1.4.1 PRESENT LANDUSE IN JABOTABEK

GENERAL DESCRIPTION

The area of the Jabotabek Region, comprising DKI Jakarta, three surrounding kabupatens and one kotamadya, is 672,300 ha, which is about ten times larger than DKI Jakarta. According to the Landsat data taken in August 1982 and the reconnaissance of the Study Team, the current landuse situation in the Jabotabek Region is as follows:

- Generally speaking, the Jabotabek Region as a whole is characterized by rural landuse, except for DKI Jakarta
- The predominant landuse in the Jabotabek Region is agricultural, which is composed of irrigated rice fields in the northern flat areas and dry fields in the southern areas
- The majority of the urban area is concentrated in DKI Jakarta, and the rest is mostly concentrated in such sub-regional centers as Tangerang, Bekasi and Depok
- Large scale manufacturing is located along the major roads connecting Jakarta to other towns such as Tangerang, Bekasi and Bogor
- Rural villages (rural kampung), where people live mainly on agriculture, are dispersed in the extensive agricultural land

URBAN LANDUSE IN BOTABEK

Table 1.4.1 shows the result of the Landuse Survey conducted in the surrounding towns of DKI Jakarta. The comparison of data between Tables 1.4.1 and 1.4.2 shows that the urbanization in these towns was mainly caused by housing and industrial development. On the other hand, the commercial and business areas were developed far behind that of DKI Jakarta.

Table 1.4.1 URBAN LANDUSE IN THE SURROUNDING TOWNS

Landuse	Kotif. Tangerang	Kotif Bekasi	Kotif. Depok	Kec. Ciputat	Kec. Pd. Aren	Kec. Serpong
Planned Housing	637 (3.6%)	647 (6.7%)	536 (8.2%)	283 (4.6%)	131 (4.6%)	184 (1.9%)
High Density Kampung	459 (2.6%)	65 (0.7%)	226 (3.5%)	102 (1.7%)	-	-
Commerce & Business	44 (0.2%)	29 (0.3%)	43 (0.7%)	31 (0.5%)	-	5 (0.1%)
Government & Public Facilities	155 (0.9%)	120 (1.2%)	145 (2.2%)	95 (1.6%)	26 (0.9%)	301 (3.1%)
Industry	911 (5.2%)	210 (2.2%)	63 (1.0%)	34 (0.6%)	-	20 (0.2%)
Others	15,472 (87.5%)	8,557 (88.9%)	5,530 (84.4%)	5,574 (91.4%)	2,712 (94.5%)	9,197 (94.7%)
T o t a l	17,678 (100%)	9,628 (100%)	6,543 (100%)	6,119 (100%)	2,869 (100%)	9,707 (100%)

Source: Botabek Landuse Survey conducted by the Study Team in 1986

1.4.2 PRESENT LANDUSE IN DKI JAKARTA

RESIDENTIAL AREA

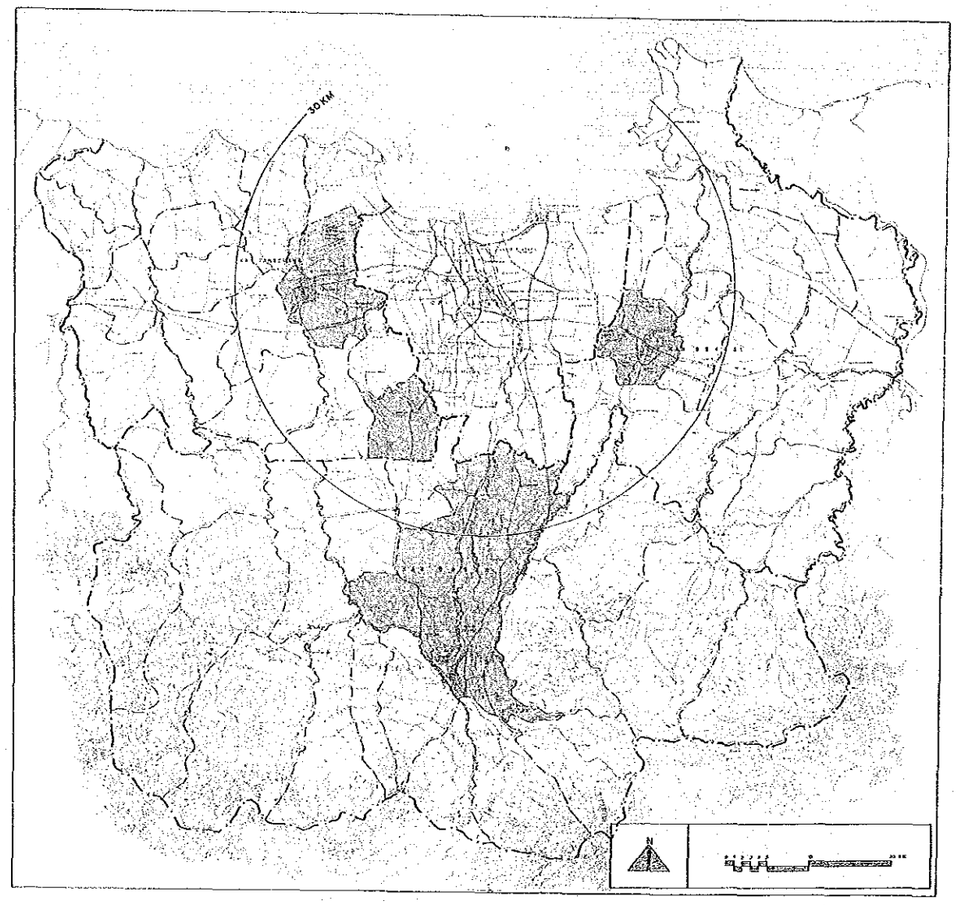
The Jabotabek Region had a population of about 12 million and an average population density of less than 20 persons/ha in 1980. However there is a large difference in the population density between the urbanized areas and rural areas. As shown in Fig. 1.4.2, the population density within a 5 km radius of the Monas Monument is more than 200 persons/ha. Areas with more than 300 persons/ha can also be found in this area. Highly urbanized areas with more than 100 persons/ha spread within a radius of 9 km. Surrounding the highly urbanized area are areas with more than 50 persons/ha which expand to the south, east and west. The expansion to the south is not smaller than those to the east and west. The areas with more than 20 persons/ha within a 30 km radius are shown in Fig. 1.4.1.

The areas with more than 300 persons/ha are mostly covered by densely populated spontaneous settlements, and these are called urban kampungs. These urban kampung areas are located near places which have good accessibility to urban job opportunities at the existing commercial centers such as Kota, Senen, Tanah Abang, etc. These urban kampung areas have absorbed the low and middle income population and have expanded their areas to outside of the Central Area. The urban kampung areas account for about 33% of the total residential areas in DKI Jakarta. From the 1970's the Kampung Improvement Projects have improved the residential environment in the areas shown in Fig. 1.4.4. This figure shows that the urban kampung areas spread widely around the Central Area. This is one of the major characteristics of the existing urban structure.

Table 1.4.2 LANDUSE IN DKI JAKARTA, 1985

Landuse	(ha)	%
Planned Housing Area	8,889	13.7
High Density Urban Kampung	11,071	17.1
Low Density Rural Kampung	13,373	20.6
Commercial & Business	1,847	2.9
Industry & Warehouse	3,925	6.1
Government Facilities	1,231	1.9
Education & Public Facilities	1,447	2.2
Park & Cemetery	1,320	2.0
Agriculture & Open Space	17,600	27.1
Transportation Facilities	1,931	2.9
Swamp, River & Pond	2,244	3.5
Total	64,878	100.0

Note: All the area has been estimated from the analysis of aerial photographs taken in 1982 and from the Landuse Survey conducted by the Study Team in 1985

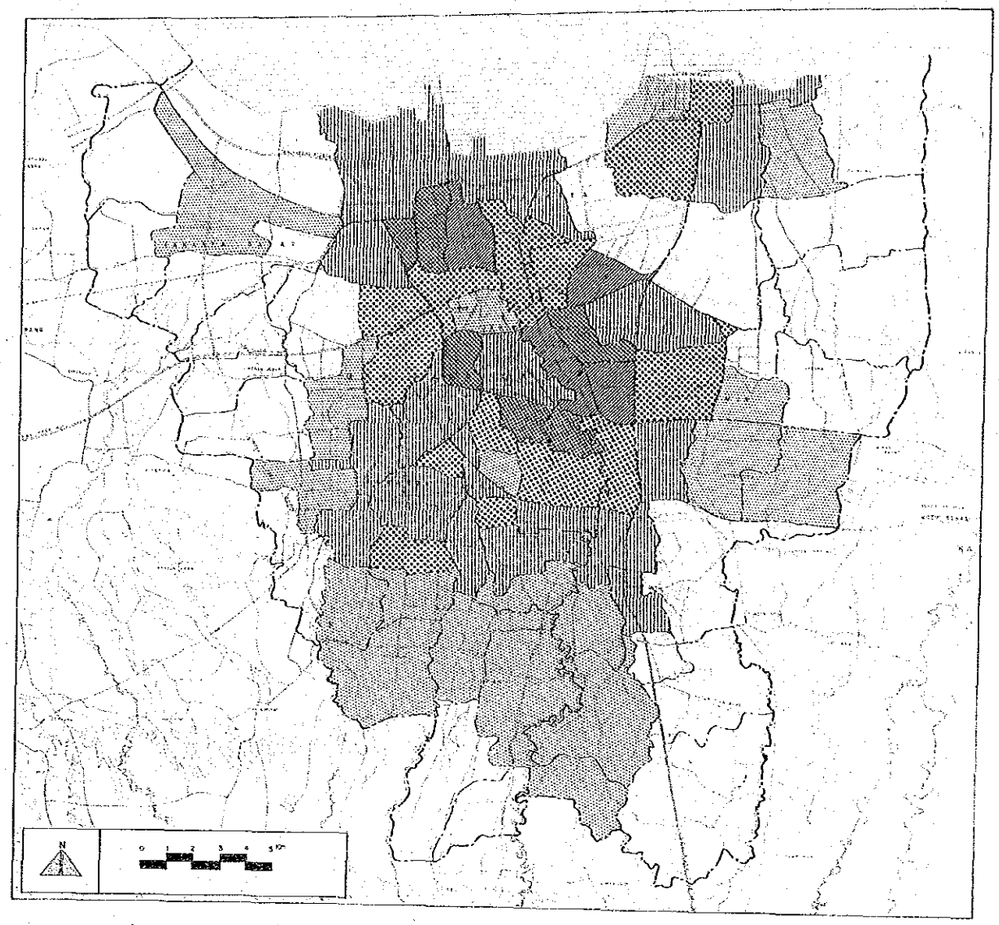


LEGEND

over 20 persons/ha

SOURCE : POPULATION CENSUS, 1980

Fig. 1.4.1 POPULATION DENSITY IN BOTABEK, 1980



LEGEND

OVER 400 persons/ha
300 - 399
200 - 299
100 - 199
50 - 99
20 - 49
UNDER 20 persons/ha

SOURCE : POPULATION CENSUS, 1980

Fig. 1.4.2 POPULATION DENSITY IN DKI JAKARTA, 1980

Fig. 1.4.3

LANDUSE MAP OF DKI JAKARTA, 1985

- Planned Housing Area
- High Density Urban Kampung
- Low Density Rural Kampung
- Industry & Warehouse
- Commercial & Business
- Education & Public Facilities
- Government Facilities
- Park & Cemetery
- Agriculture & Open Space
- Swamp, River & Pond
- Transportation Facilities

SOURCE : ARSDS LANDUSE SURVEY

N

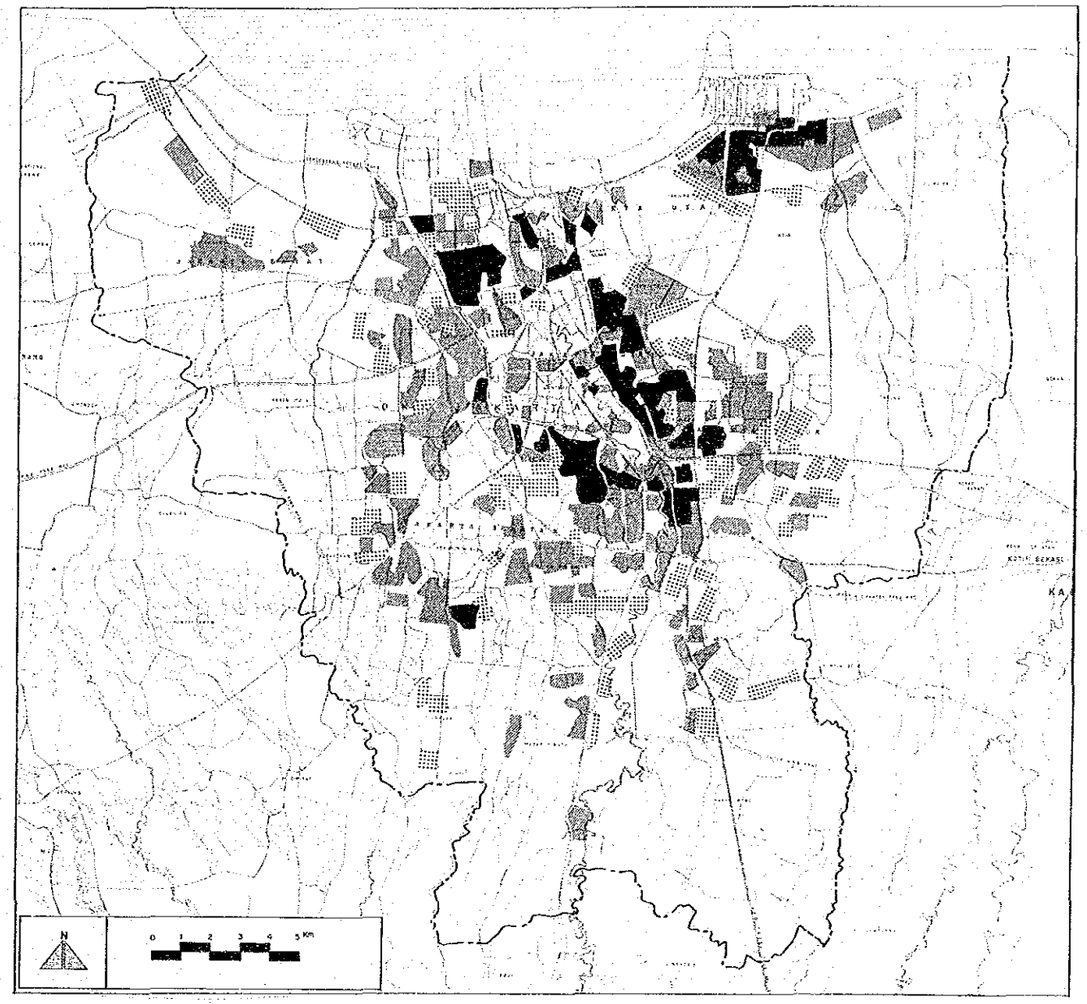
0 1 2 3 4 5 Km

ARTERIAL ROAD SYSTEM DEVELOPMENT STUDY IN JAKARTA METROPOLITAN AREA

On the other hand, the rural kampungs are the spontaneous settlements with low population densities which were originally formed on the basis of agriculture. The rural kampung areas spread widely from the suburban areas of DKI Jakarta to Botabek. However, following the urbaniziation of DKI Jakarta, rural kampung areas absorbed in-migrants, which increased their population density. This prevails in the rural kampungs in Botabek, which are within a 30 km radius from the Monas Monument.

The planned housing areas for the middle upper classes such as Perumnas housing and private estate housing cover about 30% of the total residential areas of DKI Jakarta. The area of this type of housing ranges from several houses to an area of 500 hectares. Two-thirds of the planned housing area is located in the suburban area outside of the area enclosed by the South-West By-pass and the North-South By-pass. The remarkable increase in planned housing areas has recently occurred as described in Section 1.4.4.

About 47,000 units of public housing were constructed by the National Urban and Housing Development Cooperation (Perumnas) between 1975 and 1983. However this supply was far less than the demand of the increased population. Moreover, because of the difficulty of land aquisition in DKI Jakarta, about 80% af these houses were constructed in Botabek. Overall almost all the houses are one or two-story. Middle or high rise apartment houses hardly exist in DKI Jakarta.



LEGEND

- COVERAGE IN PELITA I
- COVERAGE IN PELITA II
- COVERAGE IN PELITA III

Source : Peta Lokasi Proyek MHT DKI Jakarta.

Fig. 1.4.4 LOCATION OF KAMPUNG IMPROVEMENT PROJECTS IN DKI JAKARTA

COMMERCIAL AND BUSINESS AREA

The major accumulations of commercial and business functions are concentrated as follows:

- Regional trade function at Kota, adjacent to the ex-main port of Jakarta (the Sunda Kelapa Port)
- Government administration function around the Monas Monument
- Modern business office buildings along large streets such as Jl. Thamrin and Jl. Sudirman
- Modern commercial function at Blok M

These accumulations form the strong north-south axis which was historically developed.

In addition to these accumulations, government office buildings and modern business office buildings are located along the large streets in the urbanized area.

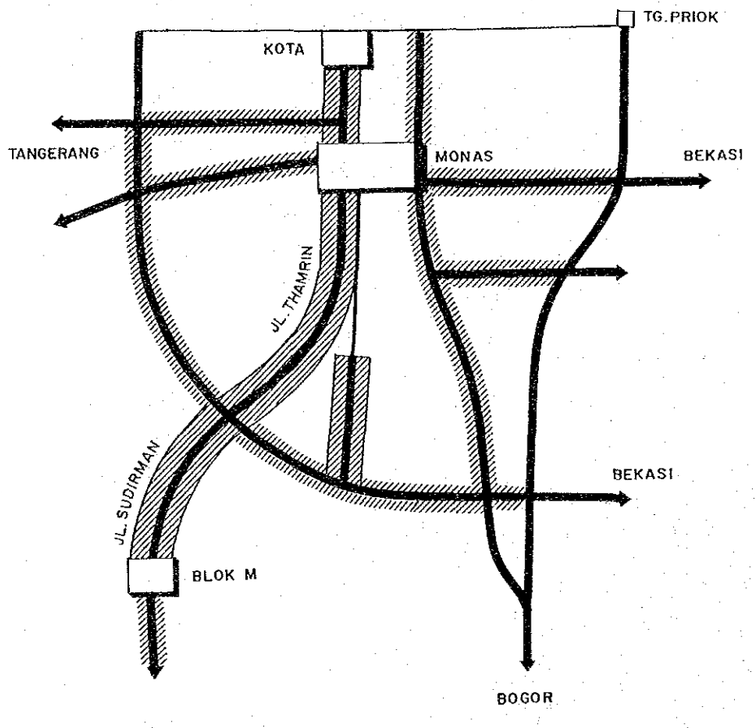


Fig. 1.4.5 EXISTING STRONG NORTH – SOUTH AXIS

On the other hand, the existing centers based on the traditional markets (pasar) are generally small in size and are not of the high rise type, except for in Kota and Blok M, as shown in Table 1.4.3.

Table 1.4.3 EXISTING CENTERS

Name	Area by Landuse (ha) Commerce & Service	Government	Total	Floor Area Ratio
Kota	102.2	8.5	110.7	1.6
Senen	17.5	2.9	20.4	1.2
Jatinegara	12.3	2.0	14.3	1.1
Tanah Abang	11.0	4.1	15.1	1.1
Tanjung Priok	4.5	0.4	4.9	0.9
Manggarai	2.8	1.6	4.4	0.8
Blok M	10.9	36.5	47.4	1.5
Total	161.2	56.0	217.2	-

Source : Center Area Survey conducted by the Study Team in 1986

Many daily markets (pasar) are distributed throughout DKI Jakarta and many retail shops are located along arterial streets. The commercial and business areas contained by the existing centers account for less than 10% of the total commercial and business areas. Almost all of the commercial and business activities occur in large buildings along large arterial streets and in small buildings, for common use of commerce and residence, along small arterial streets.

INDUSTRY

The location of industry has been closely related to the accumulation of commerce and business in Kota and to the terminal function of internationl and domestic cargo in Tanjung Priok. Industrial development has occurred along the east and west regional corridors. The existing accumulation at the Pulo Gadung Industrial Estate amounts to about 400 hectares. On the other hand, the Bogor regional corridor to the south has some industrial activities, but further development is limited according to the existing structure plan.

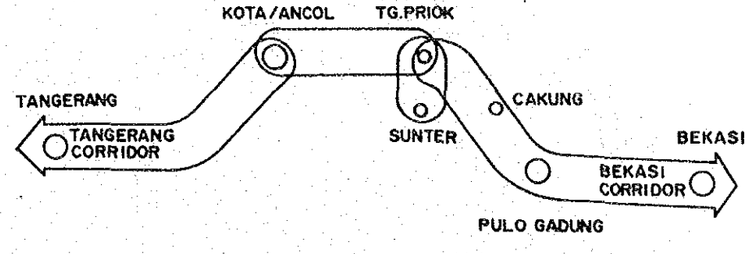


Fig. 1.4.6 SPATIAL DISTRIBUTION OF INDUSTRY

1.4.3 HISTORICAL TREND OF URBANIZATION IN JAKARTA

With the Sunda Kelapa Port on the Ciliwung River, Jakarta was established as a commercial center in the 14th century.

In 1621 the Netherland East-India Company built a fortress at the port protected by moats. The company continued to expand the fortress area until about 1800, when the lowlands suffered from floods. From this time higher lands, such as Senen, Bungur Besar, Tanah Abang and Gambir, were developed for residences.

In the 19th century the urban area continued to expand mostly to the south and southeast (to Jatinegara). The commercial area was developed in the Tanjung Priok Port following its opening. These urban expansions were supported by the construction of a large canal called the "Banjir-Kanal" (Flood Canal), which consists of the western branch to drain the Grogol area and the eastern branch which connects with the Gunung Sahari canal.

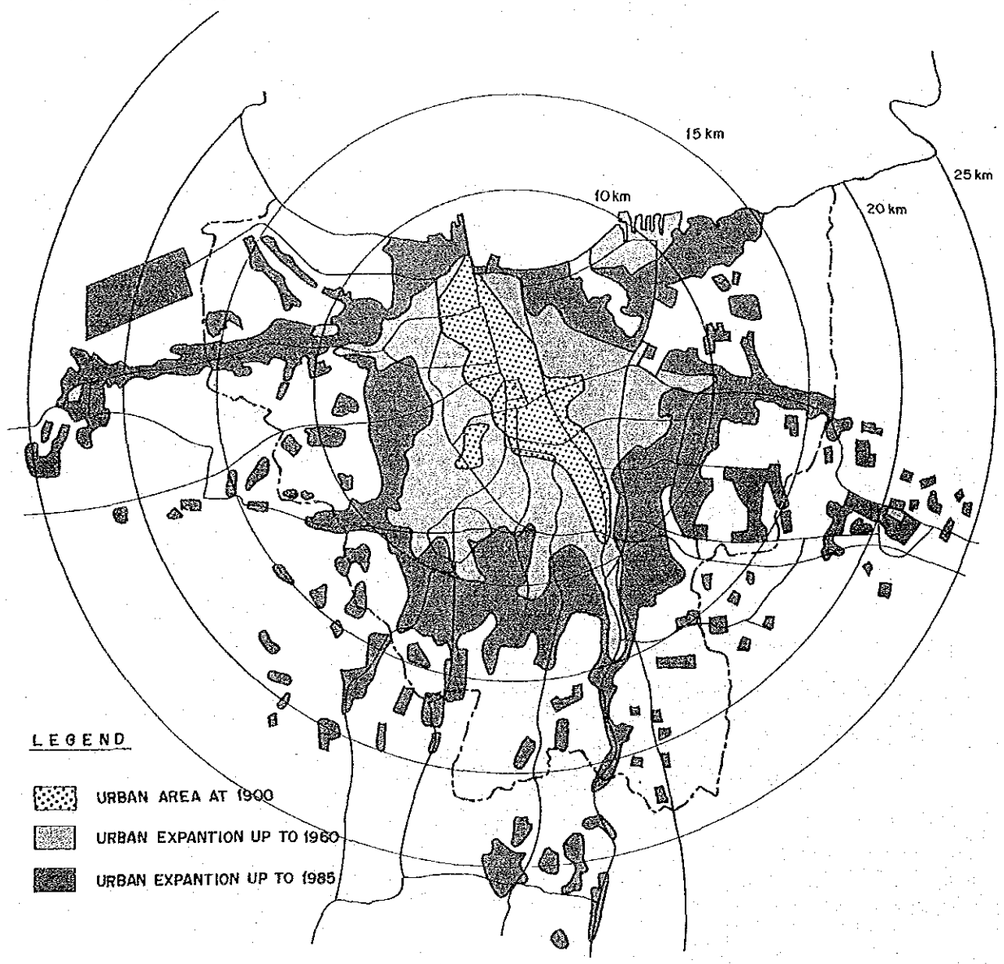


Fig. 1.4.7 HISTORICAL TREND OF URBANIZATION OF JAKARTA

Further growth of Jakarta was in the multi nucleus form with centers of activity, which were not sharply defined, at Tanjung Priok, Pancoran, Glodok, Pasar Ikan, Jatinegara, Tanah Abang, Grogol, Gambir and Senen. These nuclei were interconnected like ribbon. This was the original urban structure of Jakarta before the Independence of the Republic of Indonesia.

Before and after the Asian Games in Jakarta in the 1960s, many large streets such as Jl. Thamrin, Jl. Sudirman, the by-pass between Grogol and Cawang, the by-pass between Tanjung Priok and Cililitan as well as a large residential complex called Kebayoran Baru were constructed. Through these developments Jakarta was changed into a modern capital city and the existing major urban structure was established. However, even after this establishment, the basic characteristics of the urban pattern and road system can be called a cell system, which is based on the rural road network and settlement pattern shown in Fig. 1.4.8.

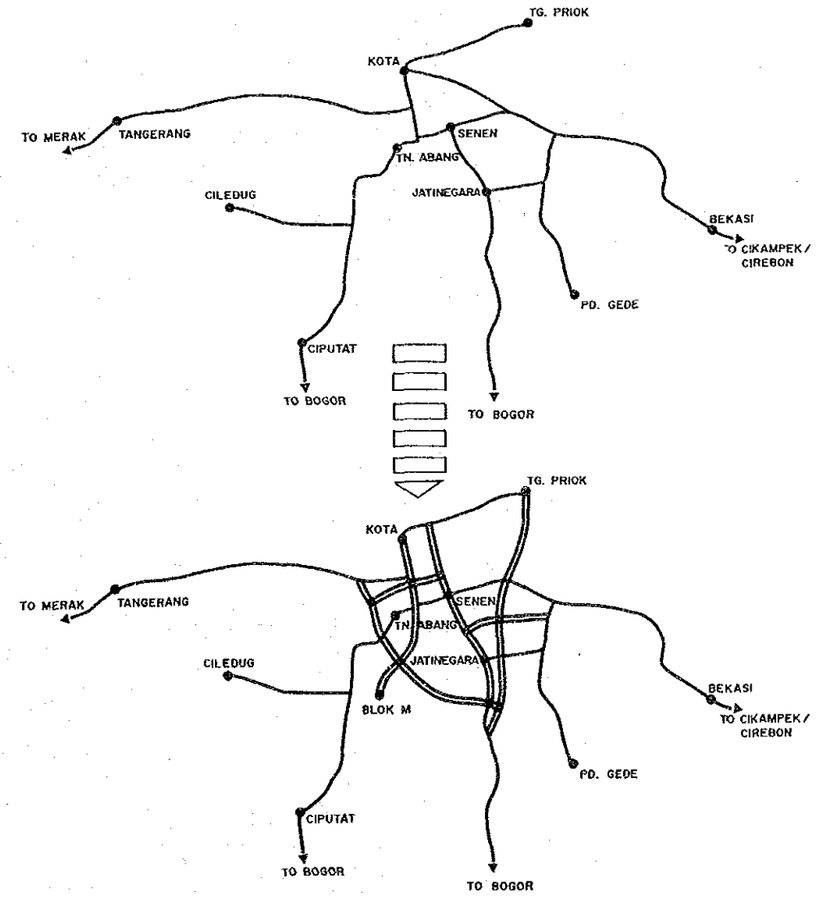


Fig. 1.4.8 TRANSITION OF CELL SYSTEM

1.4.4 RECENT PROGRESS OF URBAN DEVELOPMENT

INDUSTRIAL DEVELOPMENT TREND

The major industrial development occured in the Jabotbek Region in the 1970's. Fig. 1.4.9 shows that the major industrial areas of Pulo Gadung, Sunter, Ancol and Jl. Daan Mogot in DKI Jakarta were developed between 1972 and 1985. The location of these industrial areas are oriented to the regional corridors, the Tanjung Priok Port or the Kota Trade Center.

In Botabek the manufacturing factories are mostly located along the regional corridors. The opening of the Jakarta - Tangerang Freeway in 1984 increased the locational advantages of the Tangerang Regional Corridor, which consequently attracted many manufacturing factories around the freeway.

HOUSING DEVELOPMENT TREND

The housing development in the 1970's relied mostly upon the existing regional corridors and rural roads in the suburban areas of DKI Jakarta and outside of DKI Jakarta. The housing development proceeded extensively in the southern areas where good ground water was available. In 1983 only 42% of the Jakarta residents were supplied with piped water.

However, after the establishment of the restraint development policy in the southern aquifer recharge zone, based on the JMDP study 1980, the applications for housing development in the east and west suburban areas have been remarkable, as shown in Fig. 1.4.10. Except for Serpong, almost all of the approved housing estates in Botabek are the housing estate supported with loans from the National Saving Bank (BTN). These housing developments depend mainly on the existing rural roads.

In this way the suburbanization by housing development is proceeding rapidly in the form of loose spreading sprawl.

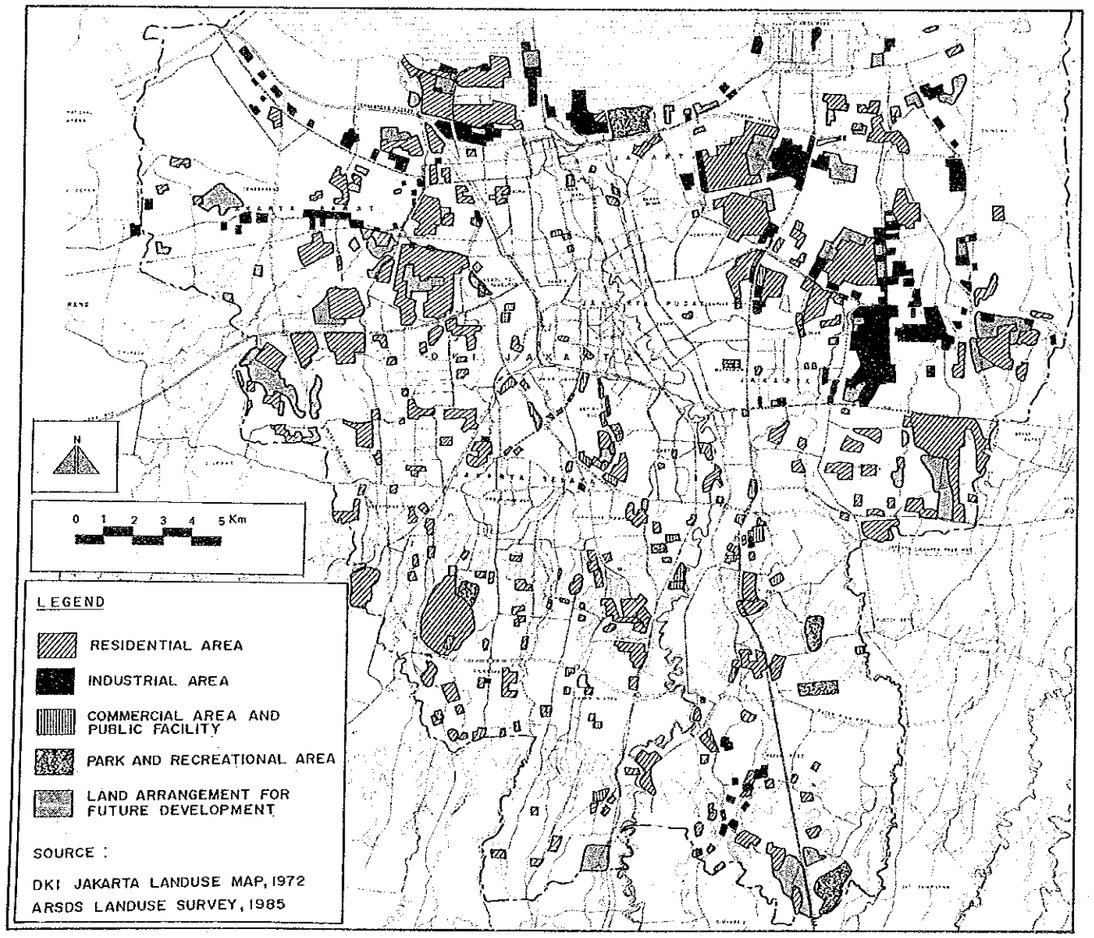


Fig. 1.4.9 DEVELOPED AREA BETWEEN 1972 AND 1985

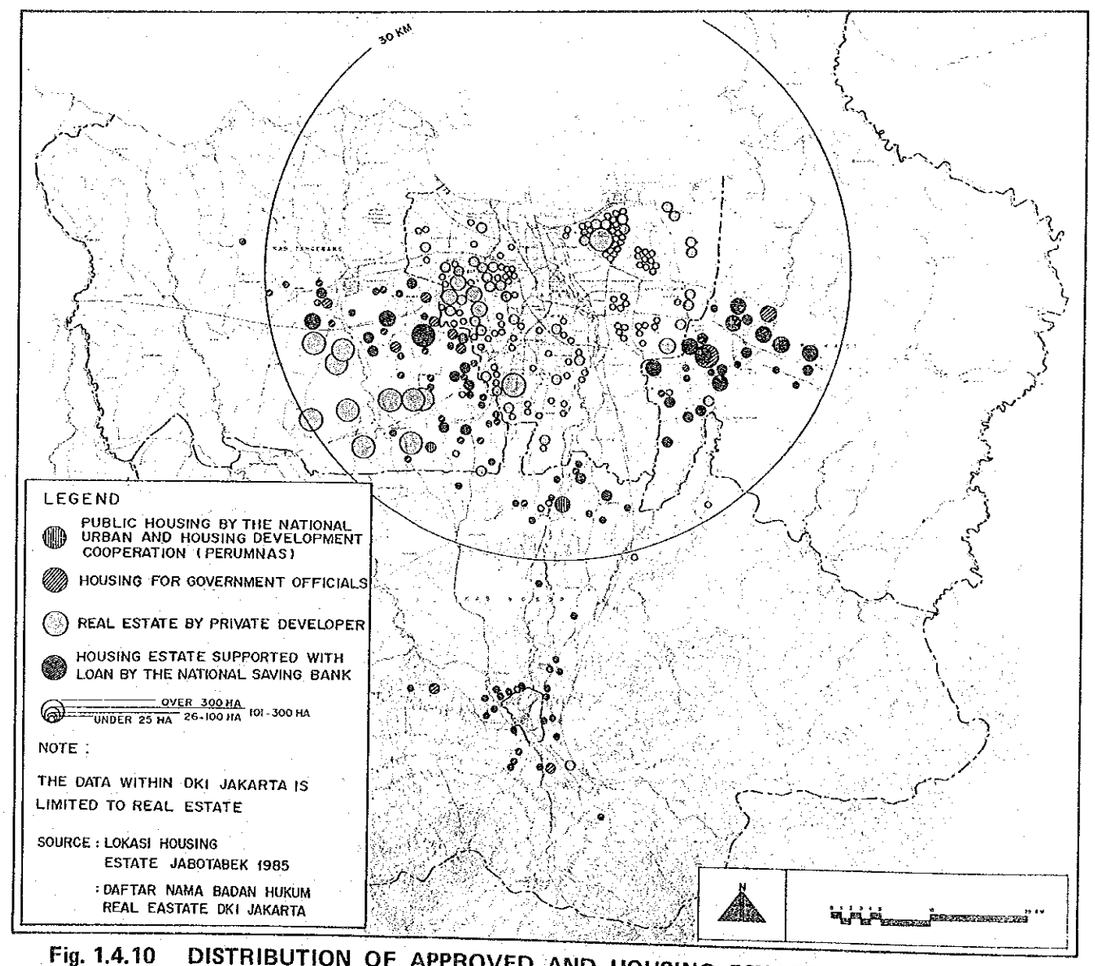


Fig. 1.4.10 DISTRIBUTION OF APPROVED AND HOUSING ESTATES IN JABOTABEK

1.4.5 EXISTING PROBLEMS OF URBAN STRUCTURE

Previously in Section 1.3 it was pointed out from the socio-economic side that the concentration of employment and population is still dominant in Jakarta, but at the same time 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

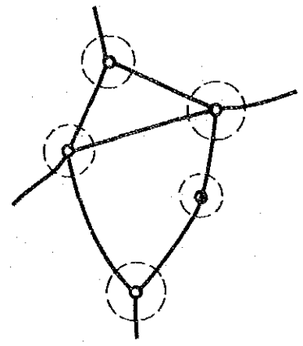
These spontaneous urban developments are also fostered by the existing street network of the Jakarta Metropolitan Area, which the ARSDS team defines as a Cell System.

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.

1.5.1 TRANSPORTATION FACILITIES AND SERVICES

EXISTING ROAD AND STREET NETWORK

Roads and streets are classified into a primary system and a secondary system. The primary system supports inter-city traffic movement and mainly deals with cargo traffic. The secondary system supports intra-city traffic movement. In each system, the roads and streets are classified in detail into artery, collector and local roads, corresponding to their functions which are regulated in the "Law of the Republic of Indonesia, Number 13 of the Year 1980, on Roads". The primary road network in Jabotabek as classified by Bina Marga, Ministry of Public Works is shown in Fig. 1.5.1. DKI Jakarta proposed a road classification within its administrative area in 1984 as shown in Fig. 1.5.2.

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. Bottle necks are seen in many places. Thus, the existing street network in DKI Jakarta doesn't 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 its area was 1,352 km^2. 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. 1.5.3. 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.

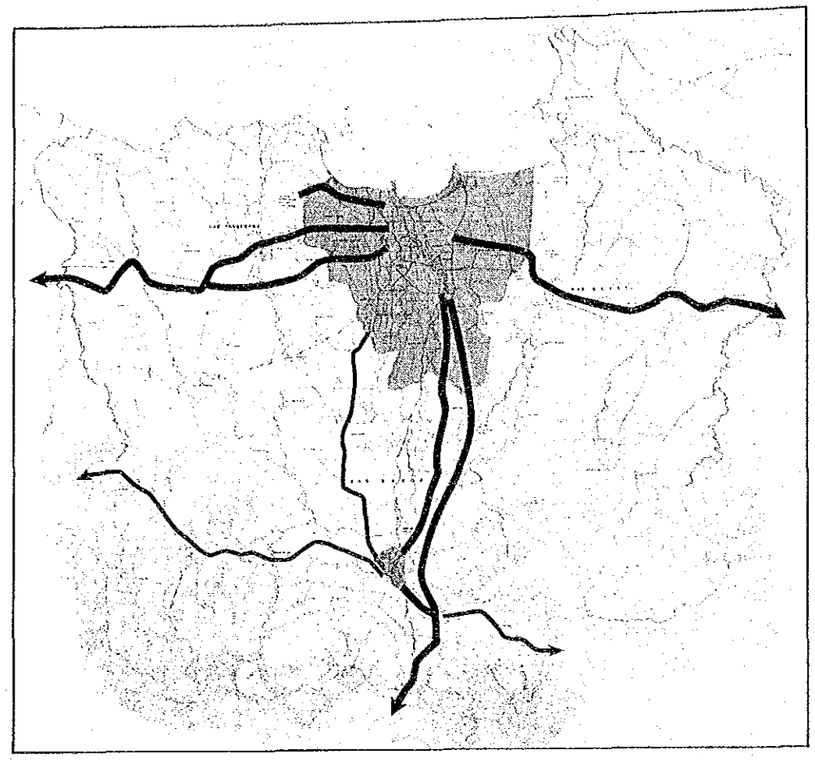


Fig. 1.5.1
ROAD FUNCTIONAL CLASSIFICATION OF PRIMARY SYSTEM

LEGEND

PRIMARY ARTERIAL ROAD
PRIMARY COLLECTOR ROAD
CITY AREA

ARTERIAL ROAD SYSTEM DEVELOPMENT STUDY IN JAKARTA METROPOLITAN AREA

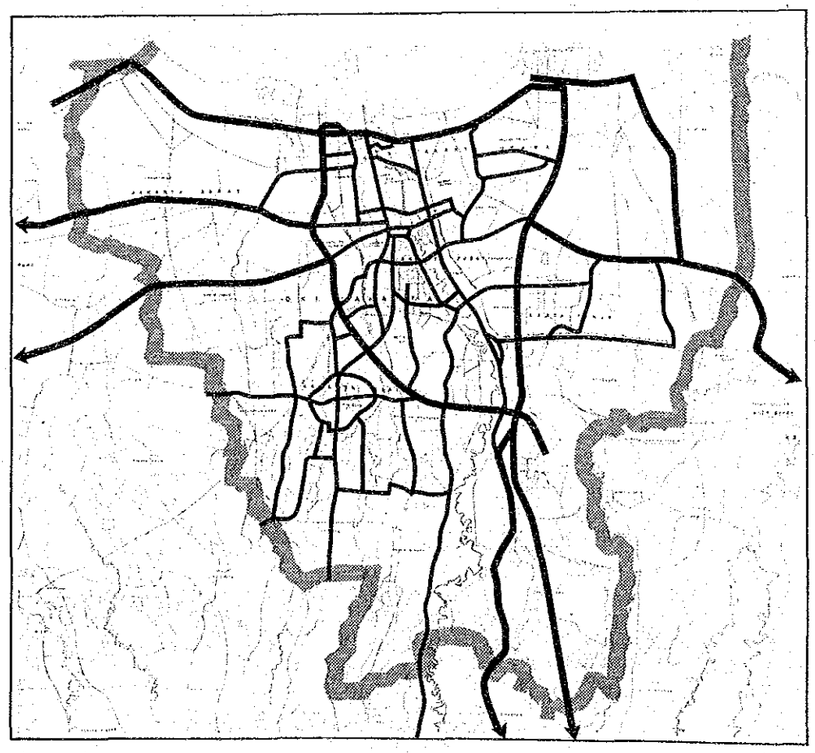


Fig. 1.5.2
ROAD CLASSIFICATION PROPOSED BY DKI JAKARTA TO BINA MARGA

LEGEND

PRIMARY ARTERIAL ROAD
SECONDARY ARTERIAL ROAD
DKI JAKARTA BOUNDARY

ARTERIAL ROAD SYSTEM DEVELOPMENT STUDY IN JAKARTA METROPOLITAN AREA

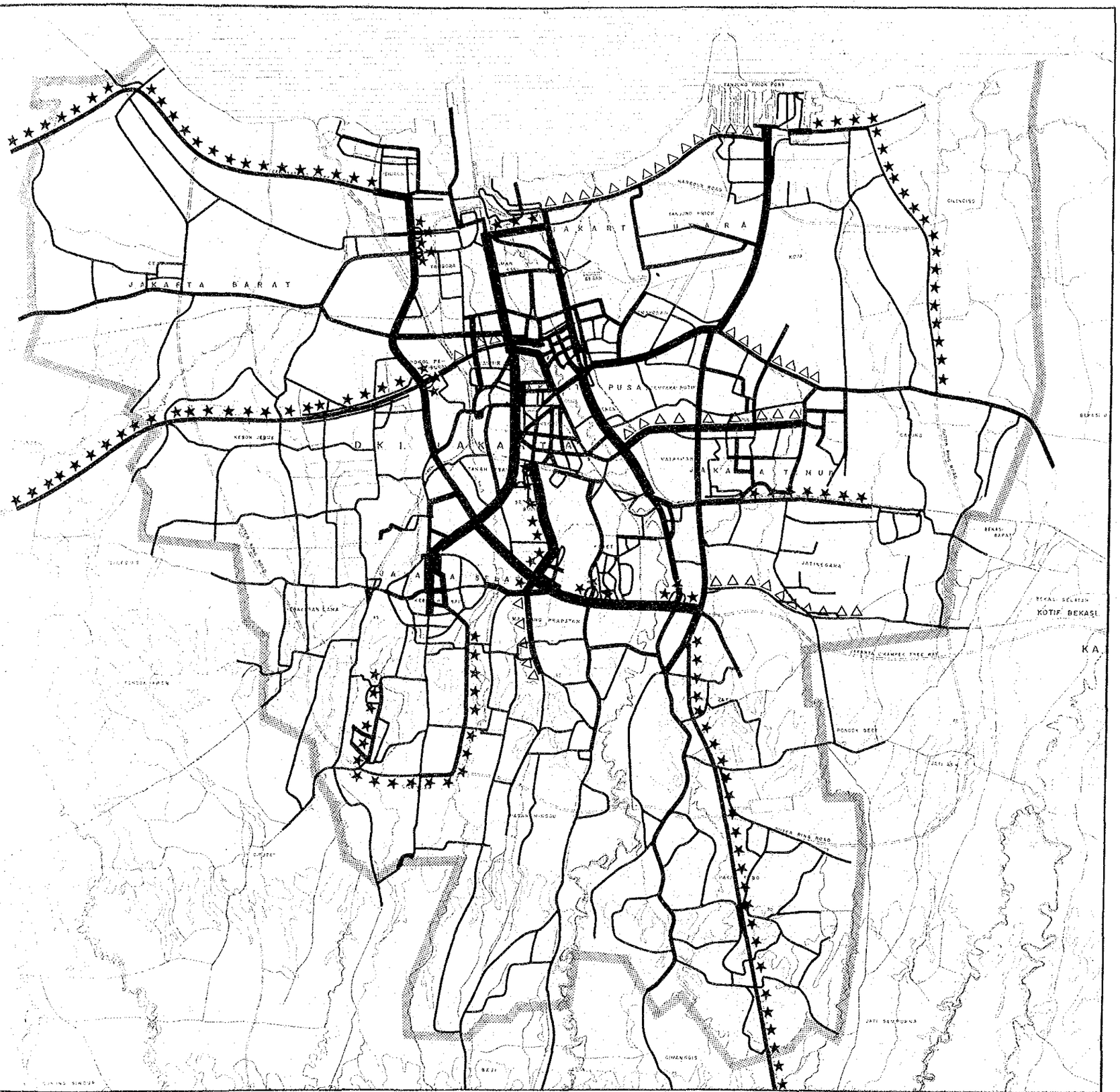


Fig. 1.5.3
EXISTING ROADS IN DKI JAKARTA

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

N

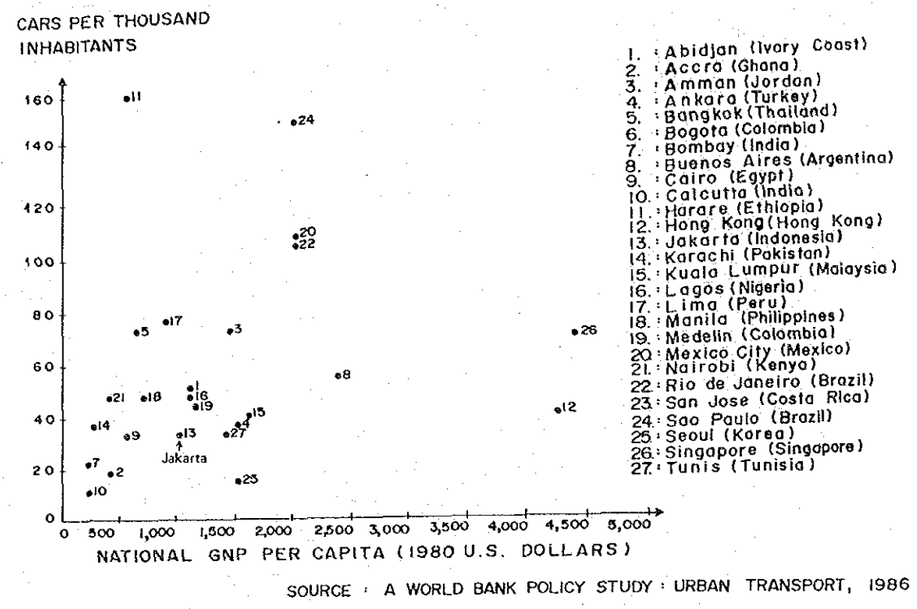
0 1 2 3 4 5 Km

ARTERIAL ROAD SYSTEM DEVELOPMENT STUDY IN JAKARTA METROPOLITAN AREA

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 as shown in Table 1.5.1. 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.

In spite of the high growth in the number of motor vehicles, the availability of motor vehicles is still low when compared with other major foreign cities as shown in Fig. 1.5.4. The motorization rate for private motor vehicles, excluding motorcycles, was 52 vehicles per 1000 residents and the rate including motorcycles was 141 vehicles per 1000 residents in 1985.



SOURCE : A WORLD BANK POLICY STUDY : URBAN TRANSPORT, 1986

Fig. 1.5.4 INCOME AND CAR OWNERSHIP

Table 1.5.1 CAR OWNERSHIP IN DKI JAKARTA : 1975 – 1985

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
NUMBER OF VEHICLES*:											
PASSENGER CAR	152,536	170,265	177,979	190,566	202,345	222,345	247,066	275,139	299,164	321,837	339,812
(1980=100)	(69)	(77)	(80)	(86)	(91)	(100)	(111)	(124)	(135)	(145)	(153)
PRIVATE PASSENGER CAR	137,775	152,348	158,350	170,375	180,538	200,452	222,756	246,200	273,725	295,583	313,593
(1980=100)	(69)	(76)	(79)	(85)	(90)	(100)	(111)	(123)	(137)	(147)	(156)
PUBLIC PASSENGER CAR	14,761	17,917	19,629	20,191	21,807	21,893	24,310	28,939	25,439	26,254	26,219
(1980=100)	(67)	(82)	(90)	(92)	(100)	(100)	(111)	(132)	(116)	(120)	(120)
BUS	9,819	10,976	13,444	17,132	21,655	29,350	38,478	49,827	62,515	81,047	98,539
(1980=100)	(33)	(37)	(46)	(58)	(74)	(100)	(131)	(170)	(213)	(276)	(336)
PRIVATE BUS	6,522	7,604	9,603	12,521	16,786	23,639	32,153	43,371	55,979	74,342	91,856
(1980=100)	(28)	(32)	(41)	(53)	(71)	(100)	(136)	(183)	(237)	(314)	(389)
PUBLIC BUS	3,297	3,372	3,841	4,611	4,869	5,711	6,325	6,456	6,536	6,705	6,683
(1980=100)	(58)	(59)	(67)	(81)	(85)	(100)	(111)	(113)	(114)	(117)	(117)
TRUCK	44,699	48,408	52,791	58,449	64,713	77,781	95,858	112,494	126,859	140,562	149,875
(1980=100)	(57)	(62)	(68)	(75)	(83)	(100)	(123)	(145)	(163)	(181)	(193)
MOTORCYCLE	281,665	313,580	339,634	369,428	403,668	428,144	495,312	570,972	628,414	669,906	696,389
(1980=100)	(66)	(73)	(79)	(86)	(94)	(100)	(116)	(133)	(147)	(156)	(163)
TOTAL	488,719	543,229	583,848	635,575	692,381	757,620	876,714	1,008,432	1,116,952	1,213,352	1,284,615
(1980=100)	(65)	(72)	(77)	(84)	(91)	(100)	(116)	(133)	(147)	(160)	(170)
POPULATION (IN THOUSANDS):	5,404	5,701	5,925	6,082	6,239	6,503	6,556	6,715	7,250	7,500	7,829
CAR OWNERSHIP**:											
a) MOTORCYCLE	52.1	55.0	57.3	60.7	64.7	65.8	75.6	85.0	86.7	89.3	88.9
b) PRIVATE PASSENGER CAR	25.5	26.7	26.7	28.0	28.9	30.8	34.0	36.7	37.8	39.4	40.1
c) PRIVATE BUS	1.2	1.3	1.6	2.1	2.7	3.6	4.9	6.5	7.7	9.9	11.7
b)+c) PRIVATE CAR	26.7	28.1	28.3	30.1	31.6	34.5	38.9	43.1	45.5	49.3	51.8
a)+b)+c) PRIVATE VEHICLE	78.8	83.1	85.7	90.8	96.3	100.3	114.4	128.1	132.2	138.6	140.7

SOURCE : JAKARTA STATISTICAL YEAR BOOK, 1977 - 1987
JAKARTA METROPOLITAN POLICE

Note *: EXCLUDING ARMED FORCES AND DIPLOMATIC CORPS
**: NUMBER OF MOTOR VEHICLES PER 1000 PERSONS

MOTOR VEHICLE TRAFFIC CHARACTERISTICS

Excessive motor vehicle traffic concentrates on the major arterial streets in DKI Jakarta as shown in Fig. 1.5.5. Jl. Sudirman and Jl. Thamrin carry more than 175,000 four-wheel vehicles and 45,000 motor-cycles in a day.

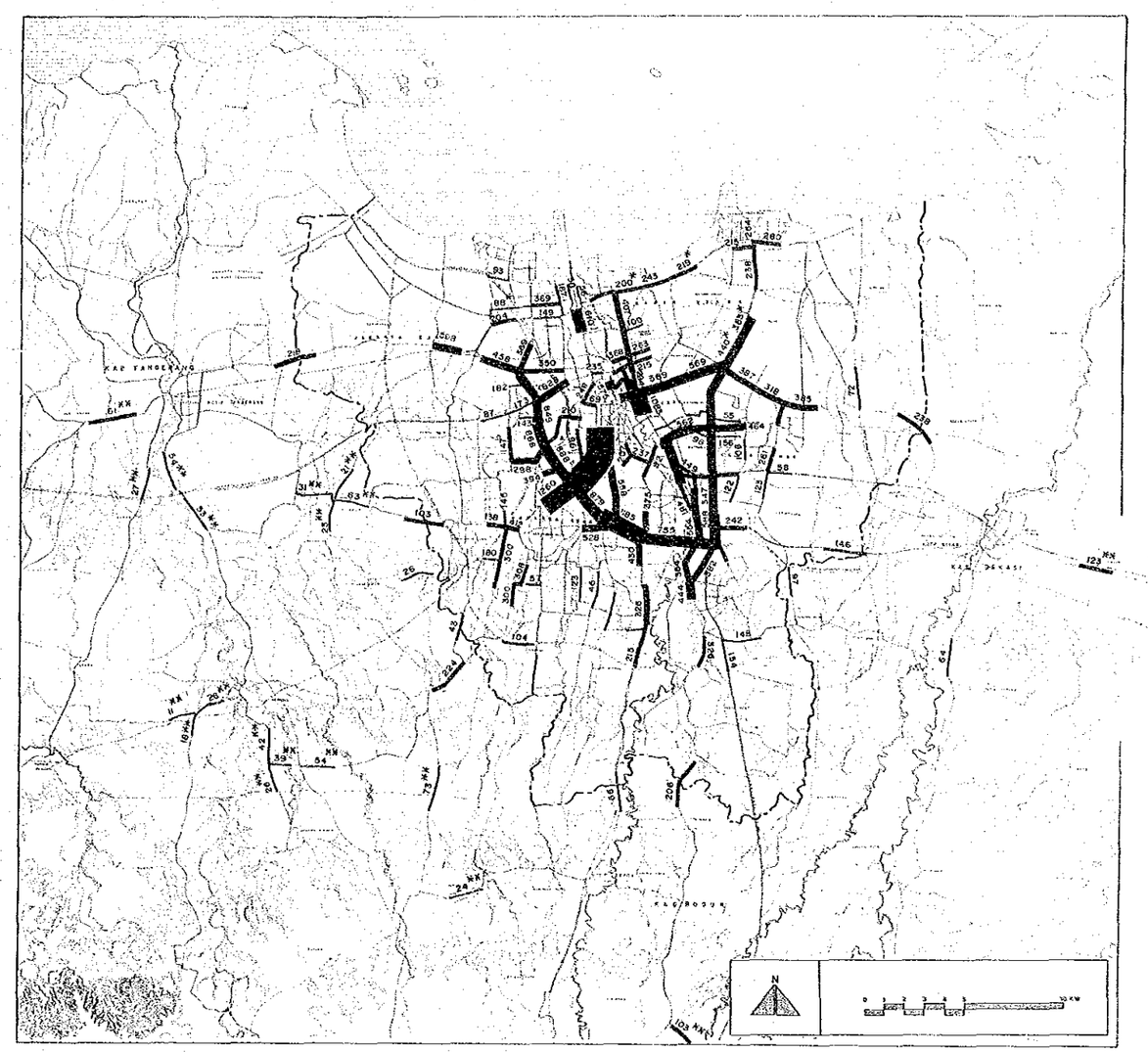
The traffic on the streets has two peak hours : the morning peak hours (7:00-9:00) and the afternoon peak hours (16:00-18:00). Traffic jams occurs on many road sections during these peak hours.

The major traffic flows in the morning peak hours are generally in the direction of the Central Area. This concentration of excessive traffic causes congestion on radial arterial streets.

The level of service on road transportation in the morning peak hours are shown in Fig. 1.5.6. The low level of service prevails not only on the streets in the Central Area, but also on the streets in suburban area.

TRAFFIC CONGESTION PROBLEMS ON ROADS AND STREETS

Traffic congestion problems are caused for several reasons. Fig. 1.5.7 shows the location of traffic congestion by type. They are basically caused by increasing traffic demands corresponding to the expansion of the urbanized area with the traffic flow patterns concentrating to the Central Area. The development and improvement of the street network could not catch up with the rapidly increasing demand. Furthermore, various transportation facilities and urban facilities impede traffic flows at several road sections and intersections. These facilities that restrict traffic flows are bus terminals, railway crossings, pasars, shopping centers and schools located along the arterial streets.



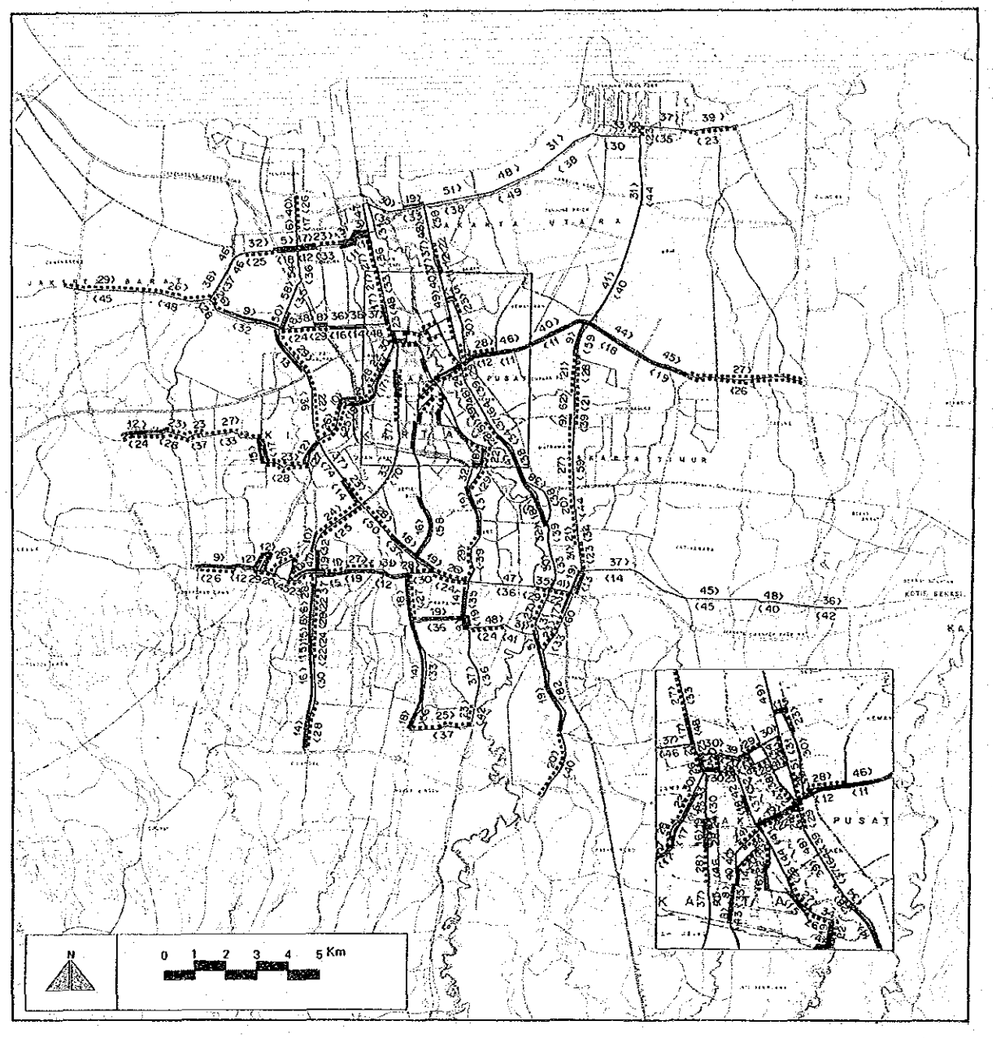
Source : ARSDS TRAFFIC COUNTING SURVEY, SEPT. & OCT., 1985
**: J.I.U.T PROJECT PART V, 1984
** : ARSDS TRAFFIC COUNTING SURVEY IN BOTABEK, MAY 1986

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. 1.5.5 PRESENT TRAFFIC FLOWS ON STREETS IN THE JAKARTA METROPOLITAN AREA



LEGEND

UNSTABLE FLOW (20 – 30 km/h)

FORCED FLOW (– 20 km/h)

SURVEYED ROUTE

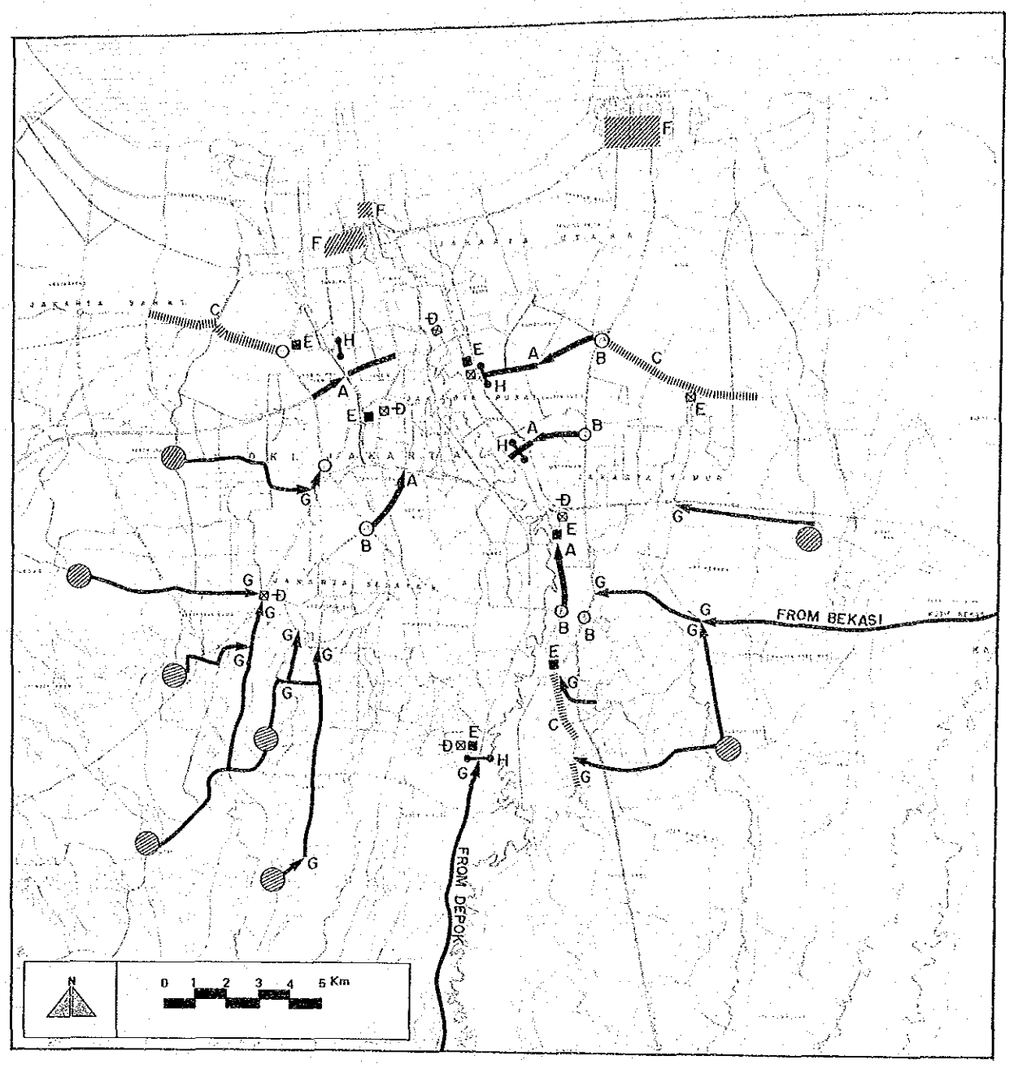
NOTE

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

SOURCE

ARSDS TRAVEL SPEED SURVEY, 1985

Fig. 1.5.6 LEVEL OF SERVICE IN MORNING PEAK HOURS



LEGEND

CONGESTION TYPE AND REASON

A : CONGESTED RADIAL ARTERIAL STREETS TOWARD CBD

B : CONGESTED INTERSECTIONS BETWEEN THE RADIAL ARTERIAL STREETS TOWARD CBD AND THE S-W BY-PASS AND N-S BY-PASS

C : CONGESTION ON REGIONAL ROADS

D : CONGESTION CAUSED BY PASARS, SHOPPING CENTERS AND SCHOOLS ALONG ARTERIAL STREETS

E : CONGESTION CAUSED BY BUS TERMINALS LOCATED AT MAJOR INTERSECTIONS

F : CONGESTION AROUND PORT AND WAREHOUSE AREA

G : CONGESTION AT SUBURBAN INTERSECTIONS DUE TO SPRAWL OF THE RESIDENTIAL AREA AND DELAY OF RELATED ROAD IMPROVEMENT

H : CONGESTION AT RAILWAY CROSSING

Fig. 1.5.7 LOCATION MAP OF TRAFFIC CONGESTION PROBLEMS

PEDESTRIAN TRAFFIC AND TRANSPORTATION FACILITIES

Trips made by the Jakarta residents on foot account for about 40% of all the trips by all transport modes. However little attention is paid to pedestrian traffic at present.

Only about 30% of arterial streets in length have sidewalks at present. It is often found that some of these sidewalks are occupied by street vendors. Pedestrian bridges are set up on the major arterial streets, but they are inconvenient for pedestrians due to their location and long approach.

Although traffic lights are placed at almost all of the major intersections to control motor vehicle traffic, few traffic lights for pedestrian crossings have been installed up to now.

PARKING

Recently the lack of parking facilities has become a serious problem in the Central Area. Although the present transportation system mainly depends on road transportation and parking facilities which have not yet been sufficiently developed.

Parking facilities can be classified into the three following types:

1) Parking for pasars and shopping centers
2) Parking for government offices and office buildings
3) Street parking

Users of pasar and shopping center parking facilities should pay parking charges. Most of this type of parking is short-term. People who use street parking facilities, which are managed by the Parking Authority, DKI Jakarta (Badan Pengelola Perparkiran), are also required to pay parking charges, but often the charges are not so expensive and users often take long-term parking. Government offices and office buildings have parking lots, but most of them have no parking charges, which permits long-term parking. Most of the people using these facilities can only use cars for commuting. Recently many high-rise office buildings have been under construction. Most of them will have parking buildings or parking lots; however, these parking facilities will be used by long-term parking users because there will be no parking charges.

GOODS TRANSPORTATION

The existing cargo transportation does not yet fully function as an effective system. A truck terminal system has not yet been established and there is no trucking company which covers the entire country. The utilization of trucking companies is low due to their lack of scheduled operation, and poor management on goods storage and handling. Many manufacturing companies prefer to own their own trucks. At present the only restriction on truck traffic is executed for cargo transportation. Trucks are restricted from entering DKI Jakarta by time-band and fixed routes in order not to disturb the intra-city traffic.

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.

BUS OPERATION SYSTEM

The present bus operation system in DKI Jakarta is basically a terminal system; that is, buses operate between bus terminals. Recently the system has been changing into a bus station system.

Bus operations are divided into city bus services and inter-city bus services. City bus services are largely classified into three types by vehicle type as shown in Table 1.5.2.

1) Large buses (Bis Kota and PATAS) mainly operate on arterial streets between city bus terminals in Jakarta. PATAS serves as express buses with few bus stops and all passengers can be seated. The service area served by this type of bus is limited to larger streets.

2) Micro buses (Metro Mini, Kopaja, etc.) serve not only arterial streets, but also narrow collector streets in residential areas. The services of this type of bus are supplementary to large bus services and most of their routes have an access service function.

3) Small buses (Mikrolet, KOASI, KAB, etc.) are used by more passengers with short trip distances than passengers with long trip distances. Mikrolets operate especially in the limited Central Area and between the Central Area and suburban areas. Other small bus services mainly cover the fringe area of DKI Jakarta.

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 as shown in Fig. 1.5.8. 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, as shown in Fig. 1.5.9.

BUS OPERATION BODY

There are many bus operating bodies. PPD is a local government company and Mayasari Bakti is a private company. PPD and Mayasari Bakti apply a monthly salary system, but the target system is still valid for the crew. Metro Mini, Kopaja, Mikrolet etc. are not standard companies, but cooperative bodies for private bus owners. The bus crew usually makes a rental contract for a bus with the fleet owner.

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, transit results in a high total transportation cost.

PROBLEMS OF BUS TERMINALS

The problem with the bus terminals is that they are utilized as bus pools. This brings about congestion in bus terminals. The large number of generated and attracted bus trips from/to bus terminals cause congestion on the streets surrounding the bus terminals.

Table 1.5.2 EXISTING CITY BUS SERVICE 1985

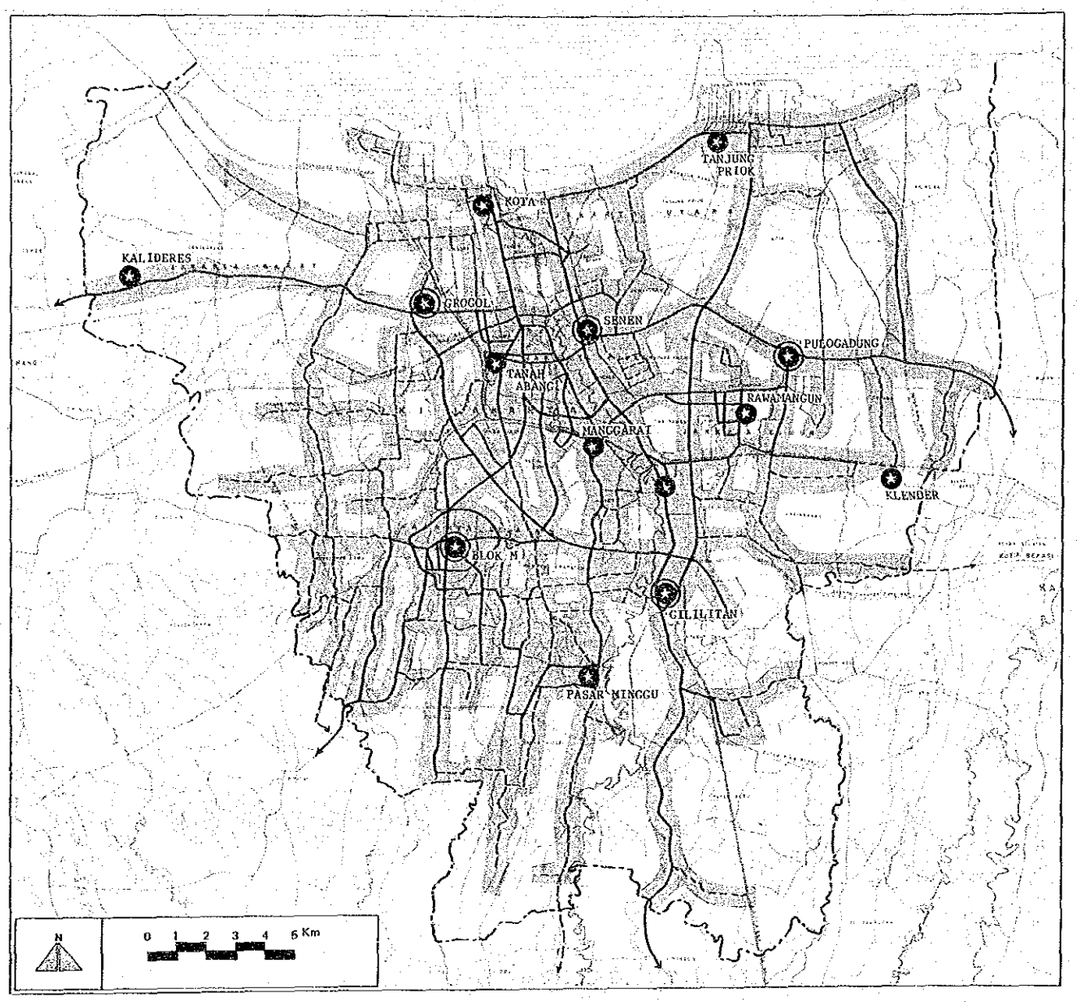
Bus Service Name	Vehicle	Seating Capacity	Bus Route	Bus Stop	Number of Bus Routes*	Total Length of Bus Service Roads in DKI**	Passenger Fare (Rp)
1) Bis Kota	Double Decker	85 Seats	Fixed	Fixed	5		150
	Large Bus	50 seats	Fixed	Fixed	94	307 km	150
2) PATAS	Large Bus	50 seats	Fixed	Fixed	21		250
3) Bis Mikro	Micro Bus	30 seats	Fixed	Not Fixed	84	465 km	150
4) Mikrolet	Small Bus	9 seats	Fixed	Not Fixed	19	-	150-300
5) KOASI, KAB. etc.	Small Bus	9 seats	Fixed	Not Fixed			
	Small Truck	9 seats	Fixed	Not Fixed	12	-	100-300

Source: * Bus Count Survey by ARSDS Team in September 1985
** ARSDS Team estimated based on Bus Count Survey

Table 1.5.3 CITY BUS ROUTES AND BUS TRIPS BY TERMINAL, 1984

TERMINAL	PATAS		BIS KOTA		MIKRO BUS		MIKROLET		TOTAL	
	No. of Routes	No. of Trips	No. of Routes	No. of Trips	No. of Routes	No. of Trips	No. of Routes	No. of Trips	No. of Routes	No. of Trips
Cililitan	7	487	20	1,745	8	736	9	3,397	44	6,365
Pulo Gadung	5	336	19	1,488	11	1,546	2	337	37	3,707
Tanjung Priok	2	179	13	917	5	904	2	1,276	22	3,276
Grogol	6	560	17	1,616	8	792	3	2,456	34	5,424
Blok M	7	410	25	2,720	24	5,054	0	0	56	8,184
Rawa Mangun	1	52	12	598	2	560	*	1,537	*	2,747
Kampung Melayu	0	0	4	405	10	1,595	6	6,187	20	8,187
Tanah Abang	1	24	9	702	5	706	5	7,097	20	8,529
Manggarai	0	0	9	760	6	1,540	0	0	15	2,300
Pasar Minggu	0	0	4	143	11	2,684	4	4,492	19	7,319
Senen	6	461	27	2,828	11	3,222	2	5,031	46	11,542
Kota	6	346	7	437	2	116	4	6,436	19	7,335
Klender	1	48	1	35	3	352	3	260	8	695
Total	-	2,903	-	14,394	-	19,807	-	38,506	-	75,610

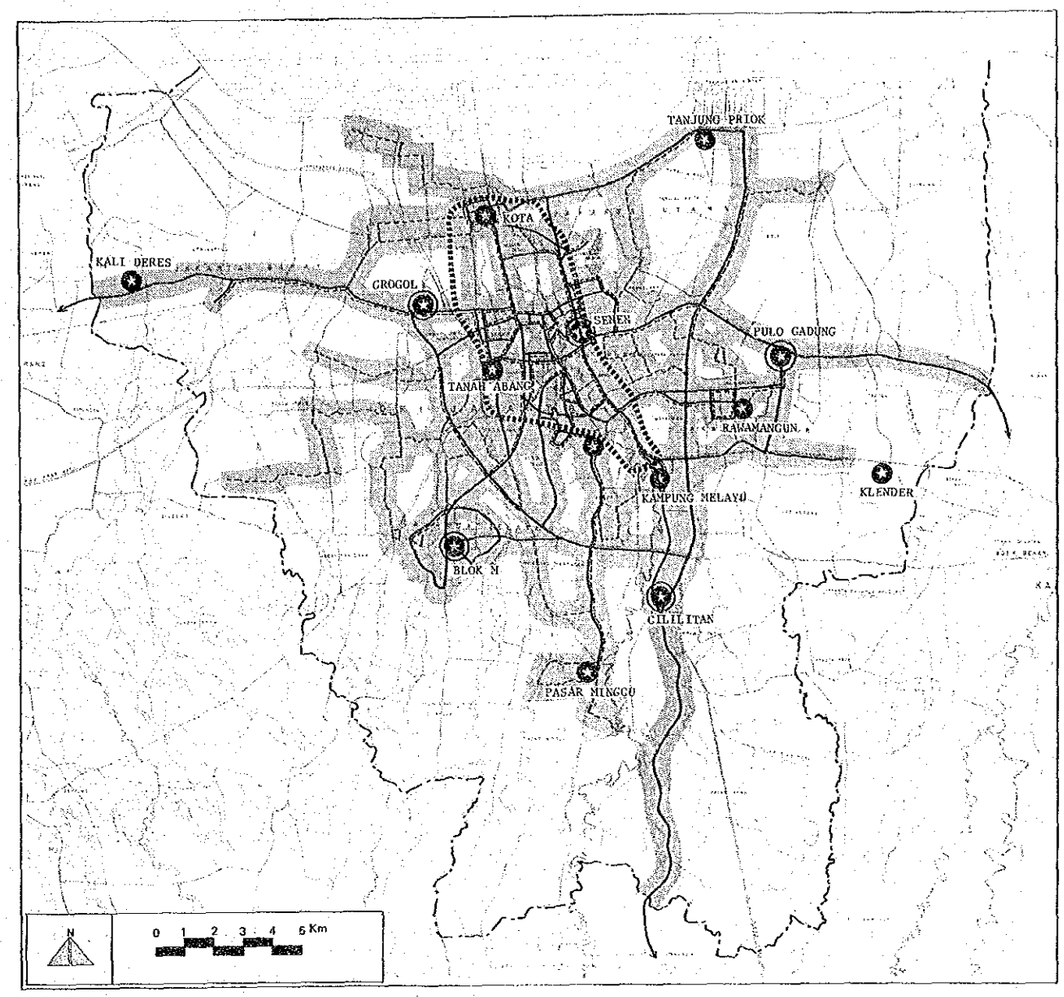
Source: Jakarta Intra Urban Tollway Project Part V Study, April, 1984
Note : The number of trips is the number of bus vehicle trips which leave a terminal.
* : Unknown



LEGEND

- MAJOR BUS TERMINAL
- MINOR BUS TERMINAL
- BUS SERVICE COVERAGE BY LARGE AND MICRO BUS
- STREETS SERVED BY LARGE BUS OR MICRO BUS
- STREETS SERVED BY MICRO BUS ONLY

Fig. 1.5.8 BUS SERVICE COVERAGE IN DKI JAKARTA 1985



LEGEND

- MAJOR BUS TERMINAL
- MINOR BUS TERMINAL
- BUS SERVICE COVERAGE BY LARGE AND MICRO BUS
- BUS ROUTE OF LARGE BUS WITH DIRECT ACCESS TO THE CENTRAL AREA
- BUS ROUTE OF MICRO BUS WITH DIRECT ACCESS TO THE CENTRAL AREA
- CENTRAL AREA BOUNDARY

Fig. 1.5.9 BUS SERVICE COVERAGE OF BUSES WITH DIRECT ACCESS TO THE CENTRAL AREA IN DKI JAKARTA 1985

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. 1.5.10. The characteristics of the four radial routes are summarized below:

1) Bogor Line
This line functions as a suburban commuter railway. It carries the largest number of passengers by the Jabotabek train (commuter train) because of its frequent operation.

2) Bekasi Line
This line is characterized as a middle and long distance train corridor, connecting Jakarta with central and east Java. This line is also utilized for cargo transportation. Thus, there is little room for operating commuter trains.

3) Merak Line
This line is used by commuter trains, middle/long distance trains and freight trains.

4) Tangerang Line
This line is expected to be utilized as a commuter train; however, it does not function well at present due to its low frequency.

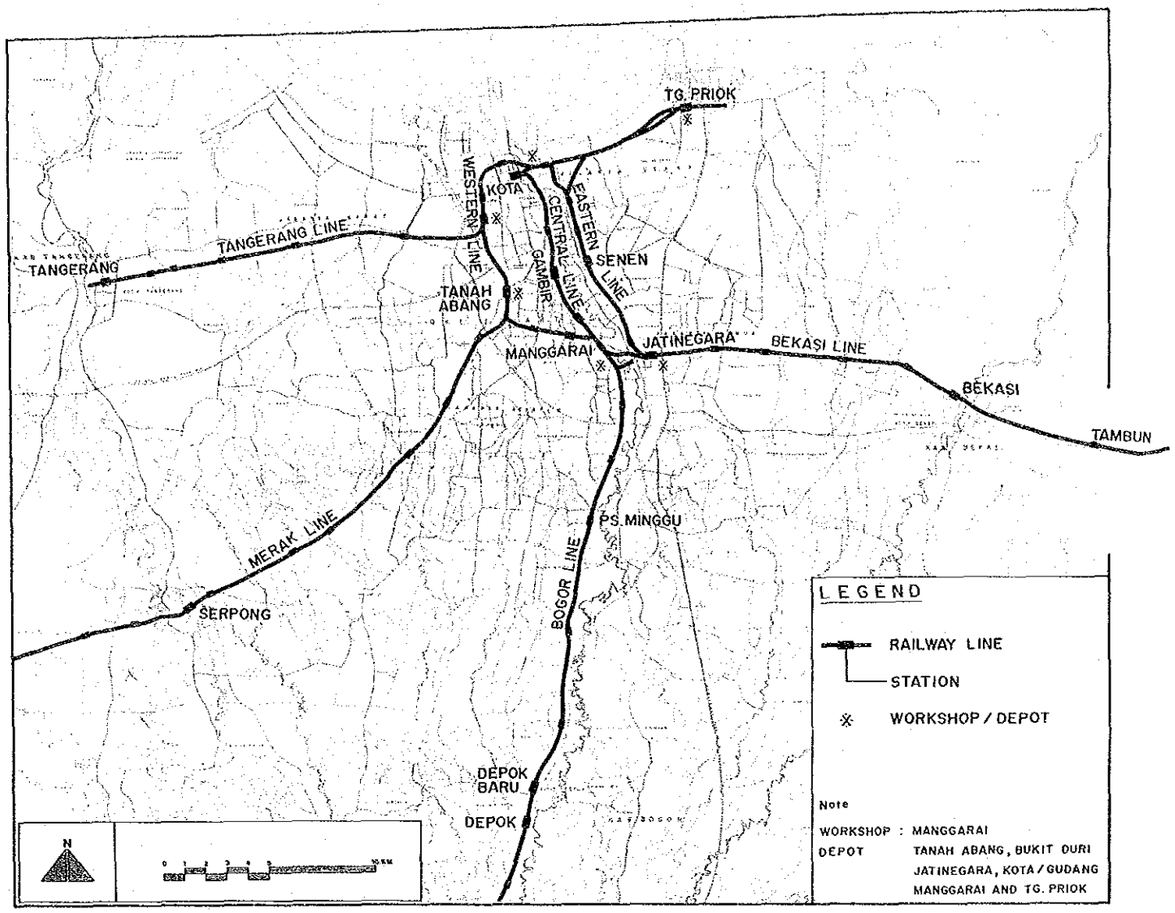
Railway is a transportation mode operating on a separated right-of-way. Thus railway has the potential to serve as a reliable public transportation mode. Since the railway system was originally developed for goods movement to the port in Jakarta and for region-wide passenger movements, it has been unsuitable 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 present the 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. Vast 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.



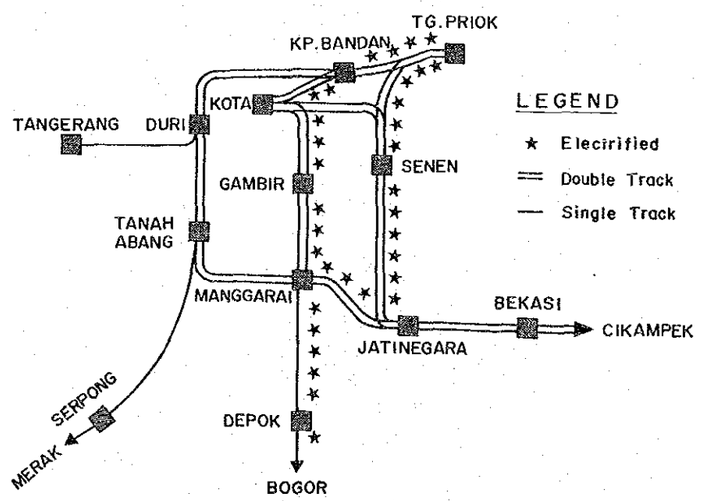
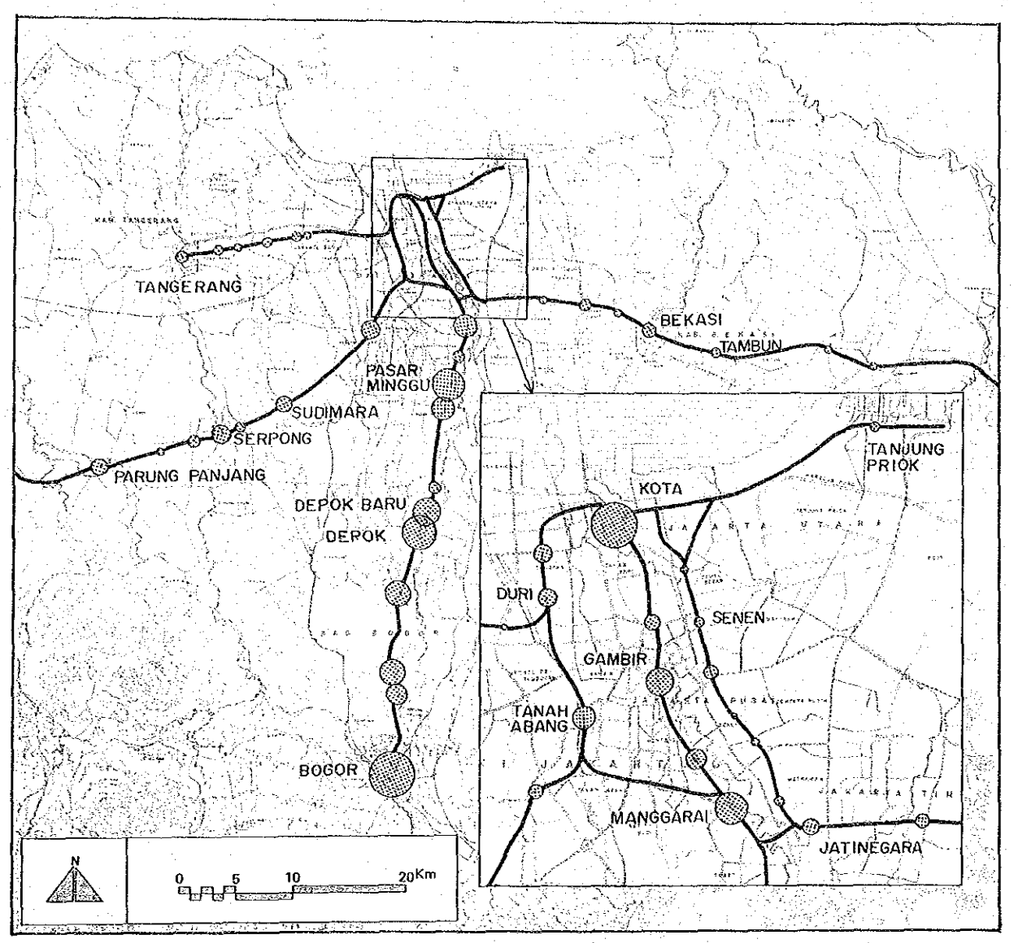


Fig. 1.5.10 EXISTING RAILWAY NETWORK IN JAKARTA METROPOLITAN AREA



LEGEND

PASSENGERS/DAY

1,000

5,000

10,000

Fig. 1.5.11 NUMBER OF JABOTABEK TRAIN PASSENGERS BY STATION

Table 1.5.4 NUMBER OF PASSENGERS PASSING CORDON LINE

Name of Railway Line		All Day			Morning Peak Hours (6:00-9:00)		
		Number of Passengers	Number of Trains	Passengers /Trains	Number of Passengers	Number of Trains	Passengers /Trains
Bogor Line	Inflow	18,351	24	765	8,070	8	1,009
(Jabotabek Train)	Outflow	17,736	24	739	1,174	4	294
Bekasi Line	Inflow	5,876	12	490	2,555	4	639
(Jabotabek Train)	Outflow	5,652	10	565	364	1	364
Bekasi Line (Middle/Long Distance Train)	Inflow	11,398	27	422	2,016	5	403
	Outflow	12,311	28	440	2,715	6	453
Bekasi Line	Inflow	17,274	39	443	4,571	9	508
(Total)	Outflow	17,963	38	473	3,079	7	440
Merak Line	Inflow	6,523	11	593	2,198	3	733
(Jabotabek Train)	Outflow	6,426	9	714	794	1	794
Merak Line (Middle/Long Distance Train)	Inflow	4,213	6	702	738	1	738
	Outflow	2,756	4	689	1,525	2	763
Merak Line	Inflow	10,736	17	632	2,936	4	734
(Total)	Outflow	9,182	13	755	2,319	3	733
Tangerang Line	Inflow	1,046	5	209	40	1	340
(Jabotabek Train)	Outflow	1,259	5	252	96	1	96
Total	Inflow	47,407	85	558	15,917	22	724
	Outflow	46,140	80	577	6,668	15	445

Source: ARSDS Railway Survey, 1986

1.5.2 TRAVEL BEHAVIOR

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 1.5.5. 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. 1.5.12. Major person trip flows terminate in the Central Area from the suburban area, as well as from the urban area as shown in Fig. 1.5.13. Kebayoran and Tanjung Priok are other districts with a potential to attract trips from their surrounding area.

TRIP DISTRIBUTION

As shown in Fig. 1.5.13, 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.

Table 1.5.5 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

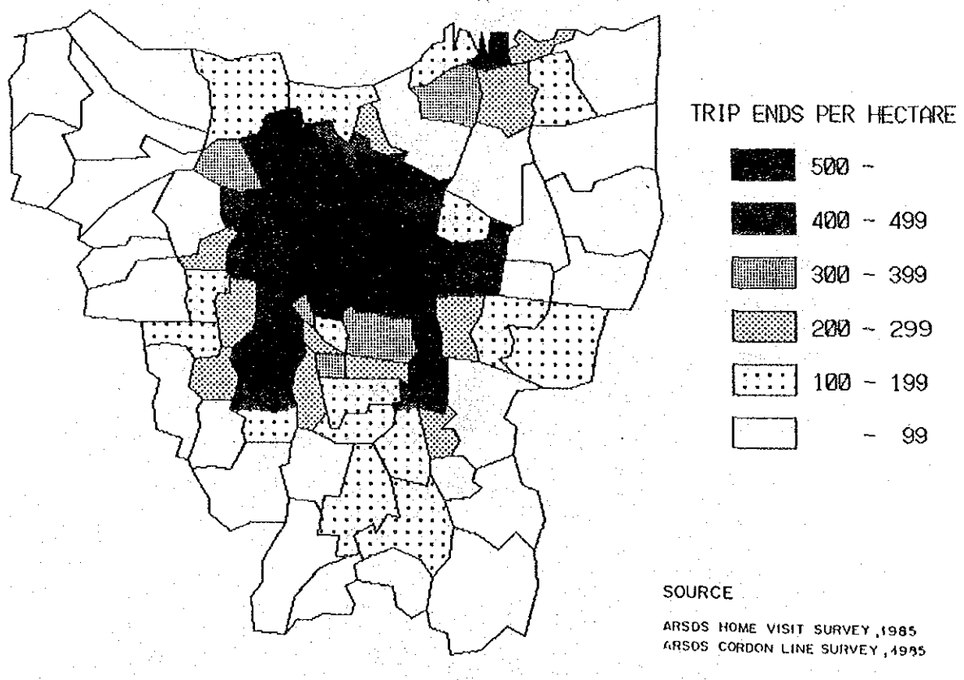
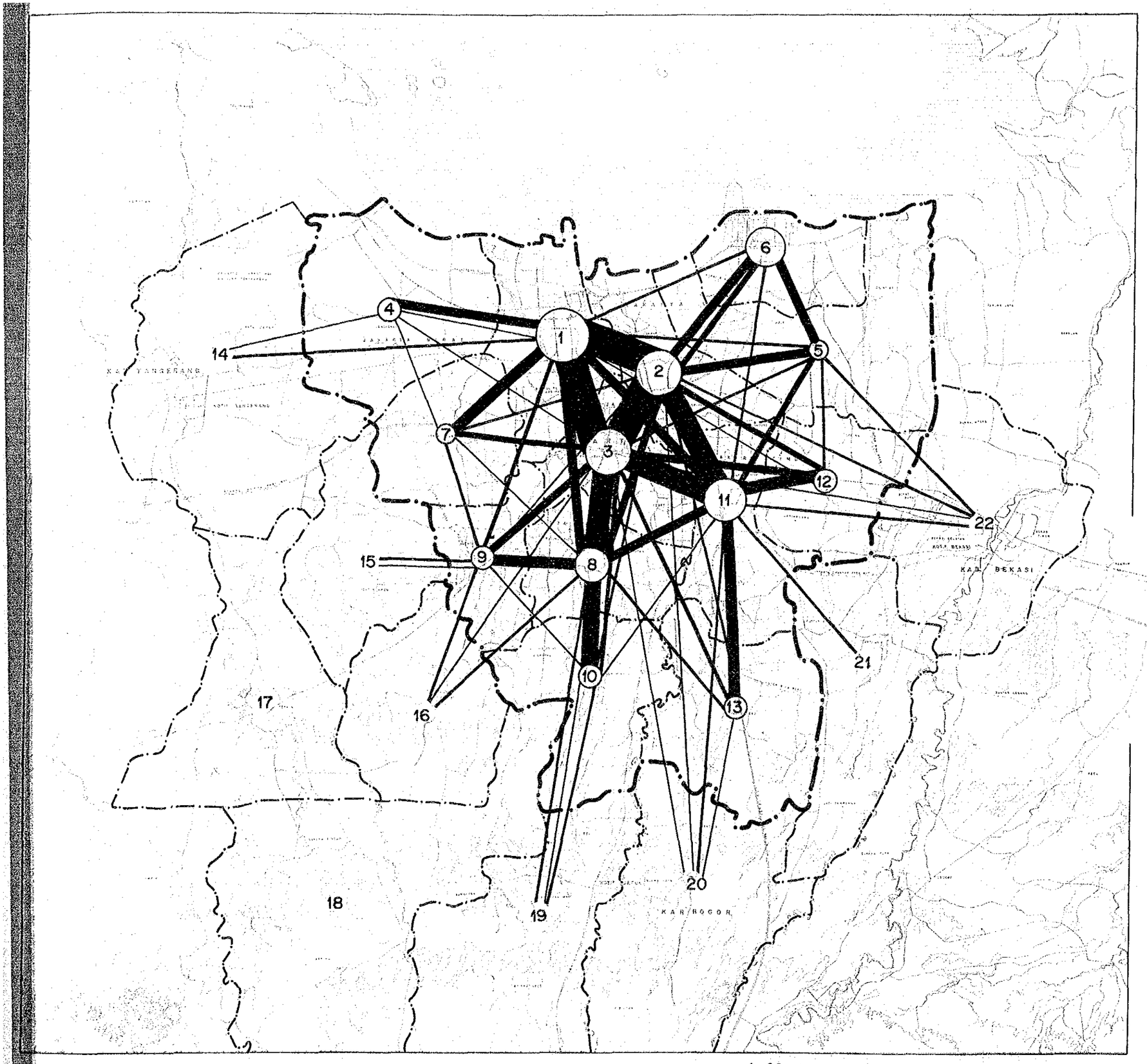


Fig. 1.5.12 TRIP ATTRACTION IN DKI JAKARTA, 1985

Fig. 1.5.13
PERSON TRIP FLOWS IN JAKARTA METROPOLITAN AREA, 1985



100,000 1,000,000

INTRA-ZONAL TRIPS IN DKI JAKARTA

100,000 200,000 300,000

PERSON TRIPS PER DAY

NOTE : LESS THAN 10,000 TRIPS ARE OMITTED

SOURCE : ARSDS HOME VISIT SURVEY, 1985.
ARSDS CORDON LINE SURVEY, 1985

N

0 1 2 3 4 5 10KM

ARTERIAL ROAD SYSTEM DEVELOPMENT STUDY IN JAKARTA METROPOLITAN AREA

TRIP PURPOSE COMPOSITION

Trip purpose composition is shown in Fig. 1.5.14. "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. 1.5.15.

TRANSPORT MODE

Modal distribution of weekday trips by the Jakarta residents is shown in Table 1.5.6. Significantly, about 40% of all the trips are made on foot. Among the other non-motorized modes of transport, becak and bicycle account for 4.6% and 2.4% of all the transport modes. These figures indicate that the becak is a more popular mode for the Jakarta residents than is the bicycle.

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.

Modal composition varies widely by trip purpose as illustrated in Fig. 1.5.16. Motorized transport modes are well used for business, "to work" and private matters trips, which account for 85.1%, 73.1% and 63.6% of all the trips. Business trips are especially made by private motorized transport such as private passenger cars and motorcycles. On the contrary, about 65% of "to school" and "shopping" trips depend on the non-motorized transport represented by "on foot".

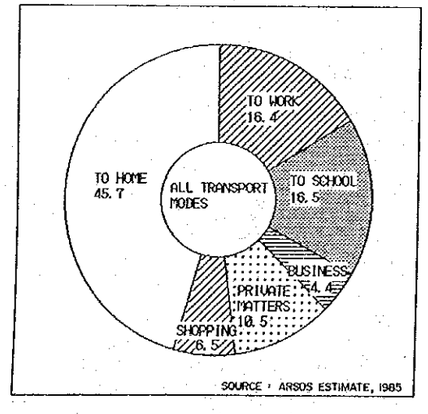


Fig. 1.5.14 TRIP PURPOSE COMPOSITION OF ALL TRIPS

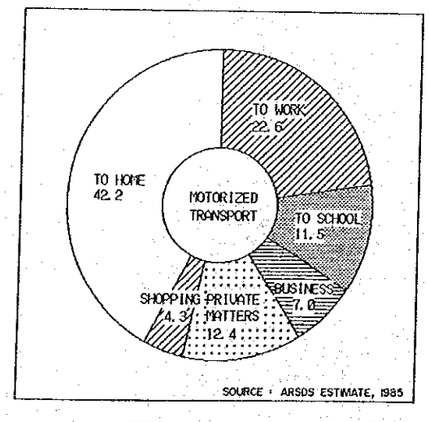
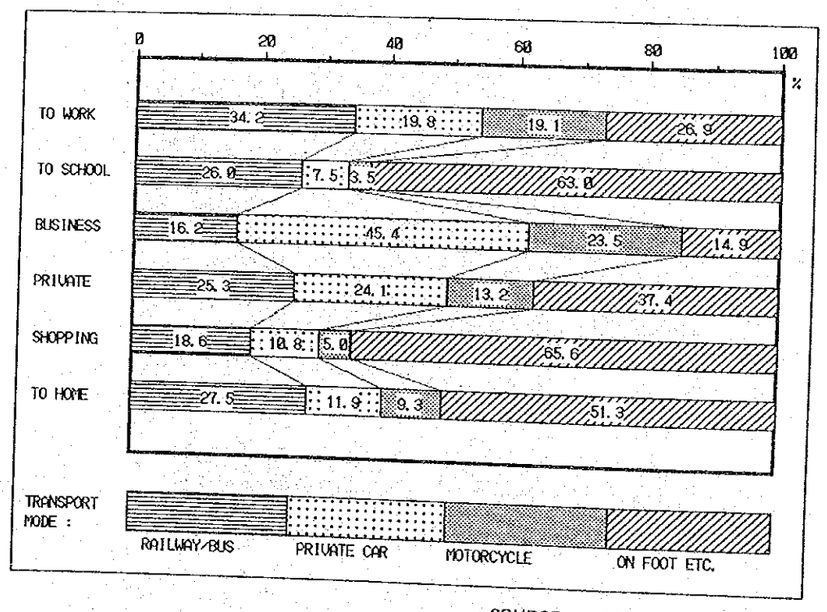


Fig. 1.5.15 TRIP PURPOSE COMPOSITION OF TRIPS BY MOTORIZED TRANSPORT

Table 1.5.6 DISTRIBUTION OF TRANSPORT MODES

Representative Mode of Transport	Number of Trips (x 1000)	Percent of All Modes	Percent of Motorized Transport
Motorized Transport			
Public Transport			
Railway	21	0.2	0.3
Large Bus	1,776	13.5	25.6
Micro Bus	959	7.3	13.8
Mini Bus	793	6.0	11.4
Taxi	68	0.5	1.0
Bajaj, Helicak	333	2.5	4.8
Sub Total	3,950	30.2	57.0
Private Transport			
Private Mini Bus	426	3.2	6.1
Private Passanger Car	985	7.5	14.2
Truck	61	0.5	0.9
Pick Up	111	0.8	1.6
Motorcycle	1,400	10.7	20.2
Sub Total	2,983	22.7	43.0
Total of Motorized Transport	6,933	52.9	100.0
Non-Motorized Transport			
Becak	609	4.6	-
Bicycle	313	2.4	-
Walking	5,239	39.9	-
Total of Non-Motorized Transport	6,161	46.9	-
Other Vehicle	10	0.1	-
Unknown	16	0.1	-
Grand Total	13,120	100.0	-

Note: Trips made by Jakarta residents
Estimate based on the ARSDS Home Visit Survey, 1985



SOURCE : ARSDS ESTIMATE 1985

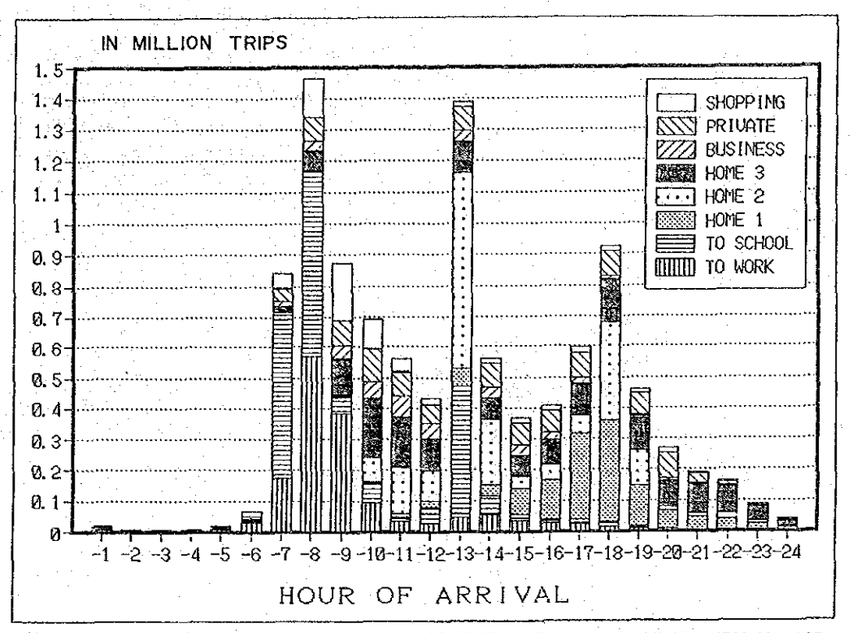
Fig. 1.5.16 MODAL COMPOSITION BY TRIP PURPOSE

DEMAND IN PEAK HOURS

Three peak periods of daily person trips were observed in the classification of arrival time at the destination as shown in Fig. 1.5.17. Of the total daily trips, the morning peak hours (7:00-9:00) account for 22.4%, the noon peak hour (12:00-13:00) accounts for 13.3%, and the evening peak hours (16:00-18:00) account for 14.6%. Thus, 50.3% of the total daily trips terminate during these three peak periods. This hourly concentration of trips causes the congestion on transportation facilities.

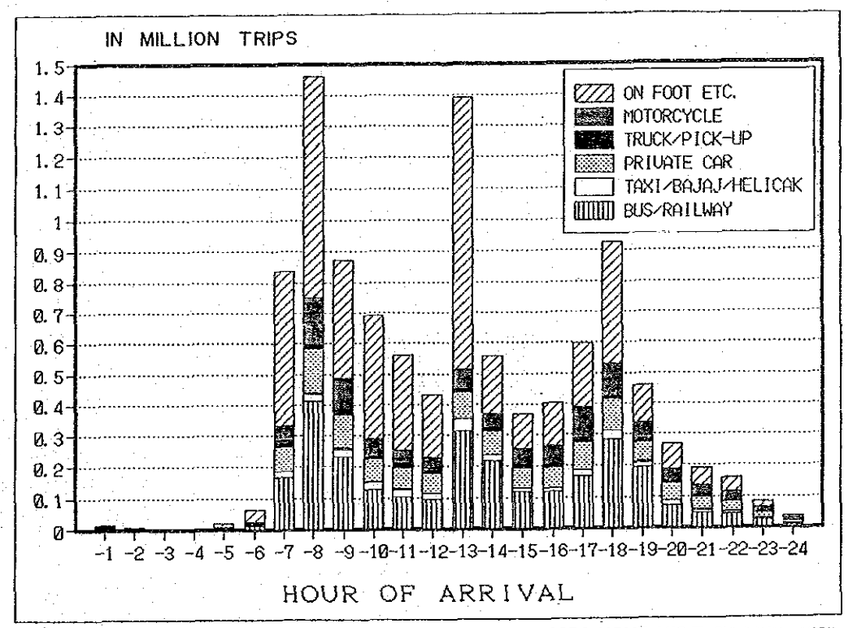
The morning peak periods mainly consists of "to work" and "to school" trips is one hour earlier than that of "to work" trips. The noon peak period mainly consists of "to school" trips and "to home 2 (from school)" trips, reflecting the two shift school system adopted in Indonesia. "To home" trips are predominant in the evening peak periods, with less conspicuous peak than the morning and the noon peak periods.

Hourly fluctuation of trips by motorized transport modes has a less conspicuous peak than that of all modes of transport, because "to school" trips and "to home 2 (from school)" trips, which contribute in making the peaks of trips by all transport modes, are largely made by non-motorized transport as shown in Fig. 1.5.18.



SOURCE : ARSDS HOME VISIT SURVEY, 1985

Fig. 1.5.17 HOURLY FLUCTUATION OF PERSON TRIPS BY TRIP PURPOSE AT DESTINATIONS



SOURCE : ARSDS HOME VISIT SURVEY, 1985

Fig. 1.5.18 HOURLY FLUCTUATION OF PERSON TRIPS BY MODE OF TRANSPORT

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. 1.5.19. Moreover, the average trip length of the high income level is also longer than that of the lower income group as shown in Table 1.5.7. That is, the lower income group travels less frequently, and even when they do go out, they don't or can't travel far. This is clearly shown in the comparison of the largest "to work" trip flows between the high income group and the low income group in Figures 1.5.22 and 1.5.23.

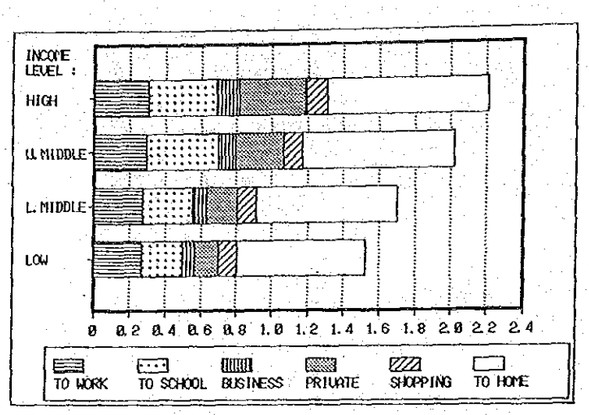
The choice of transport mode differs remarkably by the income level of households as shown in Fig. 1.5.20. The higher the income level is, the higher is the degree of dependence on private cars. Of all trips by the high income group, 64.2% are made by private car. On the other hand, a public transport 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. 1.5.21.

Table 1.5.7 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

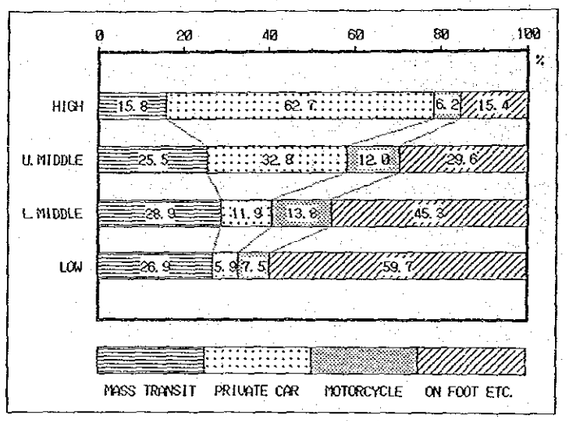
Note : 1) Trips made by registered Jakarta residents
2) Intra-zonal trip rate is calculated based on small zones



SOURCE : ARSDS ESTIMATE, 1985

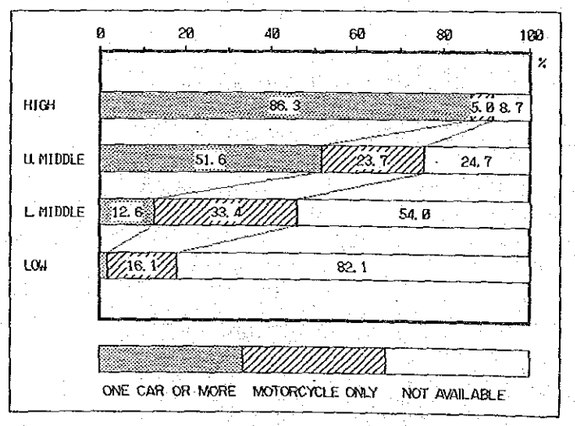
Fig. 1.5.19 NUMBER OF TRIPS PER PERSON PER DAY BY INCOME LEVEL

POPULATION PERSON (%)	NUMBER OF TRIPS (X1000)	NUMBER OF TRIPS PER PERSON PER DAY
305,300 (3.9 %)	674	2.21
955,200 (12.2 %)	1,933	2.02
2,849,900 (36.4 %)	4,847	1.70
3,718,900 (47.5 %)	5,666	1.52
7,829,300 (100.0 %)	13,120	1.68



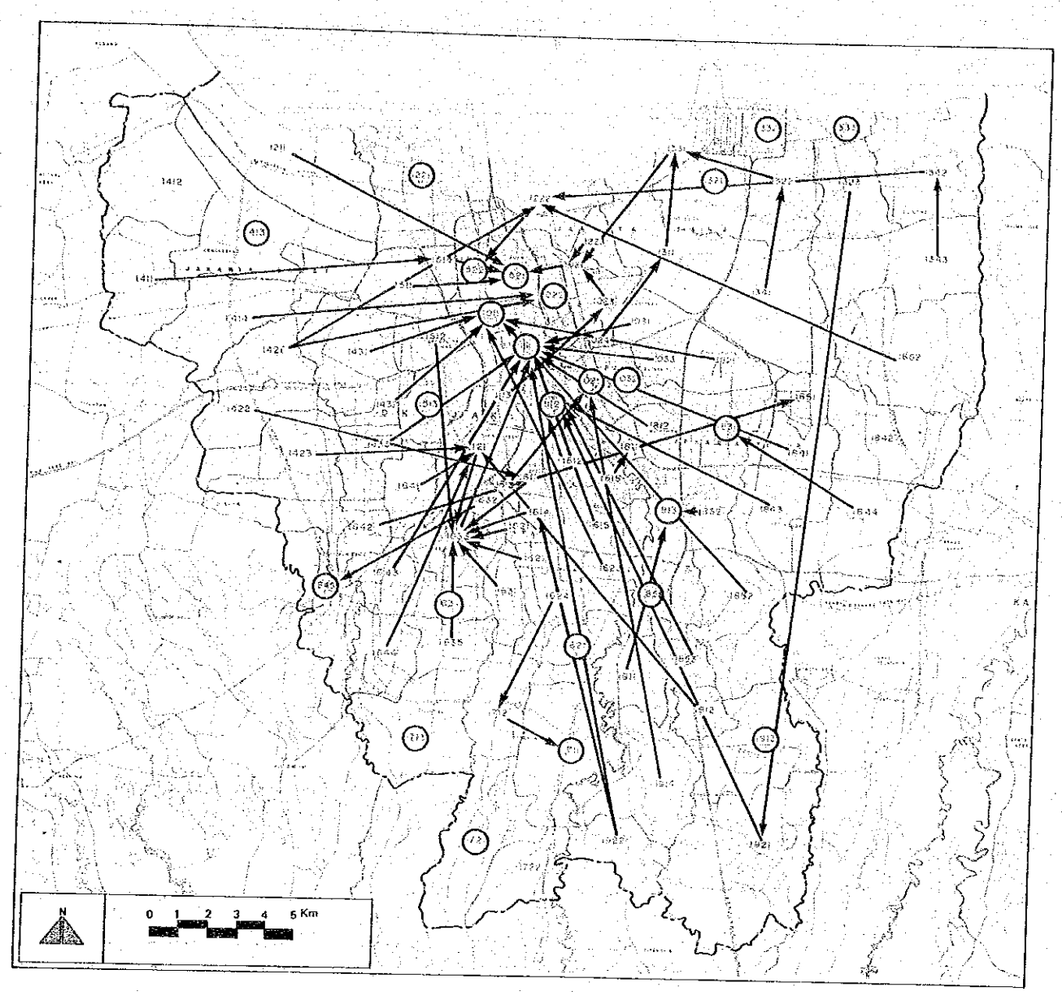
SOURCE : ARSDS HOME VISIT SURVEY, 1985

Fig. 1.5.20 MODAL COMPOSITION BY INCOME GROUP



SOURCE : ARSDS HOME VISIT SURVEY, 1985

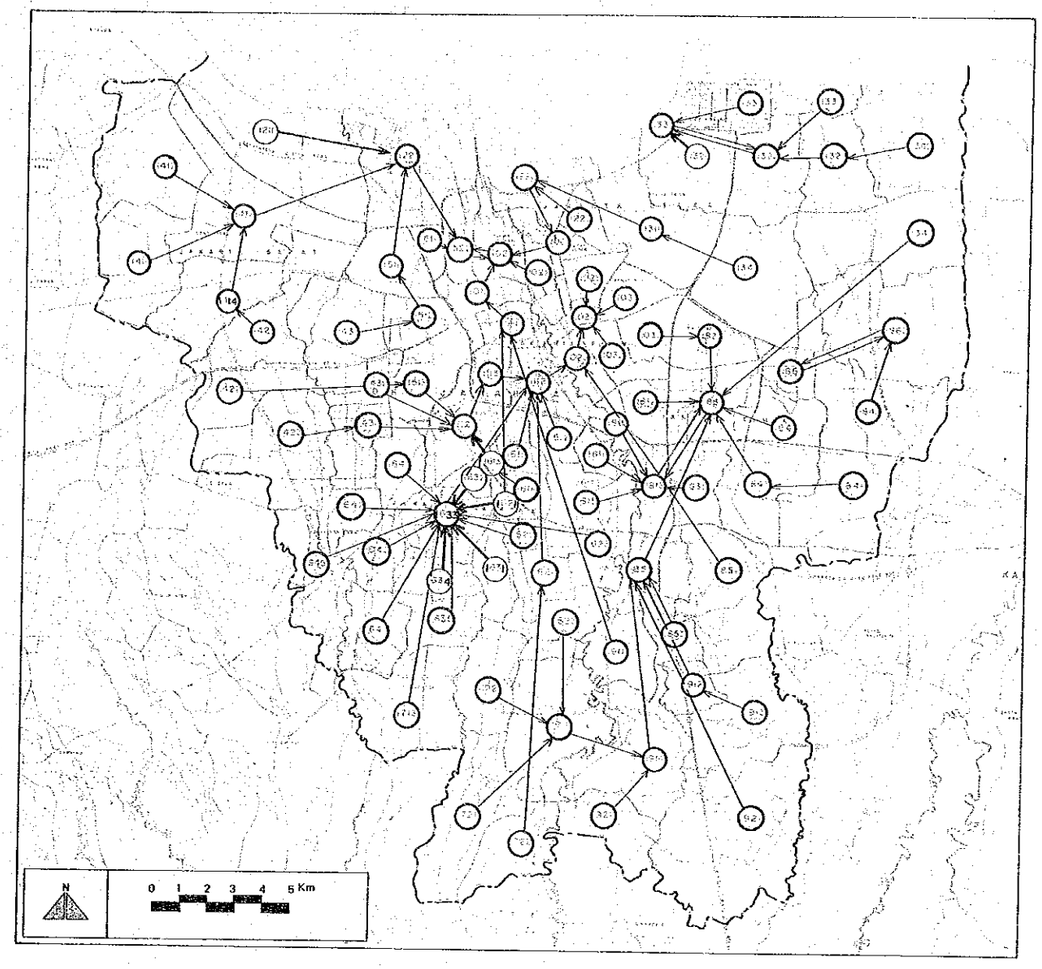
Fig. 1.5.21 AVAILABILITY OF MOTOR VEHICLE BY INCOME LEVEL



NOTE : BOLD LINE SHOWS THE FIRST LARGEST "TO WORK" TRIP FLOW
○ SHOWS INTRA-ZONAL TRIP FLOW (SMALL ZONE)

SOURCE : ARSDS HOME VISIT SURVEY, 1985

Fig. 1.5.22 THE LARGEST "TO WORK" TRIP FLOWS OF HIGH INCOME GROUP



NOTE : BOLD LINE SHOWS THE FIRST LARGEST "TO WORK" TRIP FLOW
THIN LINE SHOWS THE SECOND LARGEST "TO WORK" TRIP FLOW
○ SHOWS INTRA-ZONAL TRIP FLOW (SMALL ZONE)

SOURCE : ARSDS HOME VISIT SURVEY, 1985

Fig. 1.5.23 THE FIRST AND SECOND LARGEST "TO WORK" TRIP FLOWS OF LOW INCOME GROUP

TREND IN TRAVEL BEHAVIOR

A smaller scale interview survey, called the Jakarta Metropolitan Area Transportation Study (hereinafter called JMATS), was conducted in 1972. It is difficult to exactly compare the characteristics of travel behavior in both JMATS study and the ARSDS study, because the surveyed area and the surveyed range of transportation modes are different. However, the results of both studies are examined here in order to analyze the change of travel behavior.

The number of trips per person per day made by motorized transport has slightly increased from 0.86 in 1972 to 0.89 in 1985 as shown in Table 1.5.8.

Compared with the trip purpose composition in 1972, the composition of "to school", "private matters" and "shopping" trips have increased as shown in Table 1.5.9. Next, 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 1.5.10. To the contrary, the share of private transport has increased, especially in the share of motorcycles, which has increased drastically from 14.7% in 1972 to 20.0% in 1985. This change indicates that people have preferred private transportation, as a convenient and reliable transport, to public transportation.

Lastly, as shown in Table 1.5.11, the average trip length has increased from 6.4 km in 1972 to 7.1 km in 1985 in accordance with the development of the urbanized area. This expanded trip length, as well as the increased number of trips, has increased the burden on the transportation facilities.

Table 1.5.8 CHANGE IN NUMBER OF TRIPS PER PERSON PER DAY: 1972 – 1985

Mode of Transport	JMATS 1972	ARSDS 1985
Public Transport	0.52	0.51
Private Transport	0.34	0.38
Total	0.86	0.89

Note: Trips made by mode of motorized transport

Table 1.5.9 CHANGE IN TRIPS PURPOSE COMPOSITION: 1972 – 1985

Unit: %

Trip Purpose	JMATS 1972	ARSDS 1985
To Work	26.2	22.6
To School	9.3	11.5
To Home	42.4	42.2
Business	9.1	7.0
Private Matters	9.8	12.4
Shopping	3.3	4.3
Total	100.0	100.0

Note: Trips made by mode of motorized transport

Table 1.5.10 CHANGE IN MODAL COMPOSITION: 1972 – 1985

Unit: %

Mode of Transport	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

Table 1.5.11 GROWTH OF AVERAGE TRIP LENGTH: 1972 – 1985

Unit: km

Mode of Transport	JMATS 1972	ARSDS 1985
Public Transport	6.6	7.4
Private Transport	6.0	6.9

Note: Trips made by mode of motorized transport

1.5.3 EXISTING PROBLEMS OF URBAN TRANSPORTATION

TRAVEL BEHAVIOR OF PEOPLE

According to the analysis of the ARSDS Person Trip Survey, it is very clear at present that differences in income level significantly influence the choice of transport mode in Jakarta. Higher income groups depend on private transport modes to a higher degree. While the high income group prefers private passenger cars, the lower income group, which can not afford automobiles, use motorcycles as a mode of private transportation. As a representative mode of public transportation, 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 transportation has 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.

The low income group, accounting for 47.5% of all Jakarta residents, makes little use of not only private motorized transportation, but also of public motorized transportation. The mobility of the people belonging to this income group is restricted due to their economic situation. Therefore, to satisfy their travel desires it will be necessary to provide an inexpensive public transportation service.

LOW LEVEL OF SERVICE IN EXISTING PUBLIC TRANSPORTATION

The present railway system does not function as an urban railway because of the low level of service, the inconvenient landuse for railway users, and the poor access service to railway stations. The existing bus system lacks reliability as a primary mode of public transportation in terms of rapidity, punctuality and comfort. It can be concluded that the Jakarta Metropolitan Area is not completely served by a mass transit system with large capacity and high speed operation.

LACK OF ROAD AND STREET NETWORK

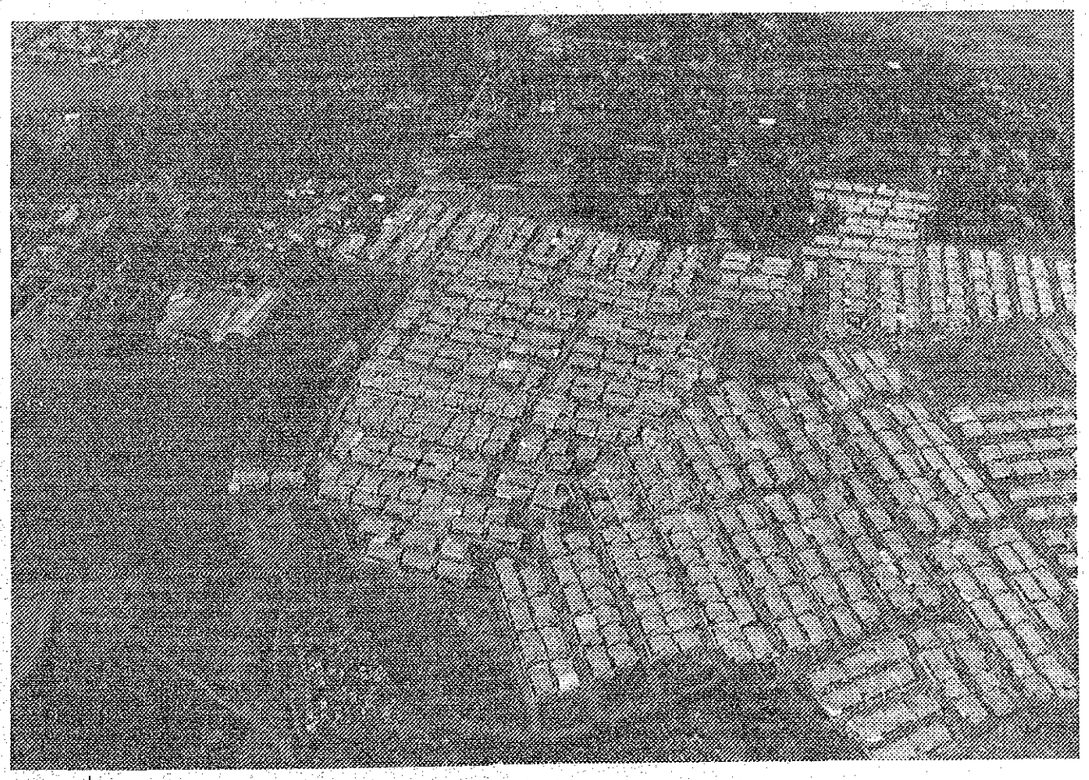
The Jakarta Metropolitan Area suffers from a shortage of roads and streets, and some areas are not covered with major arterial streets. This results in an excessive burden of road traffic on the major arterial streets.

INCONVENIENT URBAN STRUCTURE FOR PUBLIC TRANSPORTATION

At present the urban structure of the Jakarta Metropolitan Area is convenient not for public transportation users, but for private transportation users, due to its ribbon development pattern and the low development density in the areas surrounding transportation terminals.

CHAPTER 2

REVIEW OF EXISTING DEVELOPMENT PLANS

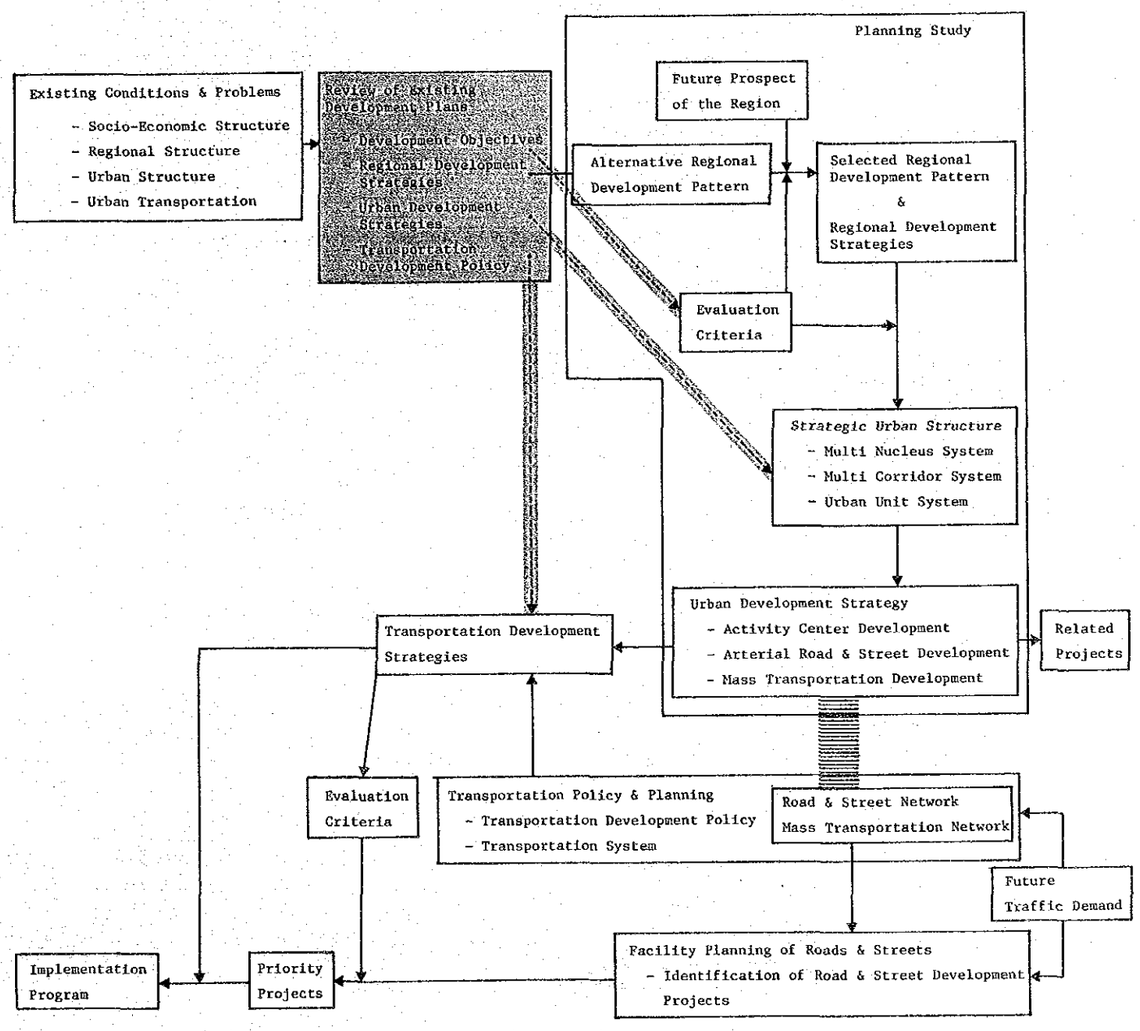


2.1 GENERAL

This chapter will review the existing regional and urban development plans based on the major urban problems identified and analyzed in Chapter 1.

In this review the ARSDS agreed with the regional and urban development objectives. Among the development objectives, the decentralization of human settlements, economic activities and urban functions from DKI Jakarta is placed as the prime policy. However, strong measures to put the policy into action were not found in the existing development plans. Therefore the development strategies and the transportation policy need to be strengthened so as to achieve the development objectives.

Based on this review, the regional and urban development strategies will be examined in Chapter 3 in order to establish a road and street network in the Jakarta Metropolitan Area.



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 as shown in Table 2.2.1. 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.

Table 2.2.1 CHARACTERISTICS OF PAST/CURRENT PLANS AND PLANNING STUDIES RELATED TO JABOTABEK

	JAKARTA MASTER PLAN 1965 - 1985 by U.S. Consultants 1967	JABOTABEK REGIONAL PLANNING by Dutch Consultants 1975	JAKARTA METROPOLITAN AREA TRANSPORTATION PLAN (JMATS) by German Consultants 1975	JABOTABEK METROPOLITAN DEVELOPMENT PLAN (JMDP) by British Consultants 1980	DKI JAKARTA STRUCTURE PLAN 2005 by Local Government 1984
Regional Level		Decentralization of activities from Jakarta to the South - HANKAM : Cijantung - U.I. : Depok - Pipe-line Pertamina: DKI South border Decentralization to other regions - Highway plan (Bina Marga - UNDP) Recommended study - Aquifer recharge zone		Decentralization Policy Priority for development zone (based on ecological study) - East and West development - Restraint of development in the north and south of Jakarta - Sub-regional center development	
Jakarta Urban Level	Concentric Development Mono-centric city structure without sub-centers Settlements: No coordination with potential mass transportation routes Public transportation: Bus system and railway system		Corridor development (radial concentric) 4 stage center hierarchy Settlements: coordination with potential mass transportation routes Public transportation: Rapid Rail Transit System		Decentralization (East and West) Mono-centric city structure with sub-centers (East and West New Centers) Settlements: No coordination with potential mass transportation routes Public transportation: Conventional bus system
Remarks	Major structure: inner ring road outer ring road outer-outer ring road 3 highways	Basis of Presidential Decree to promote the JMDP	Abandoned plan due to lack of viability study on Rapid Rail Transit System	First comprehensive plan and planning basis of DKI Jakarta Structure Plan 2005	Modified, but basically the same road network as JAKARTA MASTER PLAN (1965 - 1985)