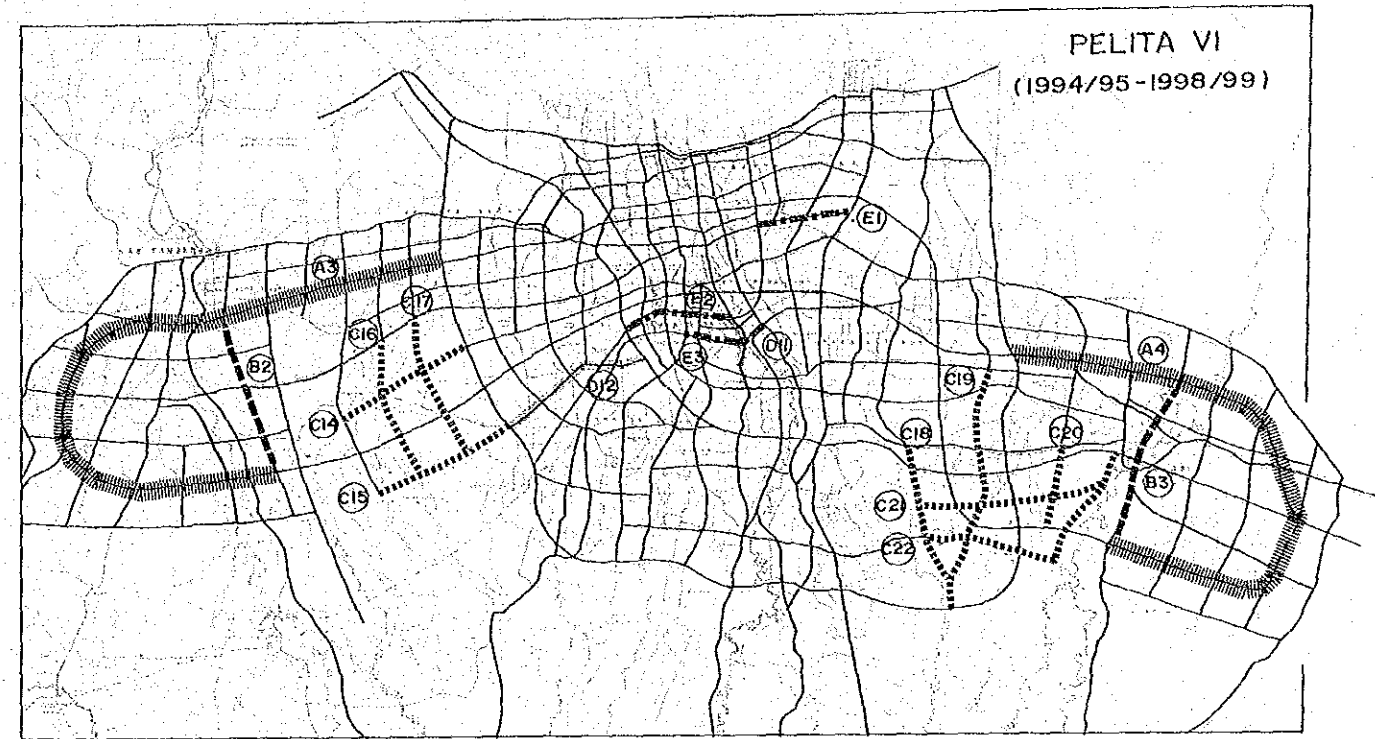
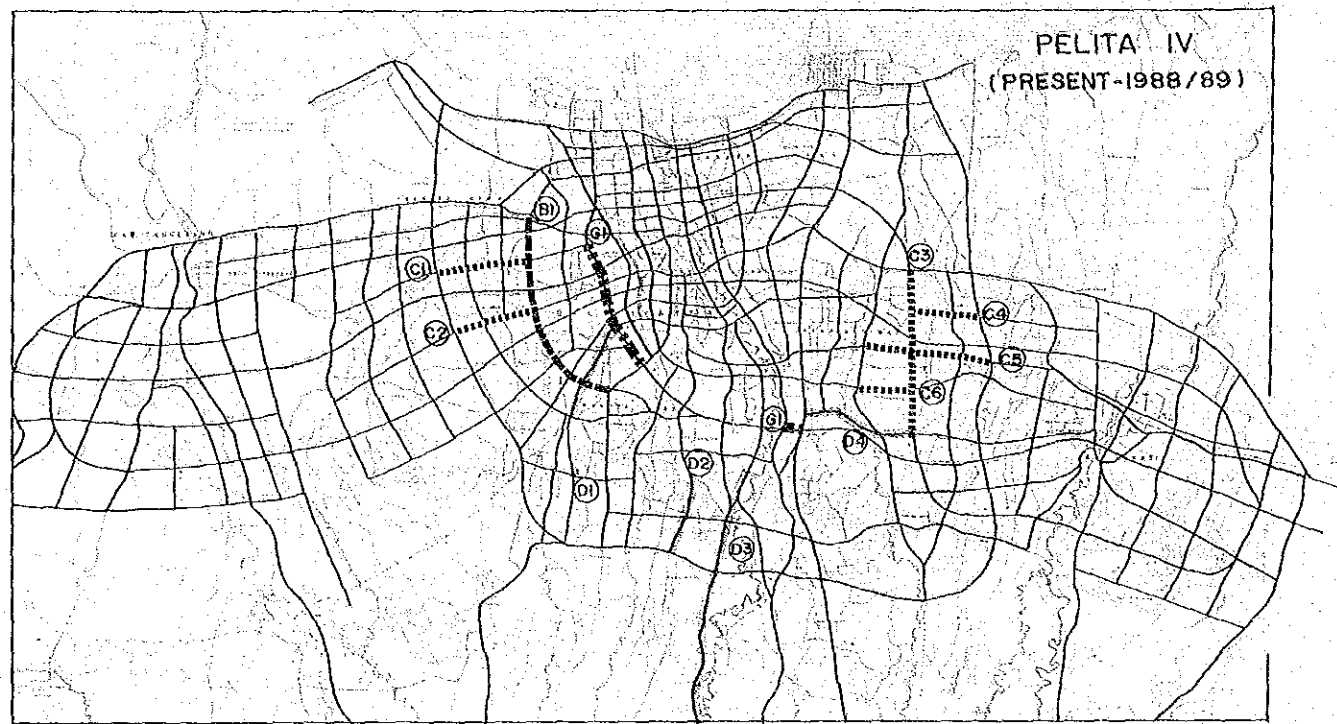
No	Name/Location	No. of Lane	Length (Km)	Implementation Period (Pelita)	Construction Cost (x 10 ⁶ Rp)
E1	Ex-Kemayoran – J.I.U.T. N-S Link	4	4.1	VI	14,636
E2	Cikini – Slipi	4-6	4.8	VI	23,727
Total					38,363

6 PROJECT LIST OF NORTH-SOUTH AXIS STRENGTHENING PROGRAM

No	Name/Location	No. of Lane	Length (Km)	Implementation Period (Pelita)	Construction Cost (x 10 ⁶ Rp)
F1	Cikini – Kampung Bandan	4	4.6	VII	25,612
F2	Senen – Jatinegara – Cililitan	6-8	6.9	VII	15,073
Total					40,685

7 PROJECT LIST OF FREEWAY DEVELOPMENT PROGRAM

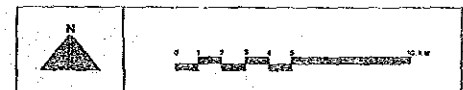
No	Name/Location	No. of Lane	Length (Km)	Implementation Period (Pelita)	Construction Cost (x 10 ⁶ Rp)
G1	J.I.U.T. S-W Arc (Jakarta I.C. – Sec. 13)	6+6/8	7.0	IV	164,500
G2	J.I.U.T. N-S Link (Tg. Priok I.C. – Jakarta I.C.)	6+8	13.0	V	420,600
G3	Jakarta Harbour Road	4	19.0	V	539,900
G4	Northern Extension of S-W Arc	6	4.3	V	85,000
G5	Jakarta Outer Ring Road	4+4	59.4	V	455,089
Total					1,665,089



LEGEND :

- MASS TRANSPORTATION CORRIDOR DEVELOPMENT PROGRAM
- MAJOR ARTERIAL STREET DEVELOPMENT PROGRAM
- ARTERIAL STREET DEVELOPMENT PROGRAM IN THE NEWLY URBANIZING AREA
- PRESENT TRAFFIC PROBLEM ORIENTED PROGRAM

- EAST-WEST CONNECTION IMPROVEMENT PROGRAM IN THE CENTRAL AREA
- NORTH-SOUTH AXIS STRENGTHENING PROGRAM IN THE CENTRAL AREA
- FREEWAY DEVELOPMENT PROGRAM



RECOMMENDED IMPLEMENTATION PROGRAM

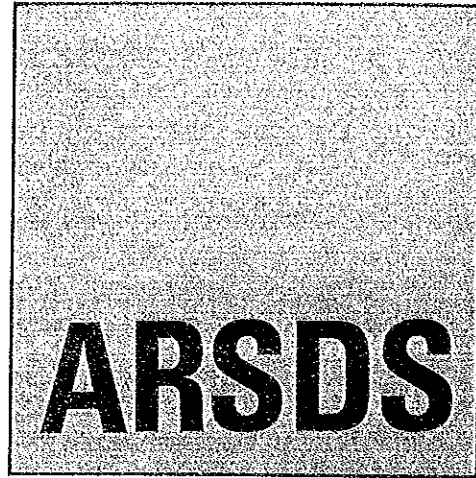
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A ANALYSIS OF URBAN PROBLEMS

A.1 EXISTING TRANSPORTATION PROBLEMS: ROADS AND STREETS



Almost all of the urban travellers in the Jakarta Metropolitan Area depend on roads and streets, since the existing railway cannot attract more than 1% of the total transport demand.

Congestion of roads and streets is already severe in degree and has daily duration in the Central Area and regional corridors as shown in Fig. 3. Moreover, congestion prevails on some streets in the suburban areas despite the low level of private automobile ownership (40 cars per thousand inhabitants, 1985).

Contributing to this road and street congestion is network fault, excessive traffic concentration to limited number of wide streets, mixed traffic and the low proportion of the urban area devoted to roads and streets (only 3.5% of Jakarta, 1982 and 2.0% for arterial road,

1985). The extreme shortage of roads and streets cannot compose an adequate network and cannot enable the differentiation of road/street hierarchy and functions such as artery, collector and local.

The past transportation development relying mainly on road and street development could not keep up with the increased traffic demand in Jakarta. If the existing trend of urban sprawl and car orientation is not changed, it will be impossible to provide enough roads and streets with adequate levels of service to meet the car traffic demand, which is rapidly increasing due to the increase of population, incomes and the urban expansion.

EXISTING ROAD AND STREET NETWORK

The basic regional road network in the Jabotabek area has been constructed up to the 1900's under the strong control of rivers and ground conditions. Most of the roads in the area are located on hilly land with good ground conditions. The rivers originating in the southern mountain range flow towards the north. These physical constraints forced the expansion of Jakarta city towards the south. Thus, the east-west connection has remained without a direct connection. The main frame of the street network in DKI Jakarta was constructed in the 1960's. The network basically forms a radial and ring pattern with wide streets of more than 8 lanes. Although the streets in the north-south direction are well developed, the streets in the east-west direction lack continuity. Bottlenecks are seen in many places. Thus, the existing street network in DKI Jakarta does not form a network in terms of connection.

The absolute quantity of arterial streets is insufficient. The total length of arterial streets/roads in DKI Jakarta in 1985 was 621 km and the area was 1,352 km². The estimated road ratio for the arterial streets of 2.0% in DKI Jakarta is extremely low. The only sufficiently dense street networks are seen in Banteng, Menteng and Kebayoran Baru. The remaining areas are mostly short of streets.

PROGRESS OF ROAD/STREET NETWORK DEVELOPMENT

The development of the street network has progressed slowly compared with the rapid urbanization. Two regional freeways have recently been constructed and several streets/roads have been improved by new construction and road widening since the 1960's as shown in Fig. 1. But compared with the road/street network in the DKI Master Plan 1965-1985, few planned roads/streets have been achieved.

The freeway system has been constructed systematically according to the plans. On the other hand, the improvement of streets have not been systematically approached, but have been improved against the actual problems.

MOTORIZATION

Motorization in DKI Jakarta has progressed rapidly. The number of registered motor vehicles was 488,719 in 1975 and this grew to 1,284,615 in 1985. The growth rate in these 10 years was 10.1% p.a., which is higher than the population growth rate of 3.8% p.a.. The number of registered buses for private use indicates a remarkably high growth.

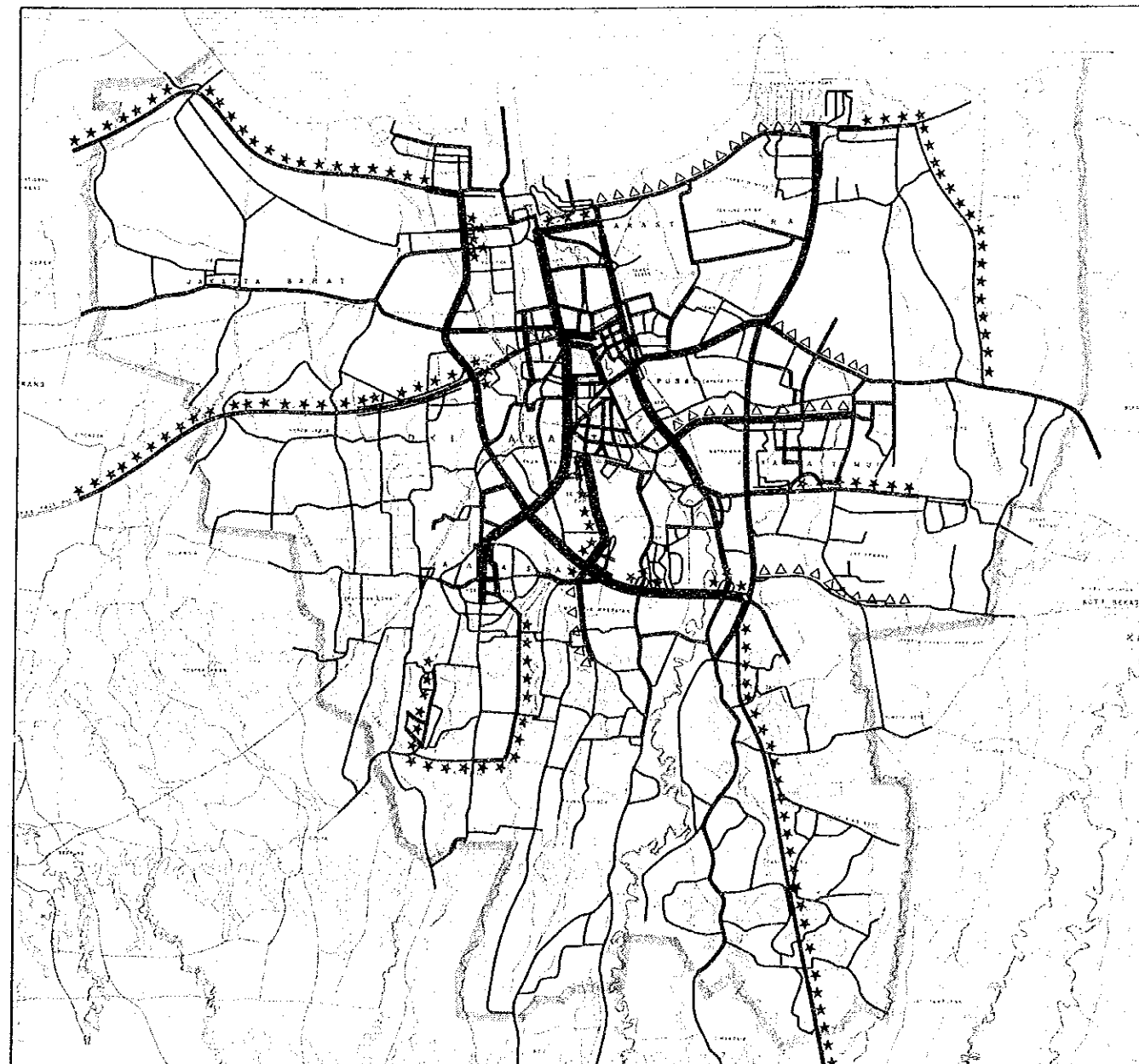
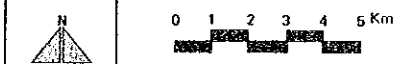


Fig. 1
EXISTING ROADS IN DKI JAKARTA

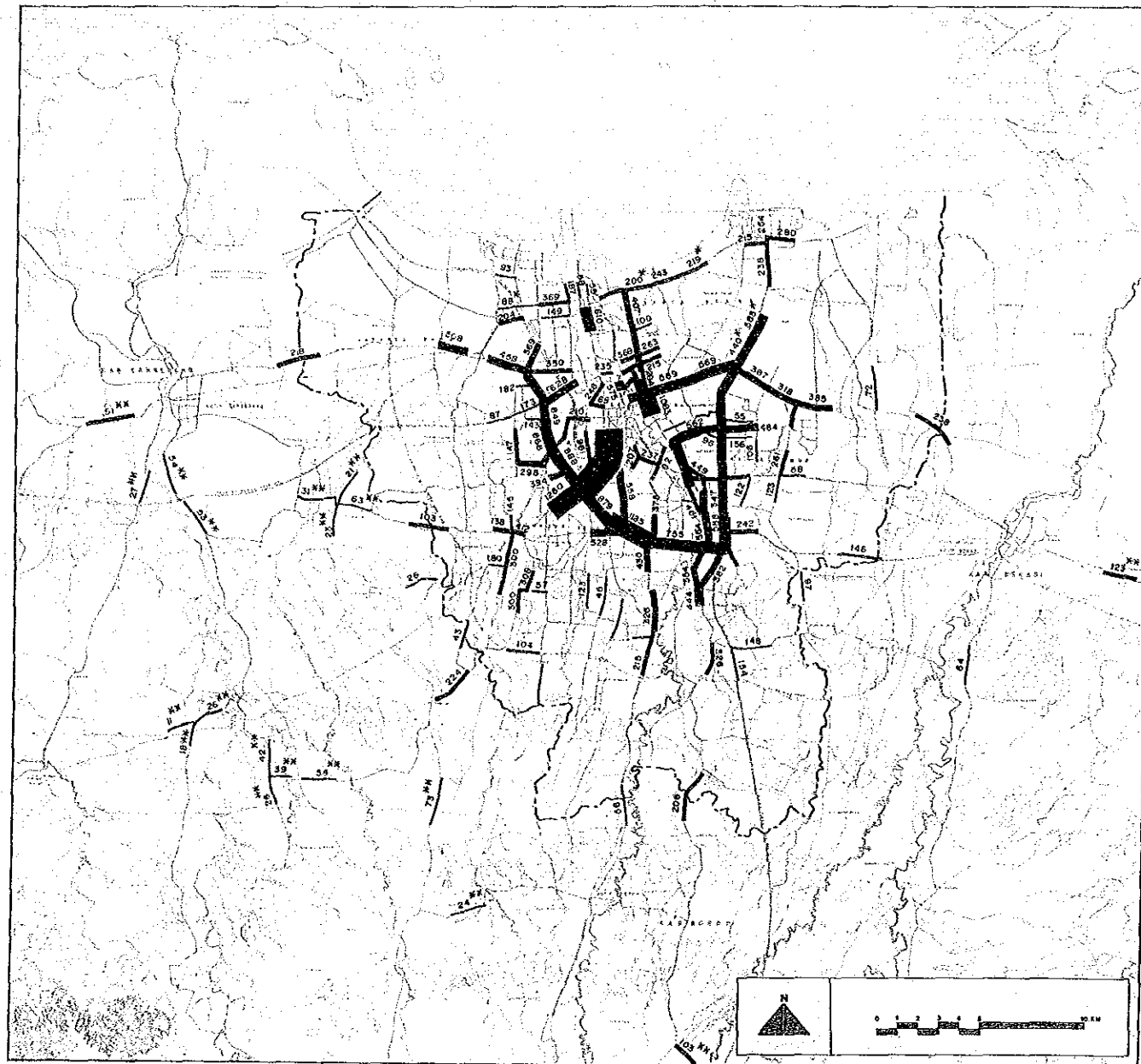
LEGEND

- 2 - LANES
- 4 - LANES
- 6 - LANES
- 8 - LANES
- MORE THAN 10 - LANES
- DKI JAKARTA BOUNDARY
- MAJOR ROAD IMPROVEMENT 1960'S - 1986
- *** NEW ROAD CONSTRUCTION
- △△△ ROAD WIDENING
- * NEW CONSTRUCTION (FLYOVER)

Source : ARSDS INVENTORY SURVEY



ARTERIAL ROAD SYSTEM
DEVELOPMENT STUDY
IN JAKARTA METROPOLITAN AREA

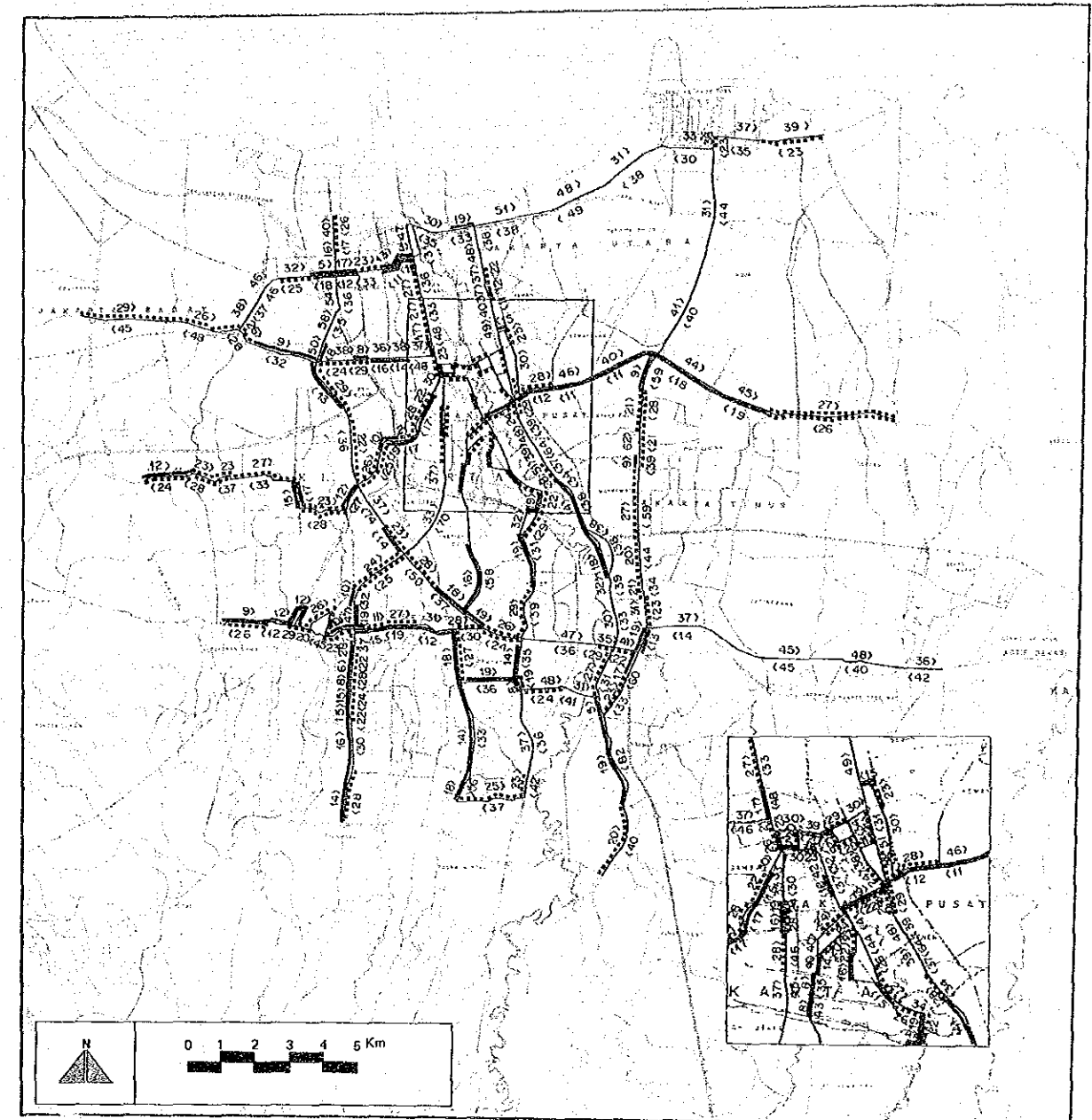


Source : ARSDS TRAFFIC COUNTING SURVEY, SEPT. & OCT., 1985
 **: J.I.U.T PROJECT PART V, 1984
 **: ARSDS TRAFFIC COUNTING SURVEY IN BOTABEK, MAY 1986

UNIT : HUNDREDS VEHICLES

NOTE : THE FIGURES ARE THE TRAFFIC VOLUMES OF 4-WHEEL VEHICLES FOR A CONTINUOUS 16 HOURS (6:00 - 22:00) EXCEPT FOR THE FIGURES WITH **
 THE FIGURES WITH ** ARE THE TRAFFIC VOLUMES OF 4-WHEEL VEHICLES FOR A CONTINUOUS 14 HOURS (6:00 - 20:00)

Fig. 2 PRESENT TRAFFIC FLOWS ON STREETS IN THE JAKARTA METROPOLITAN AREA



LEGEND

- UNSTABLE FLOW (20 - 30 km/h)
- FORCED FLOW (< 20 km/h)
- SURVEYED ROUTE

NOTE

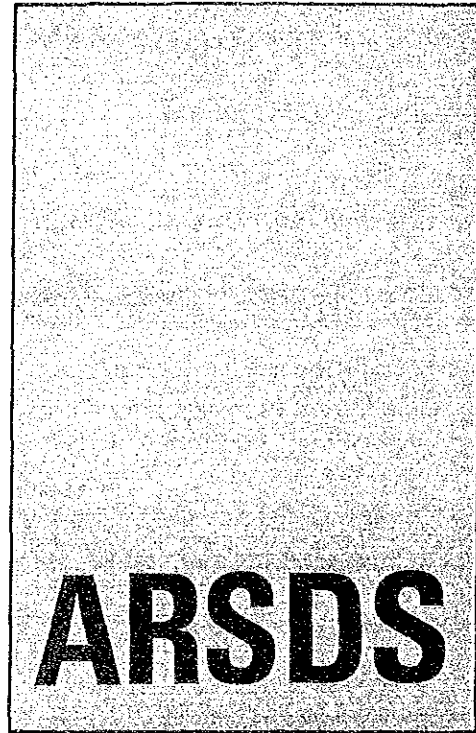
FIGURES SHOW THE AVERAGE OVERALL SPEED (km/h) BY ROAD SECTION

SOURCE

ARSDS TRAVEL SPEED SURVEY, 1985

Fig. 3 LEVEL OF SERVICE IN MORNING PEAK HOURS

A.2 EXISTING TRANSPORTATION PROBLEMS: BUS AND RAILWAY



Although bus trips account for about 50% of all trips made by motorized transport, because of the following there are no reliable public transport modes at present in the Jakarta Metropolitan Area:

- The conventional bus services lack reliability for bus passengers in terms of punctuality and unstable operation. Bus operations are adversely affected by street congestion.
- The coverage of the existing railway system is limited. The conditions of railway facilities and services (mixed train operation, frequent services, punctual/stable operation, comfort, lack of station plaza and feeder service, etc.) are insufficient for urban/suburban railway services. Moreover, the landuse along the railway lines was formed with no relation to the railway, thereby making it difficult for the existing railway to attract more passengers.

These deficiencies of public transportation encourage the more affluent people to use automobiles and motorcycles as shown in Table 1, resulting in more congestion on the roads and streets.

Table 1 CHANGE IN MODAL COMPOSITION OF PERSON TRIPS: 1972 - 1985

	JMATS 1972	ARSDS 1985
Public Transport:		
Railway	1.2%	0.3%
Bus	59.6%	50.9%
Taxi, Bajaj	0.2%	5.8%
Sub Total	61.0%	57.0%
Private Transport:		
Private Car	24.3%	22.8%
Motorcycle	14.7%	20.2%
Sub Total	39.0%	43.0%
Total	100.0%	100.0%

BUS TRANSPORTATION

Bus is the most significant mode of public transportation in DKI Jakarta. More than 3,500 thousand person trips were made by Jakarta residents using buses on a typical weekday in 1985. These bus trips account for about 50% of all the trips made by motorized modes of transportation.

COVERAGE OF BUS SERVICE

The large bus and micro bus service coverage areas are spread out to most parts of the urban and suburban areas in DKI Jakarta, except for the fringe areas with few inhabitants. However, some districts in the suburban area and urban kampung area are not completely covered by bus service; thus, some passengers are obliged to walk long distances or use becaks/ojeks to access the bus route streets. This low accessibility to bus routes is caused by the poor quality and quantity of arterial and collector streets.

In spite of the fact that major person trip flows are concentrated to the Central Area, passengers cannot directly access the Central Area from some parts of the suburban area, especially from the southern suburban area.

PROBLEMS FOR BUS PASSENGERS

The present bus services lack reliability for bus passengers as a primary public transport mode in terms of poor punctuality and unstable operations. Travel time by buses is longer than by modes of private transportation, because some bus passengers must transit at bus terminals and also because the operating bus speed is slow. There are two reasons for this low speed operation.

- 1) Bus operations directly suffers from traffic congestion on the streets
- 2) Bus crews operate according to their best interests and wait a long time at bus terminals and stop at any place to collect passengers

Since a fixed bus fare is implemented for one ride bus, transit results in a high total transportation cost.

RAILWAY TRANSPORTATION

The railway network in the Jakarta Metropolitan Area consists of the Central Line, Western Line, Eastern Line and Tanjung Priok Line in Jakarta, and the four radial routes of Tangerang, Merak, Bogor and Bekasi Lines as outlined in Fig. 4.

Railway is a transportation mode operating on a separated right-of-way. Thus railway has the potential to serve as a reliable public transportation mode. Since the railway system was originally developed for goods movement to the port in Jakarta and for region-wide passenger movements, it has been unsuitable for an urban railway system in the progress of urbanization. The condition of railway facilities has grown even worse due to the lack of maintenance. Recent railway improvements have been made for a suburban railway.

At the present time railway carries only 0.7% of the passengers by mass transit in DKI Jakarta, but it carries 12.1% of the mass transit passengers between Jakarta and Botabek.

However, the railway network cannot provide sufficient capacity for commuter service in consequence of the mobilization of middle/long distance trains and cargo trains. Large investment is necessary for rehabilitation of damaged facilities.

Up to now the existing railway system has not been able to be utilized as an urban railway. There are two reasons why the existing railway system is inadequate for urban transportation. First of all, the railway facilities themselves cannot provide urban railway transportation with a high quality of service, such as a loop line operation with high frequency. Secondly, the connection with other transportation modes is insufficient due to the lack of firm feeder systems and interchange facilities, such as station plazas, access streets and so on.

There is another aspect for the low utilization of the railway system. It is not a problem of the railway system itself, but the problem concerns urban structure.

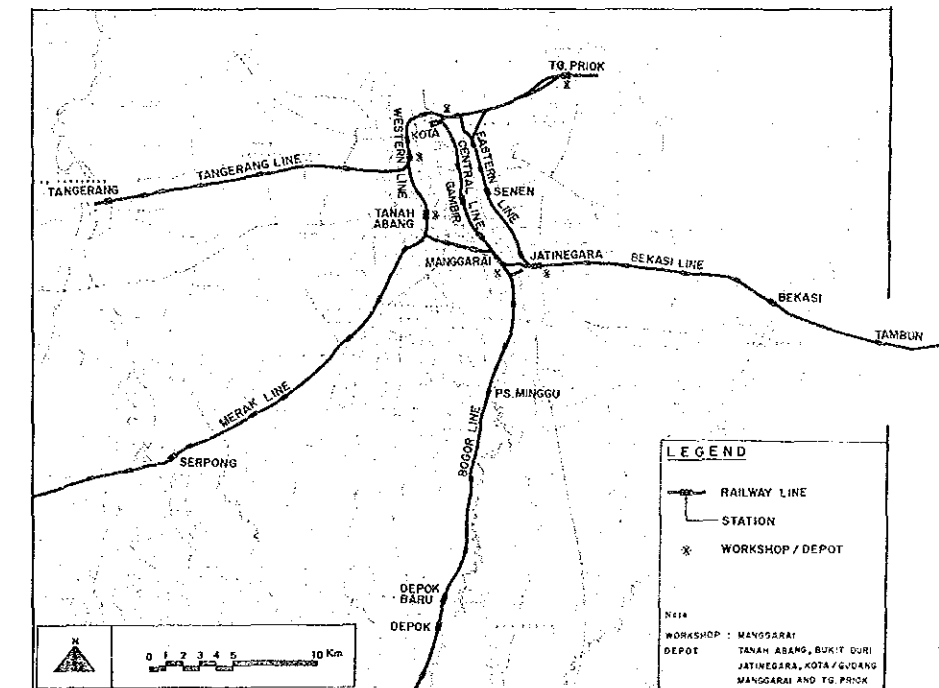
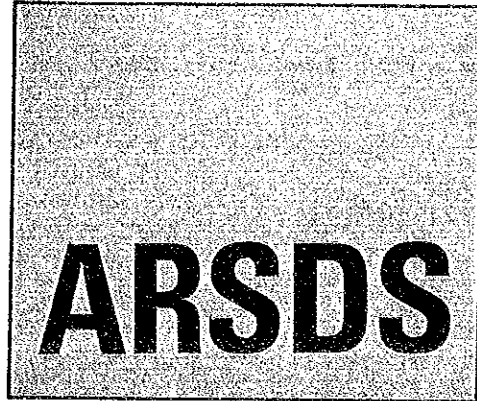


Fig. 4 EXISTING RAILWAY NETWORK IN JAKARTA METROPOLITAN AREA

A.3 EXISTING TRANSPORTATION PROBLEMS: TRAVEL BEHAVIOR OF PEOPLE



The ARSDS Person Trip Survey shows clearly that differences in income level significantly influence the choice of transport more in Jakarta. Higher income groups make more trips, longer trips, less walking trips and depend on private transport modes to a higher degree. While the high income group prefers private passenger cars, the lower income group, who can not afford automobiles, uses motorcycles as a mode of private transport. As a representative mode of public transport, the conventional bus system, which provides a low level of service at present, is mostly used by the lower middle and low income groups. It is obvious from the modal composition trend that the share of public transport with low levels of service have been decreasing. If the service level of public transportation is not improved, an increase in

the utilization of private passenger cars and motorcycles can not be avoided as income levels rise.

DIFFERENCE IN TRAVEL BEHAVIOR BY INCOME LEVEL

The higher income group has more motive to travel. The number of trips per person per day of the higher income group is higher than that of the lower income group, especially for private matters trips, as shown in Fig. 5. Moreover, the average trip length of the high income level is also longer than that of the lower income group as shown in Table 2. That is, the lower income group travels less frequently, and even when they do go out, they do not or cannot travel far.

The choice of transport mode differs remarkably by the income level of households as shown in Fig. 6. The higher the income level is, the higher is the degree of dependence on private cars. Of all trips by the high income group, 64.2% are made by private car. On the other hand, a public transport mode is used more by persons belonging to lower income groups. On foot etc. trips are also made more by lower income groups. While 57.9% of the low income group trips are made on foot etc., only 15.1% of the high income group trips are made on foot etc. Most of those trips are made by pupils and students. Motorcycles are well used by the upper and lower middle income group as a private transport mode. The travel desire of the low income group is highly restricted by the low availability of transport means according to the economic situation as shown in Fig. 7.

TREND IN MODAL COMPOSITION

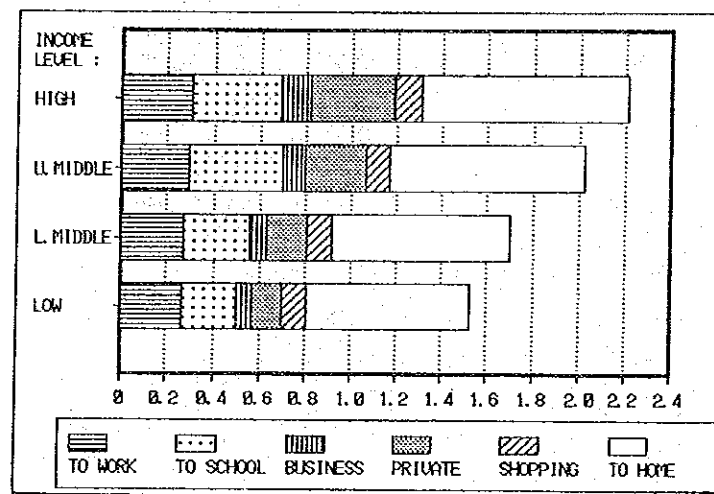
The modal composition of public transport in all modes of motorized transport has decreased from 61.0% in 1972 to 57.0% in 1985 as shown in Table 1 of the previous section. To the contrary, the share of private transport has increased, especially in the share of motorcycles, which has increased, especially from 14.7% in 1972 to 20.0% in 1985. This change indicates that people have preferred private transport, as a convenient and reliable transport, to public transport.

Table 2 TRIP LENGTH AND INTRA-ZONAL TRIP RATE OF "TO WORK" AND "TO SCHOOL" TRIPS BY INCOME GROUP

Trip Purpose	Income Group	Trip Length (km)		Intra-Zonal Trip Rate (%)
		Average	Median	
To Work	High	8.98	6.47	13
	Upper-Middle	8.05	6.17	15
	Lower-Middle	7.02	4.99	23
	Low	5.58	3.19	34
To School	High	4.36	3.05	38
	Upper-Middle	3.47	1.76	50
	Lower-Middle	2.65	1.39	62
	Low	2.14	1.21	70

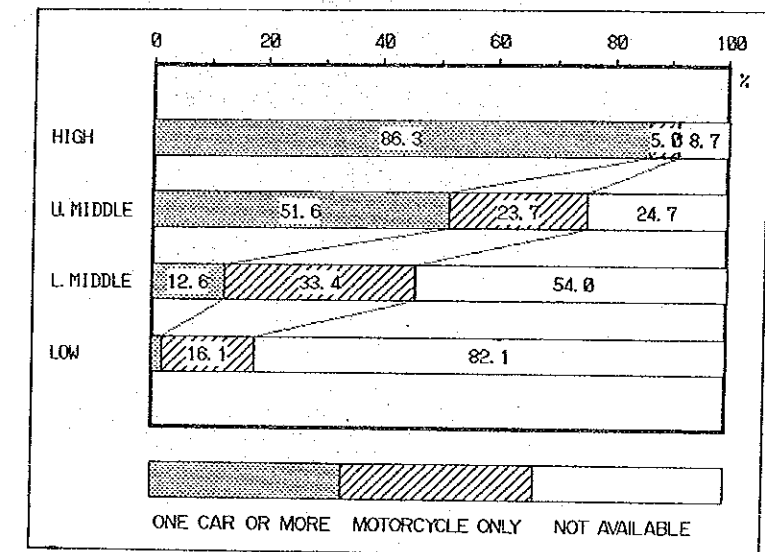
Source: ARSDS Home Visit Survey, 1985

Note : 1) Trips made by registered Jakarta residents
2) Intra-zonal trip rate is calculated based on small zones



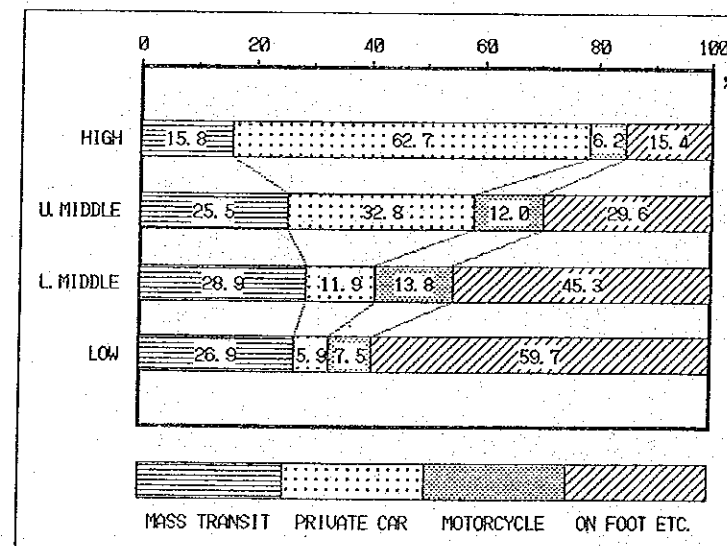
SOURCE : ARSDS ESTIMATE, 1985

Fig. 5 NUMBER OF TRIPS PER PERSON PER DAY BY INCOME LEVEL



SOURCE : ARSDS HOME VISIT SURVEY, 1985

Fig. 7 AVAILABILITY OF MOTOR VEHICLE BY INCOME LEVEL



SOURCE : ARSDS HOME VISIT SURVEY, 1985

Fig. 6 MODAL COMPOSITION BY INCOME GROUP

Table 3 NUMBER OF PERSON TRIPS BY JAKARTA RESIDENTS BY MODE OF TRANSPORT AND INCOME GROUP

UNIT: 1,000 PERSON TRIPS

	MASS TRANSPORT	PRIVATE VEHICLE	M. CYCLE	ON FOOT ETC.	ALL MODES OF TRANSPORT	
HIGH		107	422	41	104	674
U. MIDDLE		494	635	231	573	1,933
L. MIDDLE		1,401	576	669	2,201	4,847
LOW		1,525	334	424	3,383	5,666
TOTAL		3,527	1,967	1,365	6,261	13,120

SOURCE : ARSDS ESTIMATE, 1985

PERSON TRIPS RELATED TO JAKARTA

About 14 million person trips related to DKI Jakarta were made on a typical weekday in 1985. A general classification of all person trips related to Jakarta is shown in Table 4. Of all the trips related to DKI Jakarta, internal trips account for 91.3%, and the external trips, with one end inside and the other end outside of Jakarta, comprise 8.2%. The through trips are not quite significant, accounting for only 0.5% of all the trips.

The breakdown of the external trips is : Jakarta - Botabek 608,000 trips; Jakarta - Outside of Jabotabek 533,000 trips. "To work" trips from Botabek to Jakarta account for only 76,000 trips. Thus, the present person movement between Jakarta and Botabek is not very large.

The total number of trips made by Jakarta residents amounts to 13,121,000 trips per day, and the total number of Jakarta residents is 7,829,000 persons. Thus, the number of trips per person per day is 1.68.

TRIP ATTRACTION

Trip attraction is extremely concentrated in the Central Area, accounting for about 25% of the total attracted trips in DKI Jakarta as shown in Fig. 8. Major person trip flows terminate in the Central Area from the suburban area, as well as from the urban area as shown in Fig. 9. Kebayoran and Tanjung Priok are other districts with a potential to attract trips from their surrounding area.

TRIP DISTRIBUTION

As shown in Fig. 9, major person trip flows are seen in the area surrounded by the S-W arc and N-S link of the Intra Urban Tollway and its circumference area, which consisted of zones No.1, 2, 3, 8, and 11.

TRIP PURPOSE COMPOSITION

Trip purpose composition is shown in Fig. 10. "To work" trips and "To school" trips are the largest two trips except "To home", accounting for 16.4% and 16.5% respectively of all the trips made by the Jakarta residents by all transport modes including non-motorized transport.

Of all the trips by motorized transport modes, "to work" trips amount to 22.6%, whereas "to school" trips account for only 11.5% as shown in Fig. 11.

TRANSPORT MODE

Significantly, about 40% of all the trips by Jakarta residents are made on foot.

About 50% of all the trips made by motorized transport modes are made by buses. This indicates the high degree of dependence of the Jakarta residents on buses for their personal travel needs. On the contrary, railway is a quite unimportant transport mode at present, which accounts for only 0.3% of all the trips made by motorized transport.

Next, of all trips made by motorized transport modes, 14.2% are made by private passenger cars, 6.1% by mini buses for private use, and 20.2% by motorcycles. These statistics clearly indicate that not only private passenger cars, but also motorcycles are significant as modes of private transport for the Jakarta residents.

Table 4 PERSON TRIPS RELATED TO JAKARTA ON A TYPICAL WEEKDAY, 1985

Classification of Major Person Trip Flow	Approx. Number of Daily Trips (x 1000)	Percent
Internal Person Trips:		
by Jakarta Residents	12,722	90.7
by non-Jakarta Residents	70	0.5
Total of Internal Person Trips	12,792	91.2
External Person Trips:		
by Jakarta Residents	392	2.8
by non-Jakarta Residents	749	5.4
Total of External Person Trips	1,141	8.2
Through Person Trips:		
by Jakarta Residents	6	0.1
by non-Jakarta Residents	69	0.5
Total of Through Person Trips	75	0.6
Grand Total - All Person Trips	14,008	100.0

Source: ARSDS estimate based on ARSDS Home Visit Survey, 1985
: ARSDS Cordon Line Survey, 1985

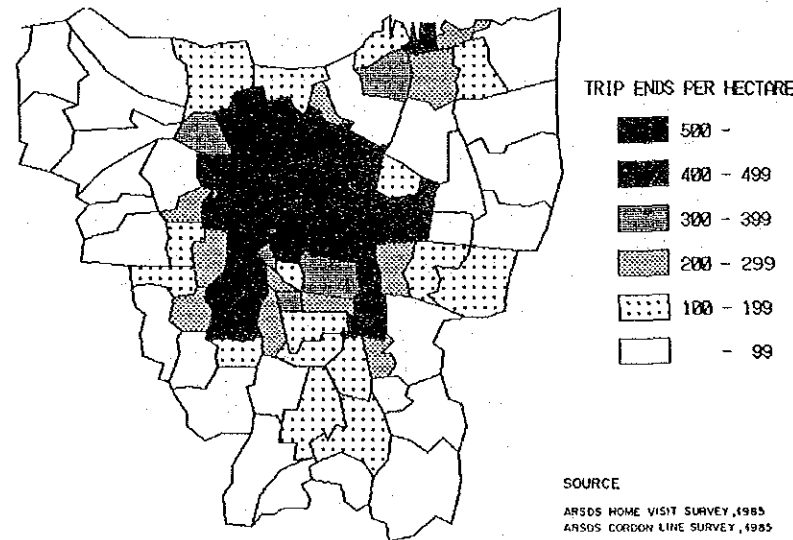


Fig. 8 TRIP ATTRACTION IN DKI JAKARTA, 1985

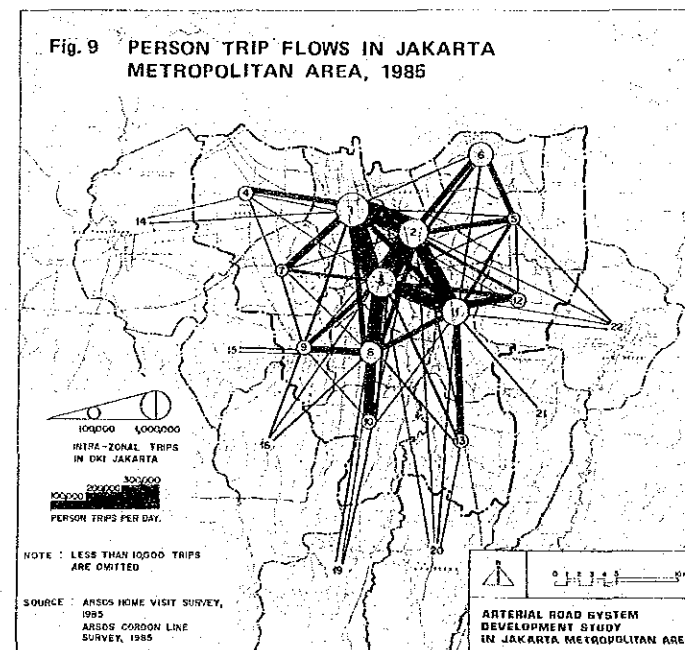


Fig. 9 PERSON TRIP FLOWS IN JAKARTA METROPOLITAN AREA, 1985

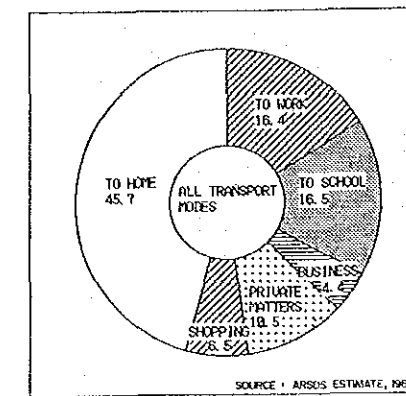


Fig. 10 TRIP PURPOSE COMPOSITION OF ALL TRIPS

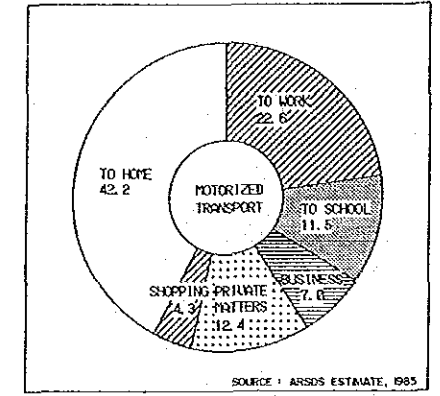


Fig. 11 TRIP PURPOSE COMPOSITION OF TRIPS BY MOTORIZED TRANSPORT

Table 5 PERSON TRIPS MADE BY JAKARTA RESIDENTS BY TRANSPORT MODE AND TRIP PURPOSE

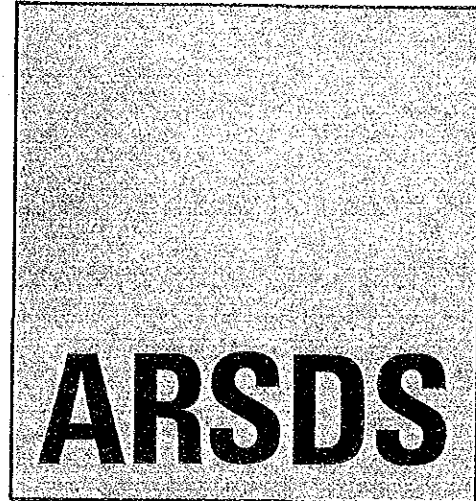
MODE OF TRANSPORT	TRIP PURPOSE							TOTAL
	TO HOME	TO WORK	TO SCHOOL	BUSINESS	PRIVATE	SHOPPING		
RAILWAY	8,643	6,862	1,476	807	2,928	145		20,861
	41.4	32.9	7.1	3.9	14.0	0.7		100.0
	0.1	0.3	0.1	0.1	0.2	0.0		0.2
BUS	1,645,397	728,604	560,085	92,440	344,746	159,594		3,530,867
	46.6	20.6	15.9	2.6	9.8	4.5		100.0
	27.4	33.9	25.9	16.1	25.1	18.6		26.9
TAXI/BAJAJ	191,769	41,335	40,220	13,889	77,222	36,858		401,293
	47.8	10.3	10.0	3.5	19.2	9.2		100.0
	3.2	1.9	1.9	2.4	5.6	4.3		3.1
PRIVATE CAR	476,140	332,506	116,218	196,003	239,205	51,847		1,411,918
	33.7	23.5	8.2	13.9	16.9	3.7		100.0
	7.9	15.5	5.4	34.1	17.4	6.0		10.8
TRUCK PICK-UP	45,078	51,903	4,370	50,951	15,096	4,128		171,526
	26.3	30.3	2.5	29.7	8.8	2.4		100.0
	0.8	2.4	0.2	8.9	1.1	0.5		1.3
MOTORCYCLE	557,169	410,444	74,917	134,868	181,103	43,255		1,401,757
	39.7	29.3	5.3	9.6	12.9	3.1		100.0
	9.3	19.1	3.5	23.5	13.2	5.0		10.7
BECAK BICYCLE	457,961	111,920	125,194	21,140	101,117	105,015		922,349
	49.7	12.1	13.6	2.3	11.0	11.4		100.0
	7.6	5.2	5.8	3.7	7.4	12.2		7.0
ON FOOT	2,617,342	462,266	1,239,136	64,074	410,746	457,330		5,250,893
	49.8	8.8	23.6	1.2	7.8	8.7		100.0
	43.6	21.5	57.3	11.2	29.9	53.2		40.0
UNKNOWN	2,445	1,050	1,172	279	1,681	669		7,296
	33.5	14.4	16.1	3.8	23.0	9.2		100.0
	0.0	0.0	0.1	0.0	0.1	0.1		0.1
TOTAL	6,001,944	2,146,890	2,162,789	574,452	1,373,843	858,842		13,118,760
	45.8	16.4	16.5	4.4	10.5	6.5		100.0
	100.0	100.0	100.0	100.0	100.0	100.0		100.0

SOURCE : ARSDS ESTIMATE 1985

NOTE : UPPER PERSON TRIPS
MIDDLE PERCENT OF ALL THE TRIPS OF EACH MODE OF TRANSPORT
LOWER PERCENT OF ALL THE TRIPS OF EACH TRIP PURPOSE

THE TOTAL NUMBER OF PERSON TRIPS WERE ADJUSTED BASED ON THE INTERMEDIATE CENSUS POPULATION (SUPAS '85) IN THE ARSDS ESTIMATE 1985

A.4 EXISTING SOCIO-ECONOMIC AND URBAN STRUCTURE PROBLEMS



The excessive concentration and rapid increase of population and economic activities to DKI Jakarta causes various urban problems not only in transportation, but also in the socio-economic activities of people and the urban environment.

The Cell System (road network), urban sprawl (housing) and ribbon development (commerce and business) are the major characteristics of the existing urban structure in the Jakarta Metropolitan Area, and these cause various demerits, not only in transportation, but also in other activities.

At present Jakarta has an urban structure which is, in spite of traffic congestion, convenient for car users. This convenience for car usage and the deficiencies of urban public transportation encourage the more affluent people to use automobiles and motorcycles. The urban sprawl results in additional investment to strengthen the capacity of existing roads, and this causes additional urban sprawl and investment. Moreover, because the landuse formed by urban sprawl is dispersed, the provision of urban infrastructure cannot be efficient.

In this sense, the transportation problems are closely related to the socio-economic and urban structure problems. The analysis of urban problems prove it is impossible to provide enough transportation facilities in the Jakarta Metropolitan Area, with an adequate level of service to meet traffic demand, by transportation sector planning alone. Therefore, the transportation development plan should be made in consideration of urban development to achieve the regional and urban development objectives.

EXISTING SOCIO-ECONOMIC PROBLEMS IN REGION

Indonesia's average growth rate of population is about 2.0% p.a.. DKI Jakarta has maintained a population growth at about 4.0% in the last 25 years. The Botabek region also recorded a similar population growth rate since 1971.

RAPID URBANIZATION IN PROGRESS

In the 1970's the urbanization started throughout the country and the urban population occupied about one-fourth of the total population at a growth rate of 5.3% p.a..

In the Botabek region the urban population grew at 18.0% p.a., with a high population growth in the suburban area beyond the boundary of DKI Jakarta and a population decrease in the central area of DKI Jakarta.

The urbanization began to spread south of DKI Jakarta in the 1970's as people sought a better living environment. The increase in the urban population was largely to the south, but the increasing rates of urban population to the east and west of DKI Jakarta were almost the same as that to the south.

INSUFFICIENT EMPLOYMENT OPPORTUNITIES

According to the 1971 and 1980 census data, the unemployment rate improved significantly. However, the employment situation was comprised of many temporary workers.

Unemployment rates were remarkably high in the young age group less than 25 years of age.

The increased labor force was mainly absorbed by the informal sector. The creation of job opportunities in the formal sector were not satisfactorily realized even in the relatively favorable conditions of economic development in the 1970's.

The major industrial sectors which created job opportunities were the government/services sector, manufacturing sector and trading sector. Among others, a rate of employment growth was notably high in the manufacturing sector in the 1970's.

EXISTING PROBLEMS OF URBAN STRUCTURE

It was pointed out from the socio-economic side that the concentration of employment and population in Jakarta is still dominant, but at the same time that urbanization is vigorously taking place in Botabek surrounding DKI Jakarta.

This process can be seen physically in the following two spontaneous urban development forms:

- Housing
Suburbanization in the form of loose spreading sprawl.
- Commerce, Business and Service
Ribbon development along both large and small arterial streets with facilities of corresponding sizes. The existing primary centers are all concentrated inside of the Jakarta Intra Urban Tollway.

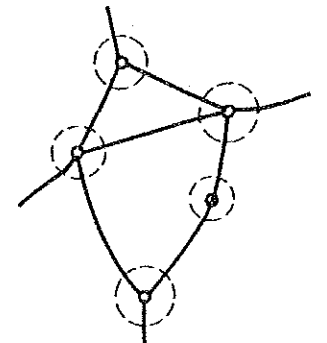
The above are the result of spontaneous urban development and these cause the following demerits:

- Traffic concentration toward the Central Area of Jakarta cannot be reduced
- The housing development in the form of loose spreading sprawl requires inefficient investment for infrastructure in the suburban area
- The commerce, business and service facilities have limited accumulation capacity, because they have to be located in narrow width along streets
- Ribbon development of commerce, business and service facilities create congestions and jams because of the mixture of access and through traffic, and prevent, as a result, their own growth
- Their development does not correspond with mass transportation development and accordingly a multified effect such as among the accumulation of activity centers and mass transportation development cannot be expected
- Therefore this type of development cannot become a potential and incentive element, or pole, to induce planned urban development in such a case as the development toward the east and west

These spontaneous urban developments are also fostered by the existing street network of the Jakarta Metropolitan Area, which the ARSDS team defines as a Cell System.

The Cell System is the street network usually found in rural areas where each village forms a cell and is connected by a simple street network. Because working places and houses are situated close together, big commuting traffic does not occur, and traffic demands are small. The following is noted of this Cell System street network:

- Flow of goods and persons are mixed
- Separation according to speed difference is not practiced
- Both access and through traffic use the same roads
It is therefore necessary to pass other villages when going from one village to another



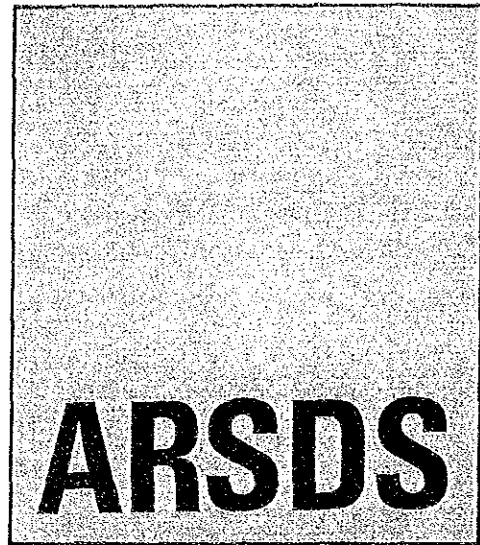
As far as the town remains small and working places and houses are located close together, it is an efficient street network and suitable for compact urban formation.

But in proportion, as the town develops and expands, the following problems emerge:

- Differentiated traffic management becomes impossible between goods and persons and between access and through traffics
- It produces traffic congestions and jams, and therefore reduces mobility and accessibility
- It becomes incapable of coping with the expanded commuter traffic resulting from the dissociation between working and housing places
- Development of planned landuse becomes difficult because of the undifferentiated street functions, and it is, therefore, apt to induce spontaneous landuse
- The parallel increase in population and traffic volume thereby makes this system more and more inadequate to cope with the demands because of its inflexibility toward urban growth and change

Considering these various demerits brought on by spontaneous urban development forms and the Cell System street network, the ARSDS team finds it necessary to decentralize employment and population in a more planned efficient development form.

B REVIEW OF EXISTING DEVELOPMENT PLANS



Through the review of the existing development plans related to the Jakarta Metropolitan Area, the two following important directions to solve the future urban problems were identified in the development objectives.

- The decentralization of urban settlement, economic activities and urban functions from DKI Jakarta.
- The establishment of the major role of mass transportation

One of the policy solutions for the urban transportation problems of a megalopolis, from an urban planning point of view, is to change the urban structure from one which allows almost all of the traffic to concentrate to one central area, to one which disperses traffic to centers of the multi nucleus pattern. Moreover, another solution reinforcing the solution by the multi nucleus system, is to establish mass transportation corridors connecting centers so as to convert the urban structure from one which depends on individual transport modes, to one which depends on mass transport modes.

MAJOR PLANS RELATED TO THE JAKARTA METROPOLITAN AREA

There are at present three plans related to the regional development in the Jakarta Metropolitan Area. These are as follows:

- National Level: The Fourth Five-Year National Development Plan of Indonesia (Repelita IV)
- Regional Level: Jabotabek Development Plan, 2005
- Local Level : DKI Structure Plan, 2005

As described in the "Outline of State Policy" on regional development published by the Ministry of Home Affairs, these development plans compliment each other in that the upper level plan provides a guideline for the next lower plan.

PLANNING HISTORY OF JABOTABEK

The current DKI Structure Plan 2005 and the Jabotabek Development Plan 2005 have been established based on several planning studies conducted since 1967. Some important policies recommended in these past studies have been inherited, with some revision, into the current policies.

The significant proposals such as the east and west development, the restraint areas for development, etc., were made based on an ecological study in the Jabotabek Metropolitan Development Plan, 1980. The mono-centric city structure without sub-centers was abandoned when the existing DKI Jakarta Structure Plan 2005 was authorized in 1984. The conventional bus system is considered to be the major mode of public transportation in the future. The future road network has basically remained similar to that in the Jakarta Master Plan, 1965-1985.

DEVELOPMENT OBJECTIVES AND PRIME POLICY

The development objectives defined in the existing Jabotabek Development Plan (Structure Plan) were reviewed in the previous chapter and are accepted by the Study Team as follows:

- Economic growth and the improvement of the standards of living
- Creation of sufficient employment opportunities
- Equitable distribution of income among the people and throughout the region

To achieve these objectives, the decentralization of urban settlements, economic activities and other urban functions from DKI Jakarta is considered as a most vital planning issue. The decentralization policy was also accepted in this study as the prime policy for regional and urban development.

REVIEW OF DEVELOPMENT STRATEGIES

The regional and urban development strategies to achieve the development goals and objectives were reviewed through the analysis of the existing urban problems and the future prospect of the region. The review identified weak points of the existing development strategies proposed in the Jabotabek Development Plan 2005 and the DKI Jakarta Structure Plan 2005. The major weak points are as follows:

- The sub centers in the suburban areas of DKI Jakarta and in Botabek are considered to develop independently, making little use of the existing growth potential of the Central Area of DKI Jakarta. This is not only unlikely, but, if possible, a huge investment would be required to encourage such development.
- No strong incentives are given to decentralize the existing urban functions and activities from the Central Area of DKI Jakarta.
- An insufficient provision of urban infrastructure is considered to be able to supply enough land to accommodate the increased population in the east and west areas.

GENERAL TRANSPORTATION DEVELOPMENT POLICY

In the Jabotabek Development Plan 2005 and the DKI Jakarta Structure Plan, the following three directions of transportation improvement are described:

- 1) The predominant role of medium/mass transportation should be established to attract the higher income population, considering there will be an increase in the high and middle income population resulting from future growths in incomes
- 2) More rational use must be made of the existing and future transportation. Rational use must be made of the streets to increase the person carrying capacity of streets by restraining private automobile use and by giving priority to bus services
- 3) Transportation investment should be more efficient in the long perspective. This implies that the preferred development for dealing with traffic should be induced in a long perspective

NEEDS TO REVIEW TRANSPORTATION DEVELOPMENT POLICY AND PLAN

The ARSDS agrees with the general transportation development policy described above. However, the transportation networks proposed in the Jabotabek Development Plan 2005 and in the DKI Jakarta Structure Plan 2005 will not achieve the development objectives, especially for the decentralization of job opportunities away from the Central Area of DKI Jakarta and for the inducement of housing development in the preferred zone. The reasons for this are as follows:

- No medium/mass transportation with high speed services is planned except for the modernized existing railway system, which will not have enough coverage over all the major development areas within the metropolitan area
- The street network planned is insufficient from the viewpoint of inducing development of activity centers and housing in the suburban areas, and also in terms that most of the public transportation users will still have to rely on conventional bus services operated on arterial streets

The transportation development policy has to be reviewed, but it cannot be considered separately from the discussion of urban development. Therefore, transportation development will be discussed together with considerations on urban development in the planning study.

Table 6 POPULATION FRAMEWORKS IN JABOTABEK

Unit: 1,000 Persons

	Census Population 1980	Projected Population by Jabotabek Development Plan 2005	Annual Growth Rate (%)
JABOTABEK	11,916 (100.0%)	23,500 (100.0%)	2.8% p.a.
DKI JAKARTA	6,503 (54.6%)	12,000 (51.1%)	2.5% p.a.
BOTABEK	5,413 (45.4%)	11,500 (48.9%)	3.1% p.a.
- BOGOR (Kab. + Kdy.)	2,741 (23.0%)	4,870 (20.7%)	2.3% p.a.
- TANGERANG (Kab.)	1,529 (12.8%)	3,730 (15.9%)	3.6% p.a.
- BEKASI (Kab.)	1,143 (9.6%)	2,900 (12.3%)	3.8% p.a.

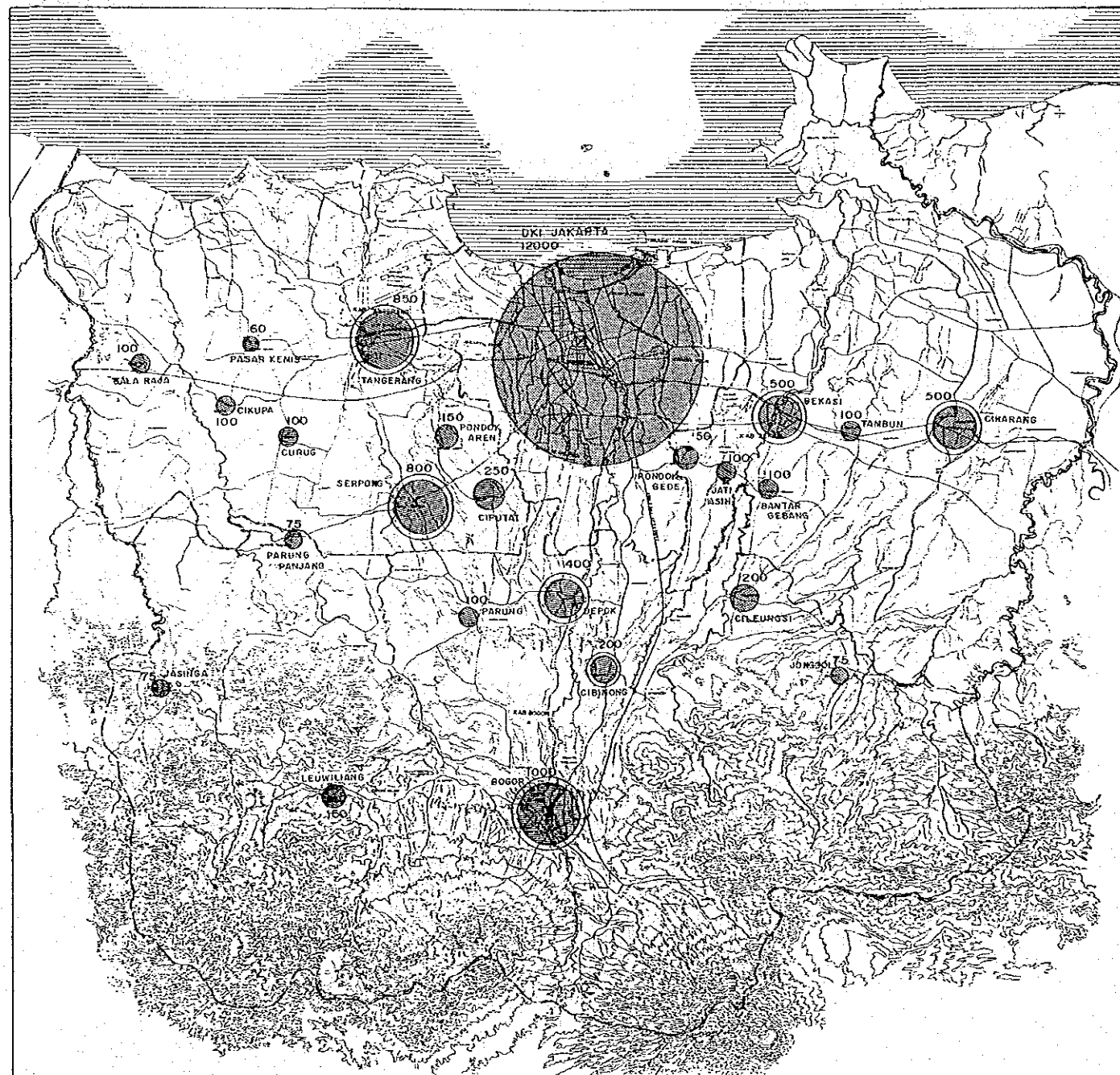
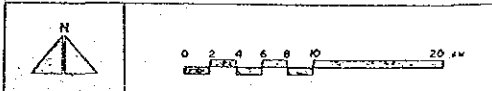


Fig. 12 POPULATION DISTRIBUTION IN JABOTABEK 2005

LEGEND
 ● PRIMARY CENTER
 ● SECONDARY CENTER
 UNIT : 1,000 PERSONS

Source : JABOTABEK DEVELOPMENT PLAN 2005, BKSP JABOTABEK



ARTERIAL ROAD SYSTEM DEVELOPMENT STUDY IN JAKARTA METROPOLITAN AREA

C FUTURE PROSPECT AND REGIONAL DEVELOPMENT PATTERN

C.1 REGIONAL DEVELOPMENT PATTERN



Considering that the rapid increase of population and economic activities in the Jakarta Metropolitan Area are caused by Jakarta's existing attractiveness and advantages in business, employment and education opportunities, formation of the Jakarta Metropolitan Area within a 30 km radius is recommended, where high mobility is secured between outlying activity centers and the Central Area of Jakarta.

This regional development strategy intends to make the best use of the existing urban accumulation and potentials of Jakarta in order to decentralize urban settlements, economic activities and urban functions from Jakarta. The development of self-sustainable cities outside of the metropolitan area with a higher level of independence from Jakarta is encouraged for Balaraja, Cikarang and Bogor.

POPULATION

Assuming the population will grow at the past trend of 4.0% p.a., it will reach 17 million in 2005 with a population density of 260 persons/ha. It is not likely that DKI Jakarta can afford to prepare infrastructure and other urban facilities required for a population of 17 million.

The population of DKI Jakarta is rapidly increasing because of the attractiveness of its business, employment and education opportunities. The present rapid urbanization in the outskirts of DKI Jakarta is considered as the spill over of the population that is attracted by DKI Jakarta.

The population framework of 12 million in the DKI Jakarta Structure Plan 2005, implies that DKI Jakarta cannot afford to prepare urban infrastructure and services required for a population of more than 12 million and that the population spill-over from DKI Jakarta should be settled outside of DKI Jakarta.

Therefore, the urban structure planning should not be confined within the DKI Jakarta boundary, but should be extended with the most suitable development measures to the preferable urban development area beyond the boundary.

ECONOMIC ACTIVITIES

The economic potentials of DKI Jakarta can not be compared with other regions. There exist many advantages in business and job opportunities, easier access to supporting industries, services, information, communication and so on. Because of these advantages, people and industries will continue to concentrate to DKI Jakarta. However, such a continuous trend of concentration will surely corrupt social stability, economic efficiency and urban environments.

The past development of industries along the regional corridors were due to the good accessibility to Jakarta, which was provided by the regional roads and tollways. The Botabek region does not have its own independent advantages in this respect, outside of being adjacent to Jakarta.

The existing accumulations of urban facilities and economic activities in the Botabek region are too poor to induce the economic development needed to achieve the decentralization of job opportunities from DKI Jakarta. Therefore a strategic plan utilizing the economic potentials of DKI Jakarta will be an important matter for promoting economic activities in the Botabek region.

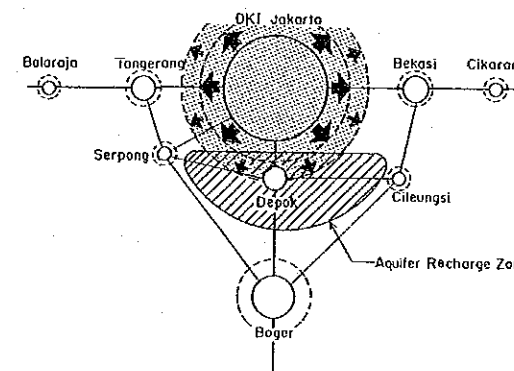
It is essential for such a megalopolis as Jakarta to have the basic industries required to create a sufficient number of formal jobs to accommodate the increasing population. Although the jobs in the manufacturing sector increased notably in the 1970's, Jakarta has predominantly relied on the trade/service and government sectors for employment creation. Since the formal job supply by the trade/service and government sectors is considered to be insufficient in the future, the development of the manufacturing industry is a key to solve this problem.

ALTERNATIVE REGIONAL DEVELOPMENT PATTERNS

Based on the prime policy of decentralization of urban settlements and economic activities from DKI Jakarta, alternative regional development patterns are compared as follows:

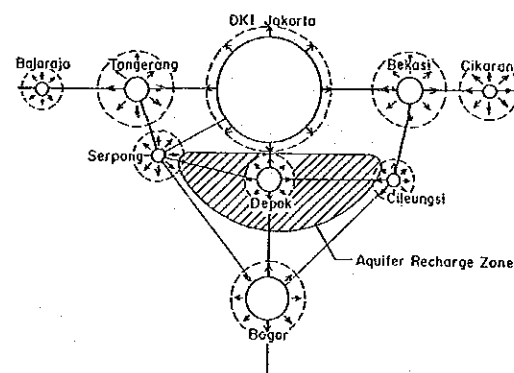
1) Concentrated Growth with Urban Expansion

This alternative expands the urban area outside of Jakarta, but the major economic activities would still be located in the centers of DKI Jakarta.



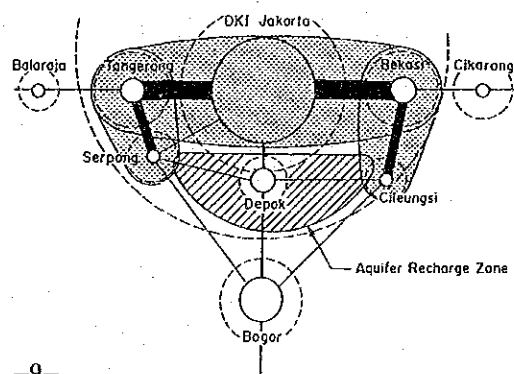
2) Formulation of Self-Sustainable Cities Outside Jakarta

This alternative aims at formulating self-sustainable cities with relatively higher levels of independence from other cities.



3) Formation of Jakarta Metropolitan Area

This alternative aims at formulating the Jakarta Metropolitan Area within a 30 km radius. The metropolitan area has one metropolitan center and several sub centers.



The First Alternative depends much on Jakarta's development potentials and takes advantage of the integration of urban facilities and functions. This pattern is a trend type model and it is likely to promote a highly dense population in the existing urban area and an urban sprawl with insufficient infrastructures. Therefore an exceeding amount of burden is put on the existing facilities and consequently the urban and natural environments will deteriorate.

The Second Alternative aims at decentralizing Jakarta's increasing population to sub-regional centers around DKI Jakarta. These core cities are planned to be self-sustainable providing both settlement and economic activities within the city areas. Consequently, it is not a requirement to secure high mobility between Jakarta and these self-sustainable cities to form this development pattern. This alternative does not aim at utilizing the existing growth potentials of DKI Jakarta.

The Third Alternative aims at formulating a metropolitan area within a 30 km radius (one hour travel time), where high mobility is secured between outlying activity centers and the Central Area of Jakarta. This alternative intends to make the best use of the existing urban accumulations and potentials of Jakarta in order to decentralize urban settlements, economic activities and urban functions from Jakarta. The development of self-sustainable cities with a higher level of independence from Jakarta are encouraged outside of the metropolitan area.

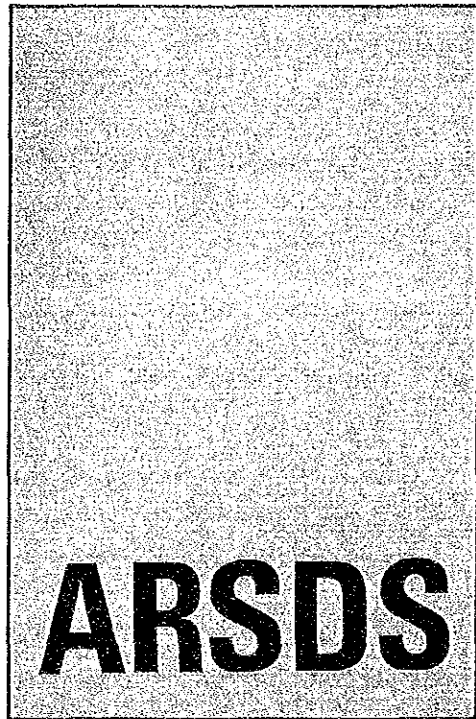
SELECTED REGIONAL DEVELOPMENT PATTERN

The Third Alternative, Formation of Jakarta Metropolitan Area, was selected based on the basic criteria of "Efficiency", "Equity" and "Environment". The most important point in the selection is the possibility of decentralizing urban settlements, economic activities and urban functions from Jakarta. If this prime policy of decentralization is not achieved, almost all of the development objectives cannot be achieved.

The first alternative is the existing trend, which cannot solve the existing various urban problems, much less the future problems. The second alternative is too idealistic and optimistic in the formulation of self-sustainable cities, which in general require huge public investments in advance for urban infrastructure and services, since self-sustainable cities first need both employment and residences within the cities. The government cannot create enough jobs by itself and attract private companies without good incentives. Moreover this formulation of self-sustainable cities is too difficult under the direct area of influence of DKI Jakarta within a 30 km radius of Jakarta.

What are the good incentives for decentralization for economic activities and residents? The Third Alternative provides answers this question.

C.2 REGIONAL DEVELOPMENT SCENARIO



In a perspective longer than 40 years, the regional development scenario can be categorized into the two following ways:

- 1) Formation of the Jakarta Metropolitan Area within a 30 km radius by developing the East-West Axis to induce development of activity centers and housing. In this context, the Tangerang, the Bekasi, the East and the West centers are placed as the growth centers.
- 2) Reformation of the Jabotabek Regional Structure within a 50 km radius by promoting the development of high level self-sustainable core cities outside of the 30 km radius.

The first one should be tackled from now on and the second one should follow the first one in the future, as shown in Fig. 13.

In the distant future, the Jabotabek Region will face the selection of the regional development policy in the context of national development.

At present Indonesia adopts the decentralization policy for not only Jakarta but also for large cities throughout the country because the country is composed of many islands and the population is derived from many tribes with different values. However if Indonesia emphasizes the urban development throughout the country, the potential of the belt area in the regional corridors can be utilized by promoting the Ladder Pattern Development as schematically shown in Fig. 14.

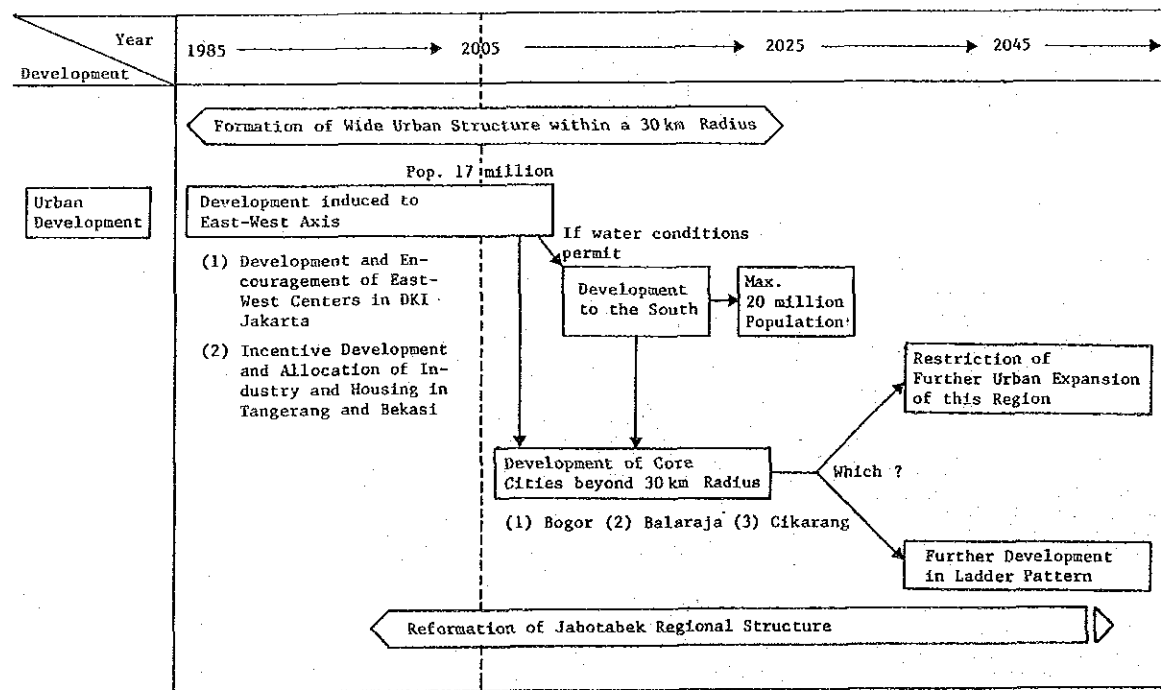


Fig. 13 REGIONAL DEVELOPMENT SCENARIO

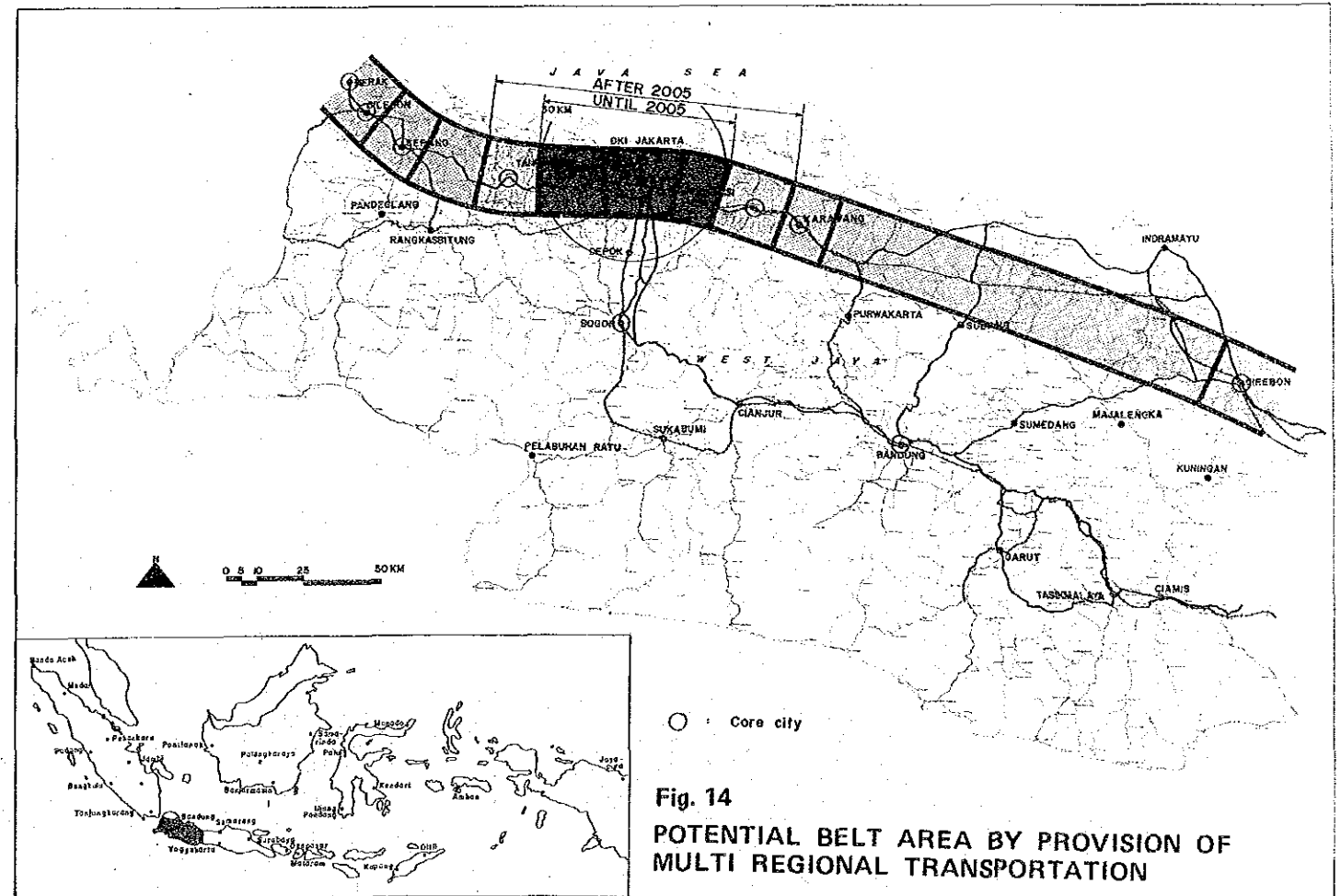
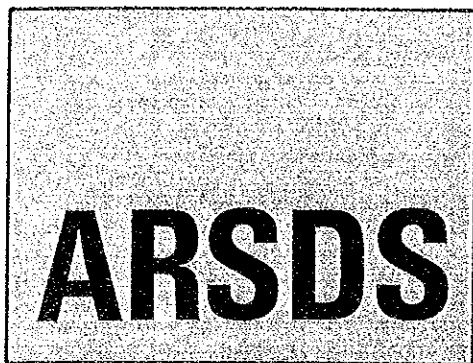


Fig. 14 POTENTIAL BELT AREA BY PROVISION OF MULTI REGIONAL TRANSPORTATION

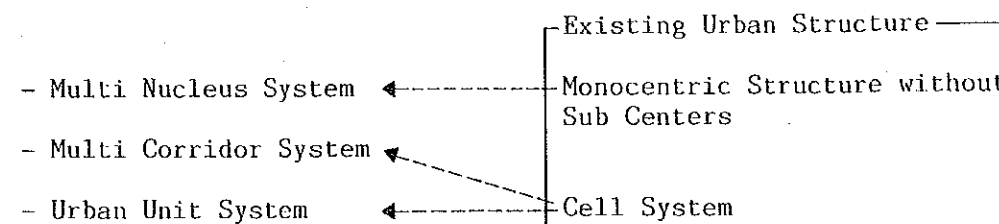
D PLANNING STUDY
D.1 STRATEGIC URBAN STRUCTURE



In order to achieve the development objectives, an urban structural change is required so as to put the following prime policies into action:

- Decentralization of urban settlements, economic activities and urban functions from Jakarta
- Establishment of the major role of mass transportation

The strategic urban structure equipped with the following three systems is recommended against the existing urban structure:



RECOMMENDED STRATEGIC URBAN SYSTEMS

Considering how to concretize the Jakarta Metropolitan System development following the development objectives and basic criteria, the ARSDS Team proposes the strategic urban structure equipped with the following three systems:

- Multi Nucleus System
- Multi Corridor System
- Urban Unit System

MULTI NUCLEUS SYSTEM

The decentralization of urban settlements, economic activities and urban functions is understood as the prime policy for the Jakarta Metropolitan System. In the recommended regional development strategies, the commercial and business sector is considered to play the major role in establishing the Jakarta Metropolitan Area by decentralization of their activities.

In the present situation, however, the mono-centric concentration is still dominant, and the ribbon development of commerce, business, service and administrative functions along large streets in the highly urbanized area is increasing this concentration, which causes the traffic congestion not only in the Central Area, but also on the radial streets in the suburban areas.

The decentralized economic activities and urban functions from the Central Area are recommended to be accommodated and concentrated in some of the activity centers in the suburban areas to achieve the following:

- To reduce the mono-centric concentration of economic activities in the Central Area
- To relieve the traffic problems, such as congestion concerning the functional concentration in the Central Area
- To efficiently provide infrastructure to support the activities of centers
- To accommodate the social and public service facilities for the increased population in the hinterland of each activity center

In this sense, the urban structure consisting of the metropolitan center in the Central Area and several activity centers in the suburban areas, the so-called Multi Nucleus System, should be formed to promote the prime policy of decentralization. In order to establish the Multi Nucleus System, activity center development should be emphasized. On the other hand, the conventional ribbon development is considered as supplementary.

MULTI CORRIDOR SYSTEM

The basic problem with the existing road and street network in developing the Multi Nucleus System in the Jakarta Metropolitan Area is the lack of arterial streets and their Cell System network.

Because this Cell System is still the basic street network in the Jakarta Metropolitan Area, there are many different traffic congestions and jams, especially around activity centers. This forms obstacles for the growth of activity centers.

In order to efficiently induce the Multi Nucleus System, the Multi Corridor System, consisting of multiple transportation corridors such as major arterial streets, minor arterial streets, regional roads, medium/mass transportation, etc., is required with the following functions:

- The system gives the outlying activity centers direct accessibilities to the Central Area
- In order to promote activity centers, the system gives accessibilities between activity centers and their hinterlands
- The system enables installation of mass transportation on the separated right-of-way
- The system achieves differentiation of street functions, such as goods and person movement, individual and mass transportation, local and through traffic, etc.

The ARSDS Team proposes the Multi Corridor System as a strategic system which would reinforce and overcome the existing Cell System network, induce dynamism to form the Multi Nucleus System, and provide the open flexibility necessary for population growth and urban expansion toward the year 2005 and thereafter.

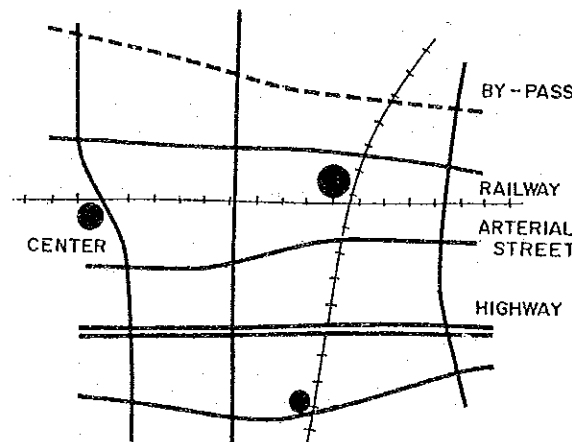


Fig. 15 MULTI CORRIDOR SYSTEM

URBAN UNIT SYSTEM

At present, with some exceptions such as in Menteng, Kebayoran Baru, Bintaro, etc., the urban areas are not composed of urban units enclosed by arterial streets. The residential areas in the Central Area are occupied by urban kampungs that are not provided with adequate collector streets. In the suburban areas, housing complexes are developed relying on existing rural roads. These trends are the result of, and help perpetuate, the lack of planned urban infrastructures, such as collector streets, open space, public facilities, etc. Moreover, the loose development spreads in the suburban areas, and consequently efficient land utilization cannot be achieved. Commercial and business areas in the Central Area take the form of ribbon along large streets, but do not take the block form because the pitch of arterial streets is too long to form a block for commercial and business activities.

The adoption of the urban unit system, by providing enough arterial streets to shorten the pitch, is required to achieve the following:

- To give a development framework to improve the environment by the urban unit
- To give a guideline for housing development by the urban unit, in order to achieve a high utilization of land
- To enable the systematic approach to the provision of collector and local streets by the urban unit
- To eliminate through traffic from the urban unit
- To facilitate a block-wise development in activity center areas

An urban unit is composed of following two different systems:

- External System: Arterial streets surrounding the urban unit
- Internal System: Collector and local streets being surrounded by arterial streets

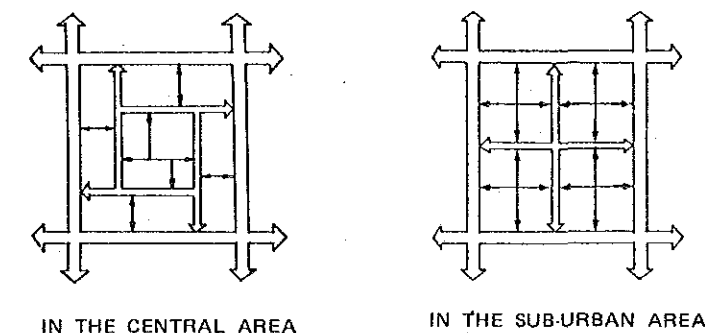
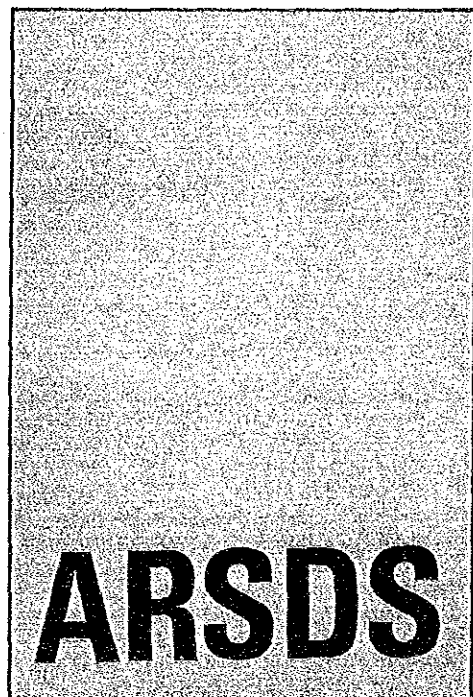


Fig. 16 URBAN UNIT SYSTEM



The following three physical key developments are effective measures to form the strategic urban structure combined with the Multi Nucleus System, the Multi Corridor System and the Urban Unit System:

- Activity Center Development
- Arterial Street Development
- Mass Transportation Development

These three developments are required to be carried out in close interrelation, and these interrelated developments compose the urban development strategy to establish the Jakarta Metropolitan Area.

RECOMMENDED URBAN DEVELOPMENT STRATEGY

- Formation of the east-west development axis, consisting of the mass transportation and major arterial streets connecting activity centers, in order to induce activity center developments and housing developments in the axis
- Establishment of the east-west transportation in the Central Area, which allows the decentralization of economic activities and urban functions, and which enables up-grading of urban functions in the Central Area in the long run
- Encouragement of compact development around activity centers in the southern limited development zone, by keeping the transportation network to the zone as the Cell System

RECOMMENDED URBAN DEVELOPMENT STRATEGY

The following urban development strategy for the Jakarta Metropolitan Area is recommended:

- Formation of the east-west development axis, consisting of the mass transportation and major arterial streets connecting activity centers, in order to induce activity center development and housing developments in the axis
- Establishment of east-west transportation in the Central Area, which allows the decentralization of economic activities and urban functions, and which enables up-grading of urban functions in the Central Area in the long run
- Encouragement of compact development around activity centers in the southern limited development zone by keeping the transportation network to the zone as the Cell System

By reviewing the strategic urban systems described in the previous section more concretely and physically in the Jakarta Metropolitan Area, the ARSDDS Team came to following three physical key development issues which are effective incentives for urban development:

- Activity Center Development
- Arterial Street Development
- Medium/Mass Transportation Development

These three developments are required to be carried out in close interrelation in order to form the strategic urban structure combined with the Multi Nucleus System, Multi Corridor System and Urban Unit System. These interrelated developments compose the urban development strategy to establish the Jakarta Metropolitan Area.

ACTIVITY CENTER DEVELOPMENT

For activity center development, close attention should be paid in the following ways to both the activity center itself and the urban infrastructure supporting it:

- Adequate allocation of activity centers in the multi nucleus form in consideration of their areas of influence
- Supply of sufficient land to accommodate work places, urban functions and urban infrastructure in activity centers
- Encouragement of the allocation in activity centers of urban functions such as government offices, high education facilities, large hospitals, recreation facilities, etc.
- Allocation of work places and urban functions within walking distance to promote the usage of medium/mass transportation in consideration of pedestrians in activity centers
- Encouragement of block development to achieve high land utilization
- Provision of direct accessibilities from the activity centers to the Central Area through medium/mass transportation and major arterial streets in order to encourage activity center development
- Provision of arterial streets around activity centers to form urban units for the center area and to serve the residential areas surrounding activity centers

ARTERIAL STREET DEVELOPMENT

The development of arterial street must be coordinated with the following guidelines and related developments:

- Provision of major arterial streets with direct accessibilities to the Central Area from Activity centers in the suburban areas in order to encourage activity center development

- Provision of major and minor arterial streets connecting activity centers with their hinterlands in order to promote housing development in the suburban areas
- Provision of arterial streets accessing to the medium/mass transportation to promote its usage
- Increase the density of arterial streets to form urban units which facilitate systematic preparation of collector street

MEDIUM/MASS TRANSPORTATION DEVELOPMENT

The medium/mass transportation should have a separated right-of-way in order to play the major role in providing adequate transportation services in a megalopolis such as the Jakarta Metropolitan Area. The medium/mass transportation on the separated right-of-way takes the form of a corridor. In this sense, the axis development in the Multi Corridor System is suitable to induce the activity centers in the Multi Nucleus System. The Medium/Mass Transportation Corridor should be provided in coordination with the following related developments:

- To connect several activity centers on the Medium/Mass Transportation Corridor to the Central Area in order to induce activity center development
- To have a joint right-of-way of medium/mass transportation and arterial streets in order to strengthen the ability of inducing urban development along the corridor
- To provide adequate transfer facilities such as station plazas
- To provide arterial streets accessing to the medium/mass transportation corridors in order to form urban units and to induce housing developments relying on the medium/mass transportation

METROPOLITAN CENTERS

The Metropolitan Centers are the activity centers whose accumulations of administration, commerce and business have wider influences beyond the mere local service to the whole Jakarta Metropolitan Area and Indonesia. Two centers which are in this category are:

- Kota (mainly commerce and business functions)
- Monas (mainly public administration functions)

Kota has played the central role in the historical development of Jakarta. The commercial and business functions are still concentrated mostly in Kota and its influence is still expanding. Today the accumulation is not confined around Glodok alone, but expands along Jl. Gajah Mada/Hayam Wuruk and Jl. Mangga Besar. The former Lokasari is planned to be re-developed as a new commerce and business area in future.

The area around Monas has the function of nation wide administration with concentrated governmental facilities. Mixed in with them are also quite a few private business facilities. To the east of Monas, in Banteng, many new buildings are being built at the moment.

SUB CENTERS

The ARSDS team proposes the following eight Sub Centers according to their administrative functions, such as Walikota and Kabupaten Offices, the city hierarchy in the Jabotabek Development Plan 2005 and the existing and future commercial and business accumulations.

- New East Center (Jakarta - Timur)
- New West Center (Jakarta - Barat)
- Blok M (Jakarta - Selatan)
- Tanjung Priok (Jakarta - Utara)
- Tangerang
- Bekasi
- Serpong
- Depok

In order to support the decentralization policy of the working places, it is important to enrich the administrative, commercial and business facilities. By developing the public facilities with cultural, educational, social, medical and recreational functions, sufficient local service for the demand of the residents should also be achieved in the suburban area and the Botabek Region. Sufficient land space for their long term prospect should be provided from the beginning. By developing multi-use activity centers which can fulfill various demands of the residents, trip concentration to Jakarta, other than commuting trips, can be reduced.

SECONDARY CENTERS

The ARSDS team proposes the following eighteen Secondary Centers which should reinforce the Metropolitan Centers in the Central Area and the Sub Centers in the suburban area and Botabek Region, by primarily providing commercial and business services.

- | | | |
|----------------|-----------------|-----------------|
| - Senen | - Pondok Gede | - Cileungsi |
| - Tanah Abang | - South Bekasi | - Tambun |
| - Manggarai | - Kebon Jeruk | - Ciputat |
| - Jatinegara | - Jati Uwung | - Bantar Gebang |
| - Pondok Bambu | - North Legok | |
| - Pasar Minggu | - North Serpong | |
| - Pulogadung | - Cileduk | |

The Secondary Centers above are based on the criteria of equity, in that the residents living in every T.S.Z. should be given sufficient local services. According to the T.S.Z. and the population forecast for 2005, the Secondary Centers are designed to serve around half a million to one million people. Furthermore, the design of the Sub and Secondary Centers are based on the idea that the maximum distance between the centers should not exceed 5 km.

