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HIGHWAY DEVELOPMENT STUDY  
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FINAL REPORT

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March 1989

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JAPAN INTERNATIONAL COOPERATION AGENCY

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## PREFACE

In response to a request from the Government of Indonesia, the Government of Japan decided to conduct the Ujung Pandang Area Highway Development Study and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Indonesia a study team headed by Dr. Kaoru Ichihara, comprised of members from Central Consultant Inc. and Chodai Co., Ltd. from December, 1987 to March 1989.

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

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

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

March, 1989



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Kensuke Yanagiya  
President

Japan International Cooperation Agency





LETTER OF TRANSMITTAL

March, 1989

His Excellency Mr. Kensuke Yanagiya  
President  
The Japan International Cooperation Agency  
Sinjuku Mitsui Building  
Nishi Shinjuku 2-1  
Shinjuku-ku, Tokyo  
Japan

Dear Mr. President:

It is my great pleasure to submit herewith the Report of the Study on Ujung Pandang Highway Development in the Republic of Indonesia.

This report is the result of studies carried out by the Study Team consisting of the Central Consultant Inc. and Chodai Co., Ltd. of Japan. During the service period, the Study Team conducted the road and various traffic surveys for the urban road network and prepared the Master Plan of arterial highway development in the Study Area to solve the various urban traffic problems.

The Study Team has completed the above service with a firm belief that implementation of above plans will substantially contribute to the improvement of the very serious road traffic problems in Ujung Pandang Area, in particular the heavy traffic congestion and frequent occurrence of traffic accidents.

Our gratitudes are due to the Japan International Cooperation Agency, the JICA Advisory Committee, Ministry of Foreign Affairs, Embassy to Indonesia as well as officials and individuals of Indonesia for their assistance extended to the Study Team.

In conclusion, the Study Team sincerely hopes that the study results would contribute to socio-economic development and well-being in general and to the future highway network development in the country.

Yours sincerely,



---

Kaoru Ichihara  
Team Leader  
Ujung Pandang Area  
Highway Development Study  
( Central Consultant Inc.)



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## CHAPTER 1 INTRODUCTION



## CHAPTER 1 INTRODUCTION

### 1.1 General

Ujung Pandang, situated at the southern part of Sulawesi island, facing the Straits of Makassar, is the seventh largest city in Indonesia at present and is expected to grow further as the development core of the East Indonesia.

Ujung Pandang area is already encountering various urban transport problems, and these problems are anticipated to be enlarged in the near future. In addition, the recent sprawling trend of the urbanized area is making the situation more disordered.

In this connection, the Government of the Republic of Indonesia requested the Government of Japan to conduct the Ujung Pandang Area Highway Development Study (hereinafter referred to as "the Study").

In response to the request, the Government of Japan, through the Japan International Cooperation Agency (JICA), sent a study team to carry out the Study in close cooperation with the Indonesian counterpart team.

The Study commenced in December, 1987, when the Inception Report for the Study was submitted and accepted by the Government of the Republic of Indonesia through the meetings at local as well as central level.

The Interim Report (1) contains the progress of the Study in the first stage since the commencement, which mainly comprises collection of data and information on the existing conditions, was submitted and accepted by the Government of the Republic of Indonesia on the end of March, 1988.

The Interim Report (2) contains the progress of the Study in the second stage, which mainly comprises traffic projection, identification of planning strategy and concept, and preparation of plans for long term and short term improvement plan. It was submitted and accepted by the Government of the Republic of Indonesia on the middle of October, 1988.

The Draft Final Report contains the contents of Interim Reports (1) and (2), implementation program and recommendations. It was submitted and accepted by the Government of the Republic of Indonesia on the end of December, 1988.

## 1.2 Objective

The objective of the Study is to formulate a Master Plan for Highway Development in Ujung Pandang Area, with special emphasis on the development of a road network in the long term and improvement of road traffic in the short term, based on urban development strategies.

## 1.3 Study Area

The Study Area, as is stipulated in the Inception Report, covers the city of Ujung Pandang and its surrounding area within the radius of approximately 30 km from Ujung Pandang central area.

In the actual surveys carried out in this stage, survey area and survey points have been established based on the needs of each survey. In this respect, careful consideration has been given to the reasonable selection of the area and points in order to adequately meet the survey purpose and to depict the existing situation of the Study Area.

## 1.4 Target Year

The year 2009 is defined as the target year for long term prospect of the Study, and the year 1994 be defined as the target year for the short term.

## 1.5 Progress to Date

As indicated in the Study Flow Chart in Fig. 1.5.1, the activities are divided into three stages i.e. stage 1, stage 2 and stage 3.

The stage 1 study which mainly conducted various traffic survey, data collection and its analysis and identification of existing traffic problems was commenced in December 1987 and was completed in March 1988.

The stage 2 study, which was conducted mainly for future traffic projection and preparation of long term and short term improvement plans, was commenced in June 1988 and completed in October 1988.

The stage 3 study, which is conducting mainly to identify high priority projects and implementation program for the study, was commenced in November 1988 and will be completed in March 1989 when the Final Report will be submitted to the Indonesian Government.

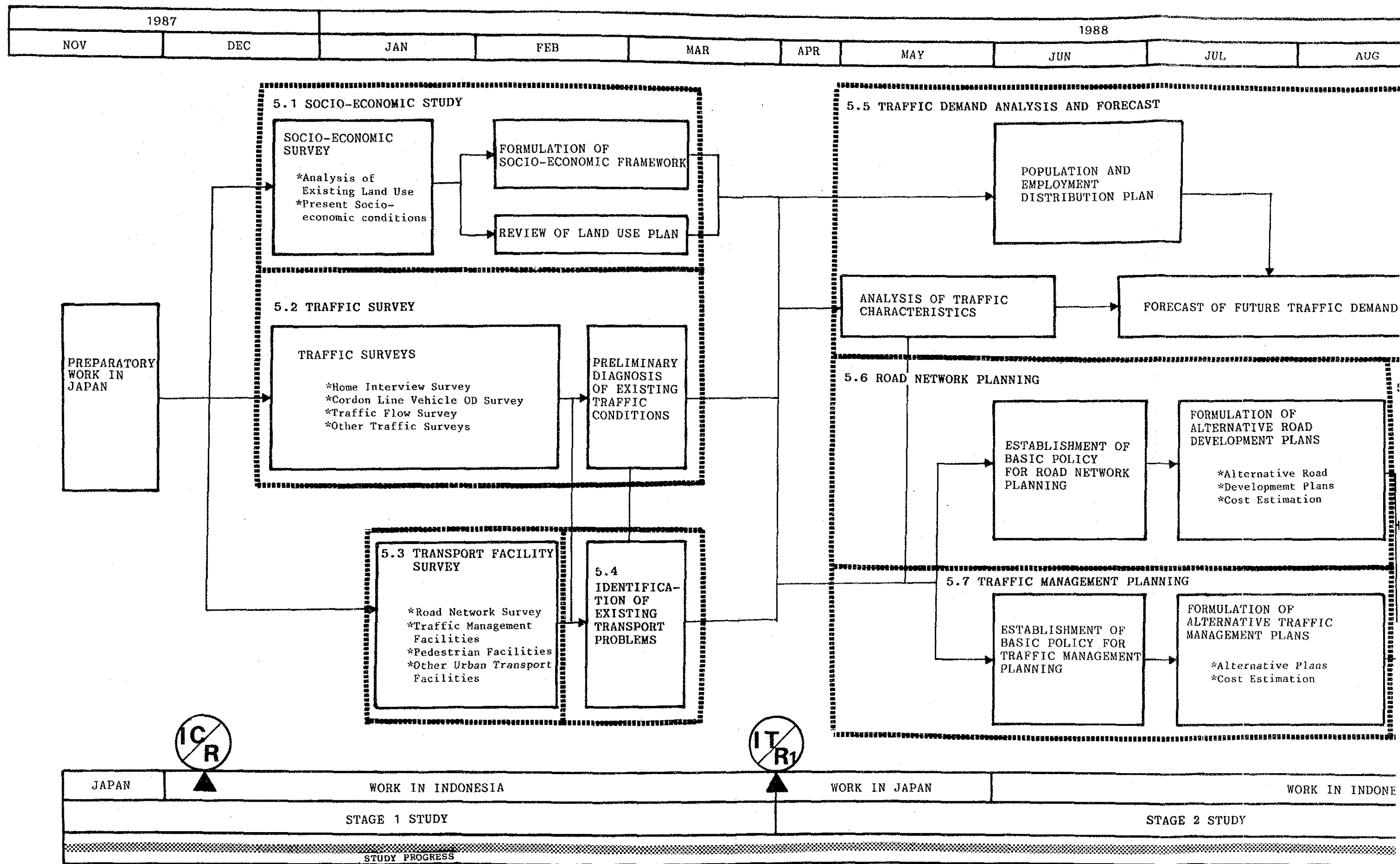
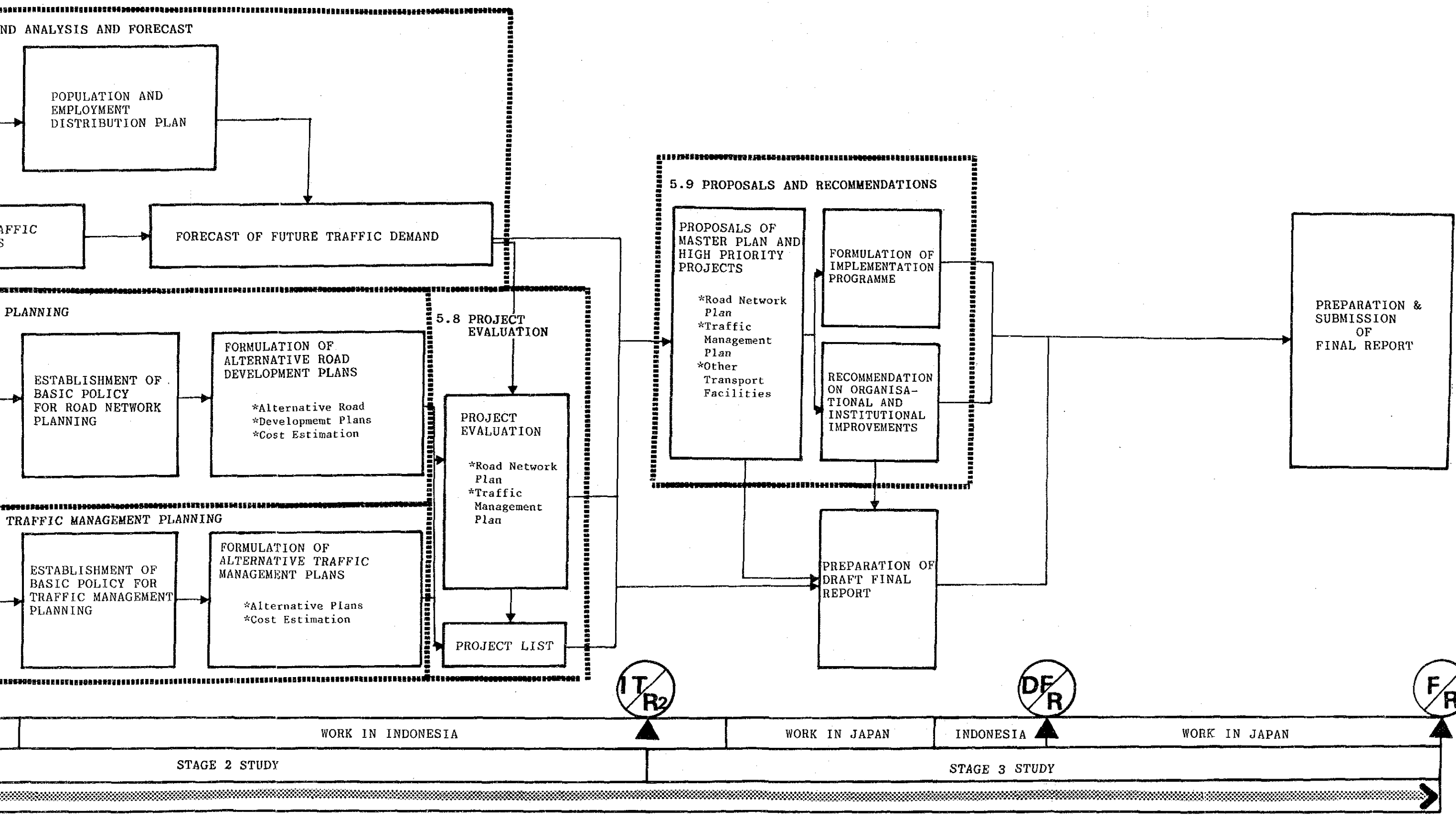


Fig. 1.5.1 Study Flow Chart

1988						1989			
JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR





The major activities conducted in the stage 1, stage 2 and stage 3 studies are illustrated in Fig. 1.5.1. The progress to date of this Study are shown below:

- 1) The Inception Report was submitted and accepted by the Indonesian Government in December 1987.
- 2) The Interim Report (1) was submitted and accepted by the Indonesian Government in March 1988.
- 3) The Interim Report (2), which mainly comprises the future traffic volume forecasted, preparation of improvement plans and identification of the project list, was submitted to the Indonesian Government on beginning of October 1988.
- 4) The Draft Final Report is submitted and accepted by the Indonesian Government on the end of December 1988.
- 5) The Final Report is submitted to the Indonesian Government on the end of March, 1989.

## 1.6 Study Organization

In response to the requirement stated in the Scope of Work, JICA appointed a Study Team to carry out the Study in close collaboration with a Counterpart Term.

Furthermore, JICA organized an Advisory Committee, composed of professor and Japanese Government officials, who advise the Study Team on principles and relevant policy matters.

The organization chart of the Study is shown in Fig. 1.6.1.

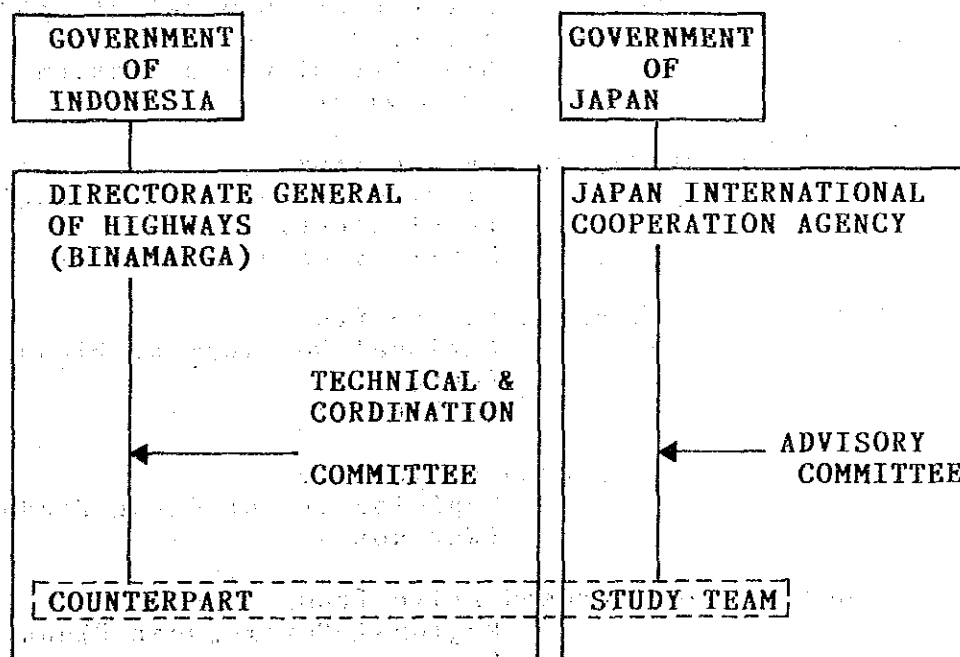


Fig. 1.6.1 Organization Chart



The committees are made up of the following:

1) Technical and Coordination Committee

Muhammad Solechan (chairman) Director of Urban Road Planning,  
Directorate General of Highways  
Ministry of Public Works.  
(Bina Morga)

Sutrisno Ruslan Deputy Director of Urban Road  
Planning,  
Directorate General of Highway  
Ministry of Public Works  
(Bina Marga)

Muksin Chief of Urban Highway Planning  
Directorate General of Highway  
Ministry of Public Works  
(Bina Marga)

Bambang Heryanto Director,  
Local Development Planning Board  
(Bappeda TK II)

Head of or Representative from  
Directorate General of Human  
Settlements,  
Ministry of Public Works  
(Cipta Karya)

Head of or Representative from  
Directorate General of Land  
Transport,  
Ministry of Communication  
(PHB Darat)

Head of or Representative from  
Directorate General of Regional  
Development,  
Ministry of Home Affairs

Head of or Representative from  
National Development Planning  
Board  
(BAPPENAS)

Head of or Representative from  
Municipality of Ujung Pandang  
(Warikota)

Head of or Representative from  
Regional Development Planning  
Board  
(Bappeda TK.I)

Head of or Representative from  
Provincial Public Works/Kanwil  
(KPDUP/Kakanwil)

Head of or Representative from  
Local Development Planning  
Board  
(Bappeda TK II)

Head of or Representative from  
Regional Road Betterment  
Office  
(RBO)

Head of or Representative from  
Provincial Land Transport  
Office  
(Kankanwil PHBD)

2) Advisory Committee, Japanese Government

Katsutoshi Ota Associate Professor,  
Department of Urban Engineering  
University of Tokyo

Hiroshi Yamano Ministry of Construction  
(Regional Planning)

Akiyoshi Shimojo Public Works Department  
(Traffic Planning) Osaka Prefectural Government

Yoshiaki Mizumoto Kansai Airport Co., Ltd.  
(Road Planning)

Katsumi Otani Social Development Cooperation  
(Coordination) Development  
Japan International Cooperation  
Agency

3) Study Team

Kaoru Ichihara Team Leader

Koichi Tsuzuki Deputy Team Leader/Highway Planner

Toshisada Katsurada  
Transport Planner

Ruji Matsumoto City & Regional Planner

Kenichi Sekine Traffic Engineer

Akira Kaminaga Traffic Management Specialist

Hikaru Nishimura Highway Facility Planner

Shin Kokubo Economist

Kunitsugu Ogo System Analyst

4) CounterPart Engineer

Syahmansyah Directorate General of Highways,  
Ministry of Public Works

Budi Harima Wan S. Directorate General of Highways,  
Ministry of Public Works

Imade Benyamin Hasanuddin University, Ujung Pandang

Ananto Yudono Hasanuddin University, Ujung Pandang

Herman Parung Hasanuddin University, Ujung Pandang

Siddik Hananuddin University, Ujung Pandang

Samudra Usman Nassa Municipality of Ujung, Pandang

## CHAPTER 2 PRESENT TRANSPORT CONDITION AND ITS PROBLEMS



## CHAPTER 2 PRESENT TRANSPORT CONDITION AND ITS PROBLEMS

### 2.1 Conducted Traffic and Transport Facilities Survey

#### 2.1.1 General

The traffic and transport facilities survey was conducted for analyzing the present traffic conditions and forecasting future traffic demand, and for analyzing present transport facilities problems.

The above mentioned traffic and transport facilities survey were carried out during three (3) months period from December 1987 to February 1988 by the study team. The surveyors for traffic and transport survey were employed from Hasanuddin University and other universities.

#### 2.1.2 Conducted Survey Items

The following five (5) different types of traffic survey were planned and carried out in cooperation with concerned authorities including police agencies.

- (1) Home interview survey
- (2) Cordon line O-D survey
- (3) Traffic flow survey
- (4) Public transportation survey
- (5) Company and government office survey

The above mentioned traffic surveys are summarized in Table 2.1.1. and the survey area and the traffic zoning maps are illustrated in Fig 2.1.1 and Fig 2.1.2 respectively. On the other hand, the following five (5) different types of transport facilities survey were planned and carried out also in cooperation with concerned authorities.

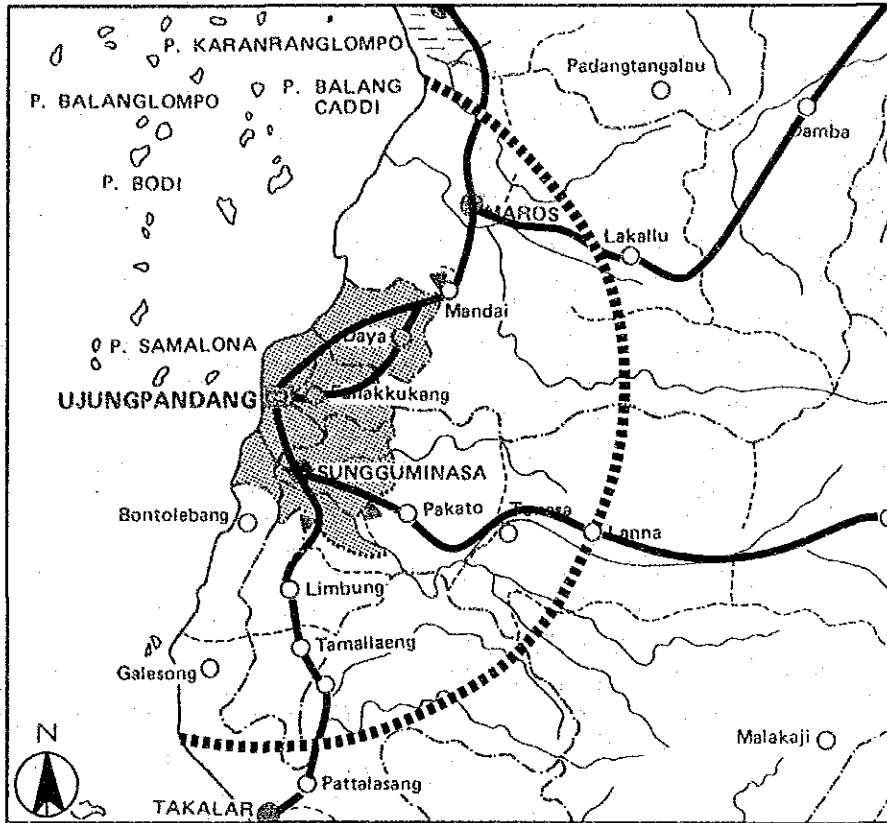
- (1) Road inventory survey
- (2) Traffic signal survey
- (3) Pedestrian facility survey
- (4) Parking condition survey
- (5) Bus stop and terminal survey

The above mentioned surveys were carried out mainly within Ujung Pandang City and conducted survey items and it's contents are illustrated in Table 2.1.2.

Table 2.1.1.1 Summary of Traffic Surveys

Survey	Items	No. of counting stations and samples by survey period
1. Home Interview Survey		4100 samples for Ujung Pandang/Sungguminasa (Main Survey Area)
		590 samples for the surrounding part of the Main Survey Area within the study area.
2. Cordon Line Roadside O-D Survey		Three (3) stations : 12 hours (7:00 a.m - 7:00 p.m)
	Interview	Sampling Rates : 13 - 39%
	Cordon Line	Four (4) stations : 12 hours (7:00 a.m - 7:00 p.m)
	Count	
3. Traffic Flow Survey	Traffic Vol. Count	Twelve (12) stations: 12 hours (7:00 a.m - 7:00 p.m)
	Intersection	Two (2) stations : 24 hours
		Three (3) stations : 12 hours (7:00 a.m - 7:00 p.m)
	Traffic Vol. Count	Five (5) stations : 4 hours in peak hours (7:00 a.m - 9:00 a.m, 16:00 p.m - 18:00 p.m)
	Travel Speed Survey	Eleven (11) routes for passenger car/jeep and bus in peak hours
		Seven (7) routes for becak
4. Public Transportation Survey		38 bus companies in Ujung Pandang
5. Company and Government Survey		110 samples in Ujung Pandang

Source: JICA Study Team, 1988






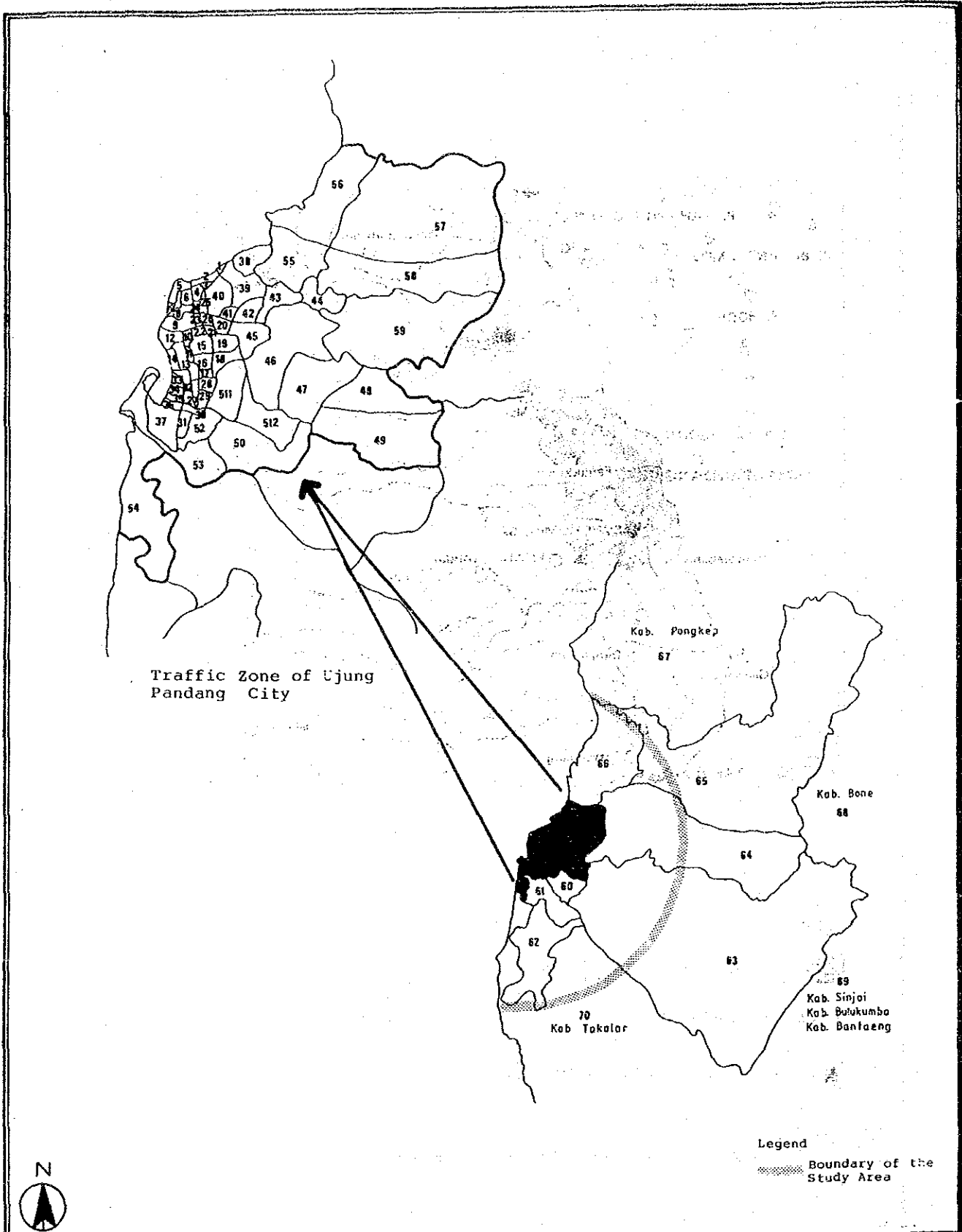
- Legend
-  : Main Home Interview Survey Area
  -  : Study Area
  -  : Cordon Line Vehicle OD Survey Station

Fig. 2.1.1 Location of Cordon Line Survey Stations





**UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY**

**Fig.  
2.1.2**

**Traffic Zone of Ujung Pandang City**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

Table-2.1.1.2 Summary of Transport Facility Surveys

Survey Item	Survey Stations	Survey Contents
1. Road Inventory	Forty (40) stations at major roads in Ujung Pandang	<ul style="list-style-type: none"> <li>- Road Width</li> <li>- Pavement Conditions</li> </ul>
2. Traffic Signal	Twenty One (21) signalized intersections in Ujung Pandang	<ul style="list-style-type: none"> <li>- Type of signal</li> <li>- Signal phase</li> <li>- Condition</li> </ul>
3. Pedestrian Facilities	Six (6) roads with sidewalk Four (4) stations of pedestrian overpass Major roads in urban area	<ul style="list-style-type: none"> <li>- Sidewalk width</li> <li>- Pavement condition of sidewalk</li> <li>- Pedestrian overpass condition</li> <li>- Location of cross walk</li> </ul>
4. Parking	Eleven (11) major roads and CBD (Surrounding Jl. Martadinata, Jl. Satando, Jl. Yos Sudarso, Jl. Bandung, and Jl. Bawakaraeng	<ul style="list-style-type: none"> <li>- Location of on/off-street parking space</li> <li>- On/off-street parking area</li> <li>- Usage condition of on/off street parking</li> <li>- Location of parking prohibited zone</li> </ul>
5. Bus Terminal	Eighteen (18) bus terminals in study area	<ul style="list-style-type: none"> <li>- Area</li> <li>- Function</li> <li>- Capacity if available</li> <li>- Number of bus and pete-pete if available</li> </ul>

## 2.2 Present Traffic Conditions

### 2.2.1 Existing Traffic Volume

As the results of traffic volume counting survey, the twelve (12) hour-traffic volume (7:00 a.m. - 7:00 p.m.) is presented in Fig 2.2.1. This figure contains the traffic volume data obtained by the intersection traffic volume count.

The heaviest traffic volume is recorded on Jl. Gowa Jaya (Urip Sumoharjo) (20,000-24,000 veh/12hr for 4-wheel vehicles and 17,000-32,000 veh/12hr for motorcycle/becak). Jl. Veteran and Jl. Sudirman which connect the northern and southern parts of Ujung Pandang, also carry heavy traffic (13,000-17,000 veh/12hr for 4-wheels and 20,000-28,000 veh/hr for motorcycle/becak, and 12,000-23,000 veh/12hr and 13,000-16,000 veh/12hr respectively).

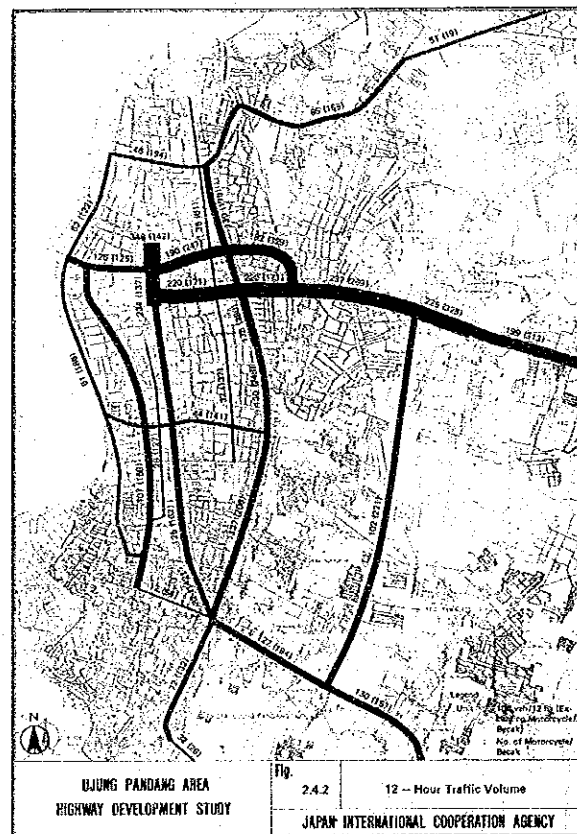


Fig. 2.2.1 12 - Hour Traffic Volume

### 2.2.2 Hourly Traffic Volume Fluctuation

The morning peak hour occurs between 7:00 a.m. to 8:00 a.m. on both Jl. Gowa Jaya (Urip Sumoharjo) and Jl. Veteran. Traffic volume in the morning peak hour on Jl. Gowa Jaya (Urip Sumoharjo) is approximately 5,200 veh/h, of which 1,800 vehicles are of 4-wheel vehicles and 3,400 are of motorcycle/becak, while on Jl. Veteran 3,600 veh/hr is counted comprising approximately 1,100 veh/hr of 4-wheels and 2,500 veh/hr for motorcycle/becak.

The evening peak hour on Jl. Gowa Jaya (Urip Sumoharjo) is recorded between 4:00 p.m. and 6:00 p.m. while on Jl. Veteran it is between 5:00 p.m. to 6:00 p.m. The evening peak hour ratios of the daily traffic volume on both roads are lower (7.1% - 8.1%) than those of the morning (8.3% - 8.6%). The hourly traffic volume on Jl. Veteran is shown in Fig 2.2.2.

In addition, the traffic volume counting survey was carried out in rainy season of January, 1988 and in dry season of July, 1988 to find out the seasonal traffic volume fluctuation between rainy season and dry season. As a result of this survey, the seasonal traffic volume fluctuation is found not significant.

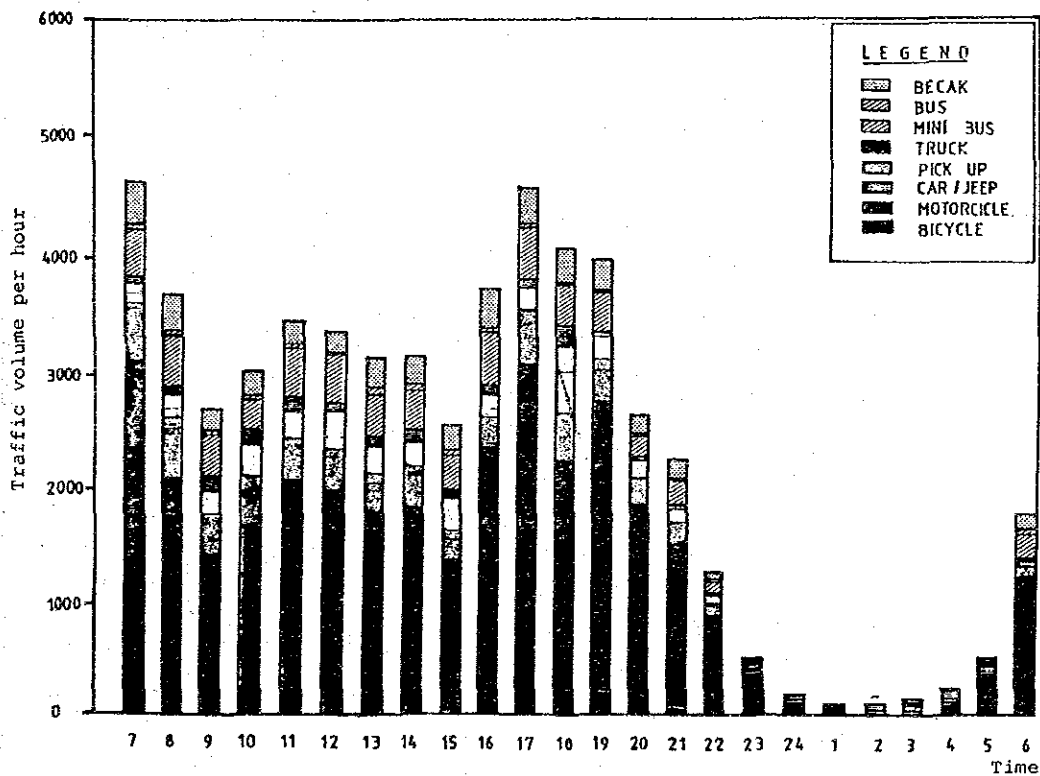
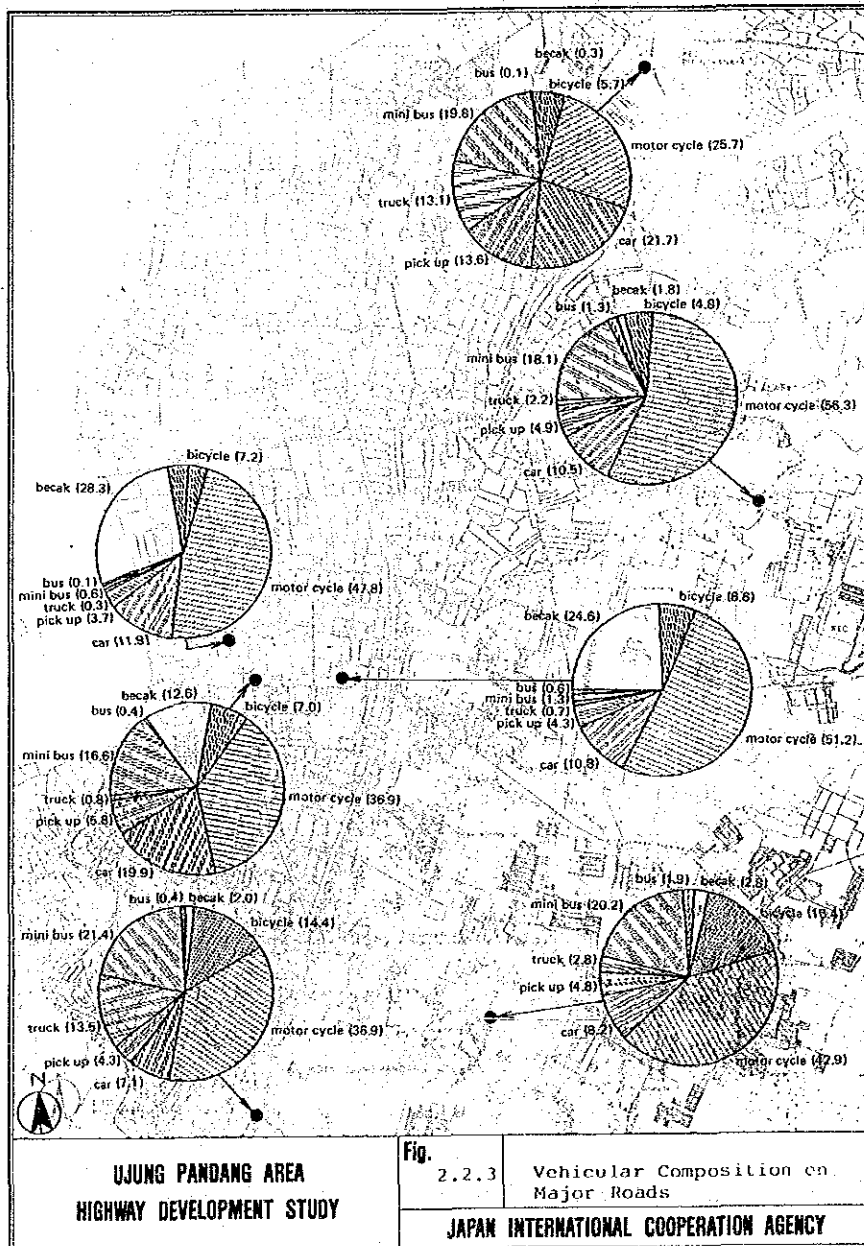


Fig. 2.2.2 Hourly Traffic Volume on Jl. Veteran (Station No. 10)

### 2.2.3 Vehicular Composition

Vehicular compositions on the typical major roads are presented in Fig. 2.2.3. These compositions are calculated from 12 hour-traffic volume count data including bicycles being used in some areas as a major travel mode.

According to this figure, approximately 30% - 50% of total traffic volume on all the counted roads are motor-cycles, followed by 15% - 25% becaks, 15% - 20% mini buses, 10% - 15% passenger car/jeeps, 10% - 15% bicycles and the remaining 5% - 6% of other vehicles.



### 2.2.4 Intersection Traffic Volume

The intersection traffic volume diagrams were drawn for morning peak hours in the central area where the survey stations No. 1 - 6 were included, as shown in Fig. 2.2.4. The figure shows the directional movement and its volume with arrow lines whose width is in proportion to traffic volume.

It is observed that the main traffic flow at station No. 1 and No. 2 is north-south direction, while at other intersections the main traffic flow is east-west direction. The main traffic flow at these intersections remain unchanged in the morning and evening peak hours.

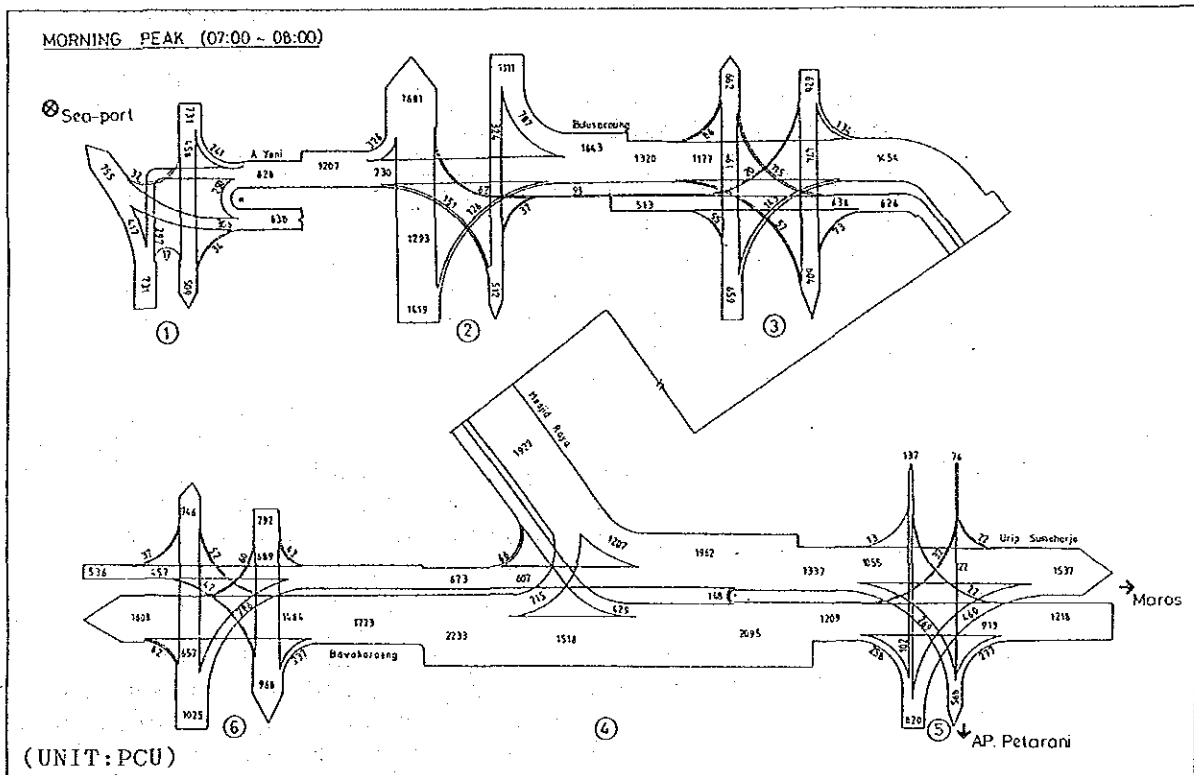


Fig. 2.2.4 Intersection Traffic Volume Diagram

## 2.2.5 Home Interview Survey

### 1) General

The objective of the Home Interview Survey in this study is to grasp the existing conditions of motor vehicle trips. Since the vehicle ownership rate is fairly low in the Study area at present, the survey was made on person trips instead of vehicle trips.

The contents of the interview consist of the following items :

- a) Survey items concerning household
  - Number of household members
  - Household income
  - Vehicle ownership
  - Vehicle trip information
  - Trip movement of daily life
- b) Survey items concerning personal conditions
  - Sex
  - Age
  - Occupation/Status
  - Working address/School address
- c) Survey items concerning person trips
  - Number of trips/day
  - Origin-destination
  - Trip purpose
  - Facilities at origin/destination
  - Departure/arrival time
  - Transportation mode

The survey area comprises the whole area of Kotamadya (Municipality) of Ujung Pandang and two kecamatans (district) of Sombaopu and Pallangga in Kabupaten (Regency) Gowa including Sungguminasa.

### 2) Sampling

The numbers of population and household in the survey area are 888,700 persons and 158,200 families as of 1986. The target number of samples was 3,700 households, about 2.3 % of the total. The interview was carried out in January 1988, by visiting the sampled households.

As a result, the total number of household actually interviewed is about 4,100 which exceeded the target number of samples (3,700).

**Table 2.2.1 Sampling Rate**

Area	Total No. of Household	Sampled Household	Sampling Rate
Ujung Pandang	138,460	3,570	2.6 %
Sombaopu/Pallangga	19,789	508	2.6 %
Total	158,249	4,078	2.6 %

### 3) Data Processing

The results of the Home Interview Survey are processed by using computer according to the procedure shown in Fig. 2.2.5.

Since the Home Interview Survey is a sample survey, the results are to be expanded by zone. Although the sampling was done by household, the expansion factor was calculated by using the ratio of the collected number of sampled persons to the total population of the people who are 7 years old and above, taking into account the sex composition and age structure.

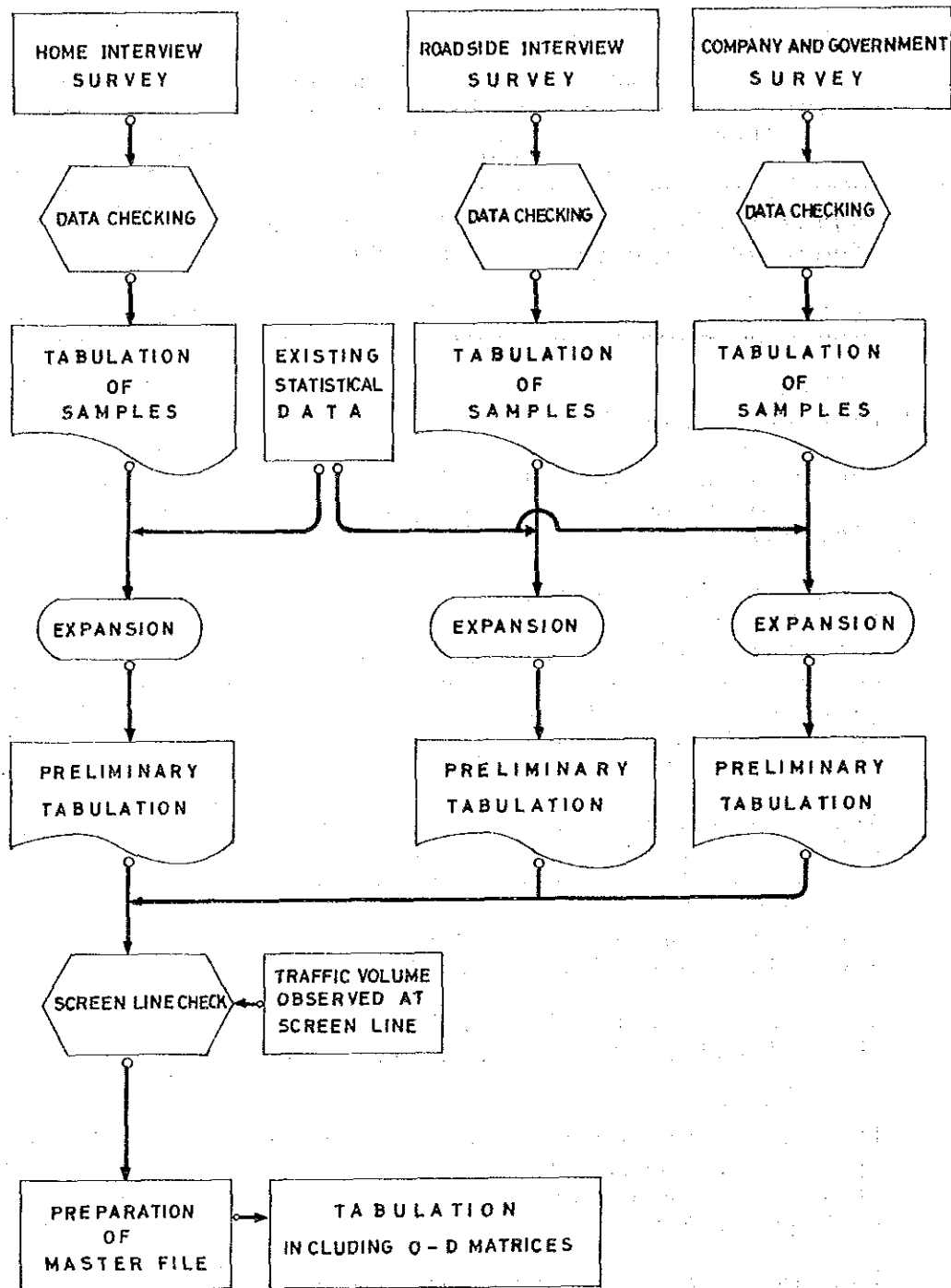
After expanding the survey results, the person trip O-D table in the Study area was tabulated. This O-D table can be checked by comparing it with the traffic volume observed at the two screen lines defined as a line parallel with Jl. Andi Pettarani in the N - S direction and a line near Jl. Monginsidi in the E - W direction.

As a result of the comparison of the two survey results, the following adjustment is made for the person trip O-D table.

The trips by the vehicles for passenger use i.e. bicycles, motorcycles, automobiles, buses and minibuses should be multiplied by 1.1 and those by trucks and pickups by 2.0.

The adjusted traffic volume on the screen lines are shown in Table 2.2.2.





UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY

Fig.  
2.2.5

Data Processing of Person Trip Survey  
Results

JAPAN INTERNATIONAL COOPERATION AGENCY

Table-2.2.2 Traffic Volume on Screen Line

	Ave. Vehicle Occupancy (person/veh)	1) Screen		2) Screen	
		N - S	E - W	N - S	E - W
		Person trip/day	Vehicle trip/day	Person trip/day	Vehicle trip/day
Bicycle	1.12	11,219	10,017	12,035	10,746
Motorcycle	1.58	100,016	63,301	174,782	110,622
Passenger car	3.27	44,177	13,510	86,243	26,374
Pick - Up	2.20	16,297	7,408	24,210	11,005
Truck	3.00	13,264	4,421	8,201	2,734
Mini Bus	5.95	149,552	25,135	133,635	22,460
Bus	12.27	14,699	1,198	11,964	975
Becak	2.12	3,866	1,824	22,942	10,822
Total	-	353,090	113,814	474,012	195,738

Source : 1) Bus Occupancy Survey, Road side Interview Survey, and Company and Office Survey

2) Estimated from Home Interview Survey

#### 4) Transport Demand Characteristics

##### a) Existing Transport Demand

From the Home Interview Survey, the total number of person trips in the main study area is estimated to be 2,135,950 trips per average week day. 98.4 % of these trips i.e. 2,101,224 trips are made by the residents in Ujung Pandang and Sungguminasa areas.

Generally, a trip is defined by a linked trip, where transfers within a trip are not taken into account. Out of these persons trips, about 73,500 trips representing 3.4 % of the total are to/from outside the main study area (refer to Fig. 2.2.6). Only about 1,000 trips pass through the area from outside to outside.

##### b) Transport Demand by Purpose

Transport demand by purpose is shown in Table 2.2.3. Among the five trip purposes, "To home" has the largest share with 47.8 %, followed by "Private" with 20.9 % and "To school" with 17.9 %. "TO work" and "Business" trips make up only 10.7 % and 2.7 % respectively.

**Table 2.2.3 Existing Transport Demand by Purpose**

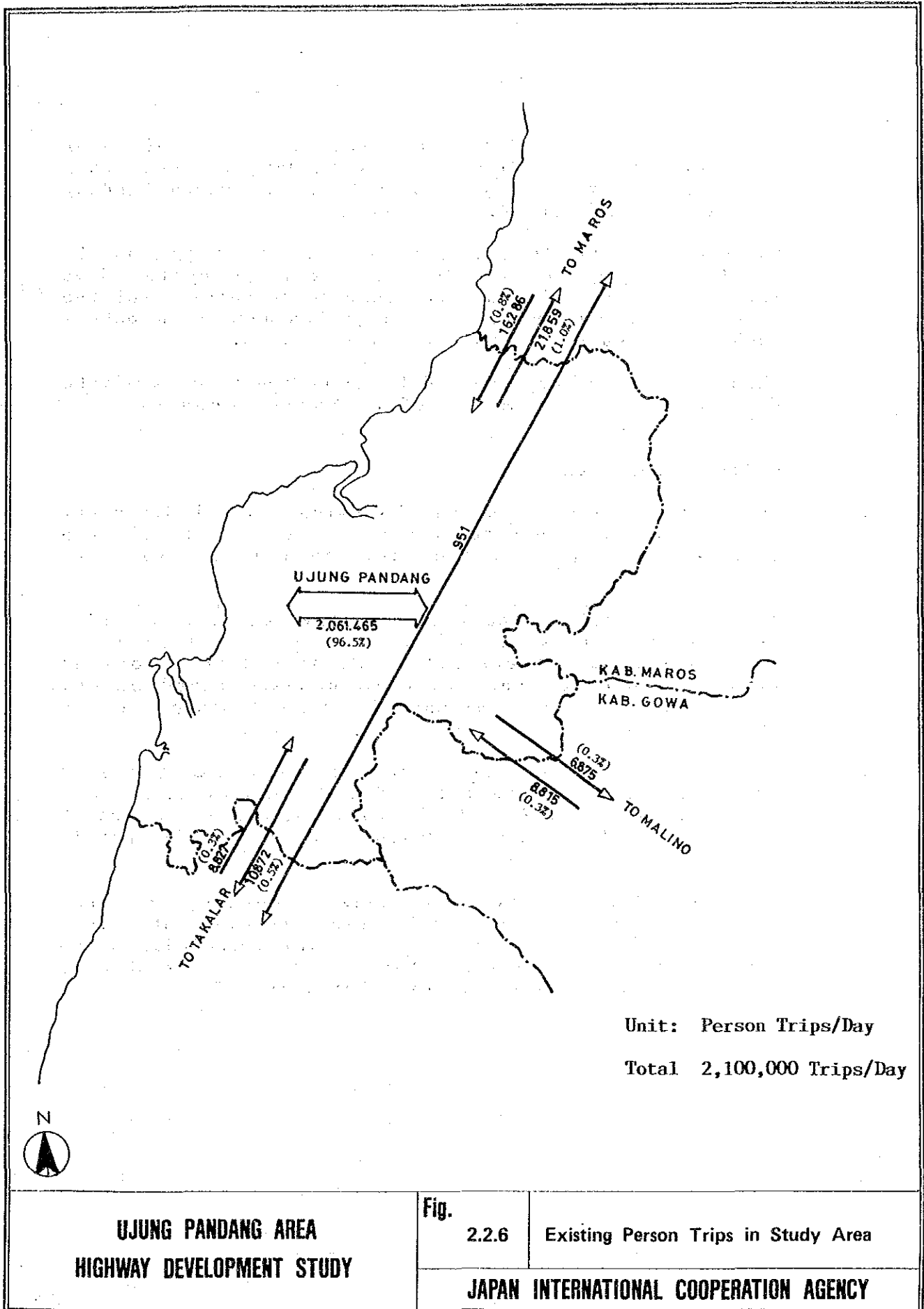
Trip Purpose	Person Trips (trips/day)	Composition Rate (%)
To work	224,248	10.7
To school	376,172	17.9
To home	1,003,608	47.8
Business	57,003	2.7
Private	440,193	20.9
Total	2,101,224	100.0

When compared with other cities like Jakarta or Surabaya, "To school" and "Private" trips seem to be relatively high and "To work" relatively low.

These phenomena might be attributed by the following:

- (1) The ratio of students to total population in Ujung Pandang is extremely higher than other cities; the ratio in Ujung Pandang is about 35 %, while only 20 % in the case of DKI Jakarta.

The ratio of sampling of students in the Home Interview Survey is about 40 %. This sampling ratio is big enough to reflect characteristics of traffic flow of students in the Study area.



- (2) Labor force activity rate i.e. the ratio of labor force to population in Ujung Pandang is lower than Jakarta or Surabaya; about 29 % for Ujung Pandang while 34 % for DKI Jakarta.

With regard to "Business" trips, it is generally difficult to grasp all the business trips by the Home Interview Survey, because the sampled households for the interview seldom include the high business trip makers such as pete-pete, becak or truck drivers.

These trips are supplemented by using the results of the Company and Government Office Survey conducted in February 1988.

#### c) Modal Composition

In general, a trip is made by using several different modes, however, the modal use is usually expressed by a representative mode of them used in the trip for convenience sake.

In order to define the representative mode, a priority is given to each mode. The first priority is given to motorized public transport, the second to motorized private vehicles, the third to non-motorized means. Modal choice by the residents in Ujung Pandang area is shown in Table 2.2.4.

Modal choice in the Study area can be classified into three types of transport mode. Non-motorized modes represent about 31.2 % of the total person trips, which count 44.6 % for private modes and 24.2 % for public modes.

The highest modal choice is made by motorcycles with 29.8 % of the total trips reflecting the high motorcycle ownership. The second is mini bus, which includes pete-pete and microlet, counting for 23.1 %. Walk, ranked as the third, also has a large share, 19.0 %.

**Table-2.2.4 Present Modal Composition**

Mode	Sub - mode	Person Trips (trips/day)	% share to Sub Total	% share To Total
Non- Motorized	Walk	398,576	60.8	19.0
	Bicycle	76,032	11.6	3.6
	Becak	180,634	27.6	8.6
	Sub Total	655,242	100.0	31.2
Private	Motorcycle	625,854	66.7	29.8
	Passenger car	231,671	24.7	11.0
	Pick up	73,771	7.9	3.3
	Truck	7,103	0.7	0.3
	Sub Total	938,399	100.0	44.6
Public	Mini bus	485,188	95.6	23.1
	Bus	22,395	4.4	1.1
	Sub Total	507,583	100.0	24.2
Total Person Trips		2,101,224	--	100.0

These three modes make up more than 70 % of the total person trips in the Study area.

Other prominent characteristics are :

- (1) Becak is fairly used by the residents, counting for 8.6 % of the total, which is much higher than the case in Jakarta.
- (2) Motorized public transport use is comparatively at a low level when compared with Jakarta or Surabaya. This implies that public transport system in the Study area is not sufficiently developed and that considerable portion of the public transport demand is met by either becak service or motorcycle use.

d) Modal Composition by Trip Purpose

Fig. 2.2.7 shows the modal composition by trip purpose. For "Work" and "Business" trips, private vehicles, particularly motorcycles and passenger cars have outstanding shares, while walk and becak use are much less compared with other trips.

On the other hand, in the case of "School" trips, the importance of mini bus, becak and walk remarkably increases. This is due to the fact that most of "School" trip makers are pupils who are commuting to the primary or junior high schools usually located near their residences.

As for private trips, all the typical modes in Ujung Pandang are widely used, though there seem to be some inclination to use private vehicles and becak. This is because private purpose may include various sub-purposes such as shopping, recreation, social, etc.

Fig. 2.2.8 shows the composition of trip purposes by transport mode. It can be seen that each mode is used in a different way and is characterized by the percentage share of business and private trips.

In the case of pick-ups and trucks, their use for business and private purposes is highest among the various modes. Other modes are used less for business; the share being less than 5 %. Bus and minibus are used mainly for daily trips such as work, school and home with the percentage share exceeding 80 %.

#### e) Trip Production Rate

The trip production rate of the Ujung Pandang area is estimated to be 2.88 person trips/day in terms of gross rate and 3.03 in net rate. Trip production rate varies by personal characteristics such as sex, age, status/occupation, vehicle ownership income, etc.

Fig. 2.2.9 - Fig.2.2.13 show the trip production rate by personal characteristics. Trip production rate is found to correlate well particularly with status, vehicle ownership and household income.

#### f) Trip Generation and Attraction

For the trip purposes of "To work", and "To school" and "Private", the trip generation is mainly dependent on the number of residents in the corresponding zone, while the trip attraction is largely related to the socio-economic activities. On the contrary, in the case of "To home", the attraction is dependent on the number of residents.

As for "Business", both the generation and attraction may be influenced by the economic activities. Accordingly, trip attraction shows the zonal characteristics more appropriately than trip generation.

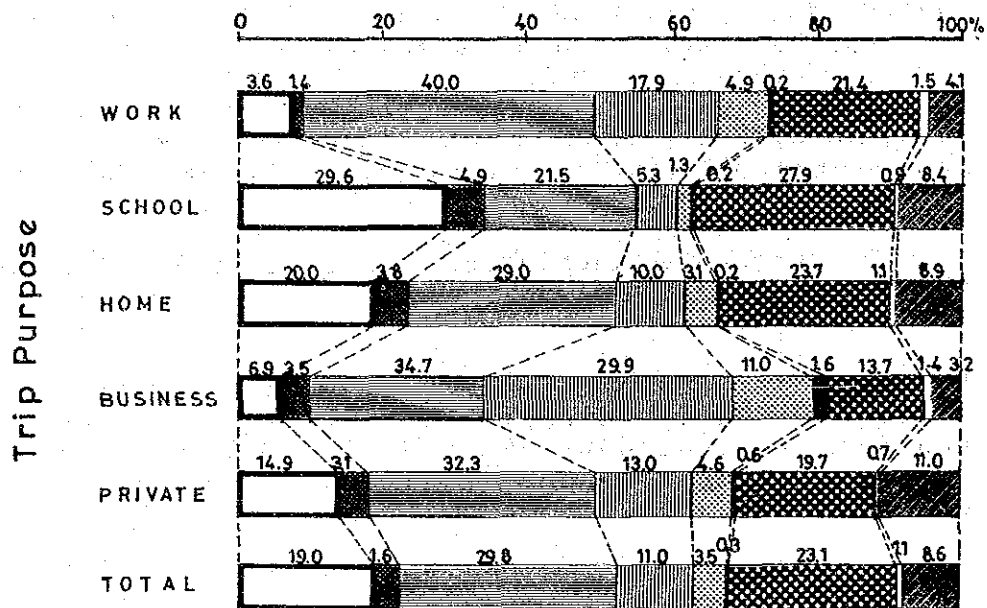
Fig. 2.2.14 shows trip attraction by Kecamatan. Kecamatan Wajo, Ujung Pandang and Panakukang have relatively many working opportunities, while Kecamatans Tallo, Mariso and Pallangga have few working places.

As for "School", Kecamatans Ujung Pandang, Panakukang and Biringkanaya attract relatively large number of school trips.

For "Private" purpose, the attraction to the central district such as Kecamatans. Wajo, Ujung Pandang and Bontoala is prominent. This is because lots of urban amenities such as shops, markets, amusement centers, etc., are concentrated in this area.



### Trip Mode in Percentage



**LEGEND :**

- W A L K
- BICYCLE
- MOTORCYCLE
- PASS. CAR
- PICK UP
- TRUCK
- MINI BUS
- B U S
- BECAK

**UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY**

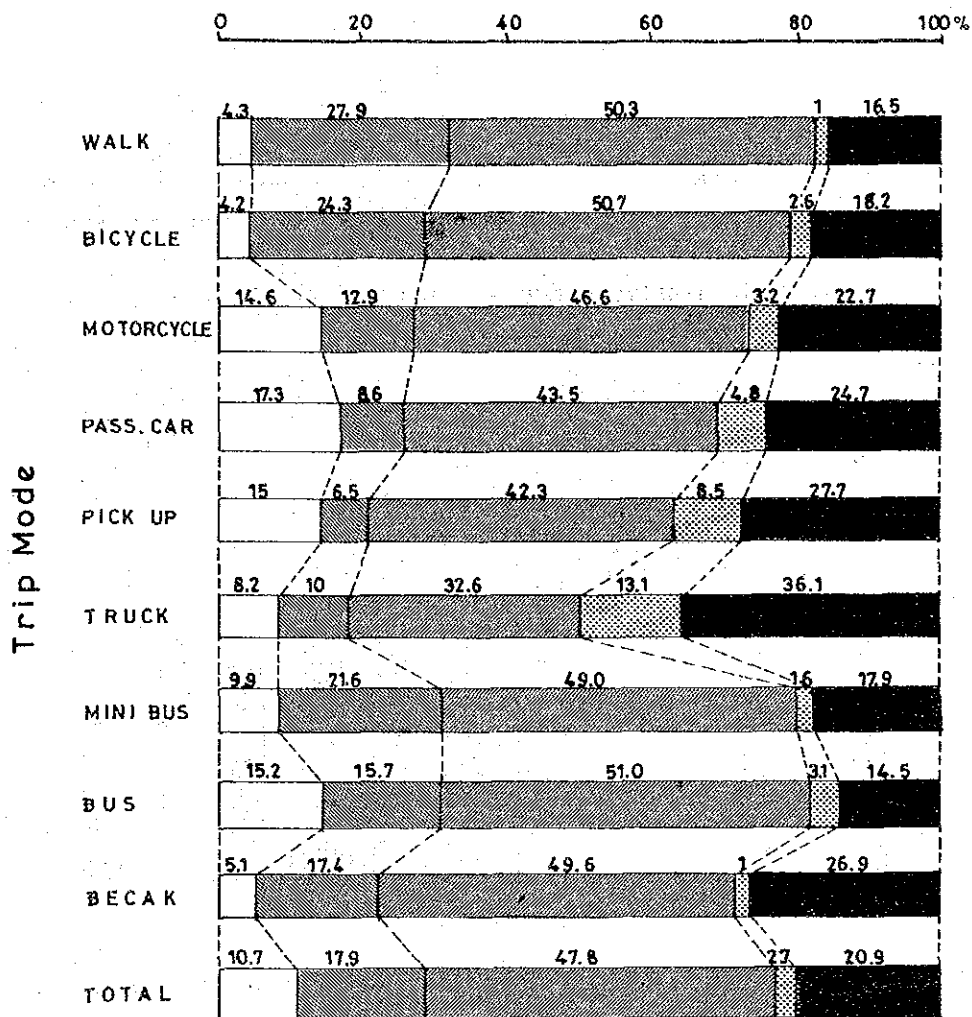
**Fig.**

**2.2.7**

**Modal Composition by Trip Purpose**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

### Trip Purpose in Percentage



- LEGEND :**
- WORK
  - SCHOOL
  - HOME
  - BUSINESS
  - PRIVATE

**UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY**

**Fig.**

**2.2.8**

**Composition of Trip Purpose by Mode**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

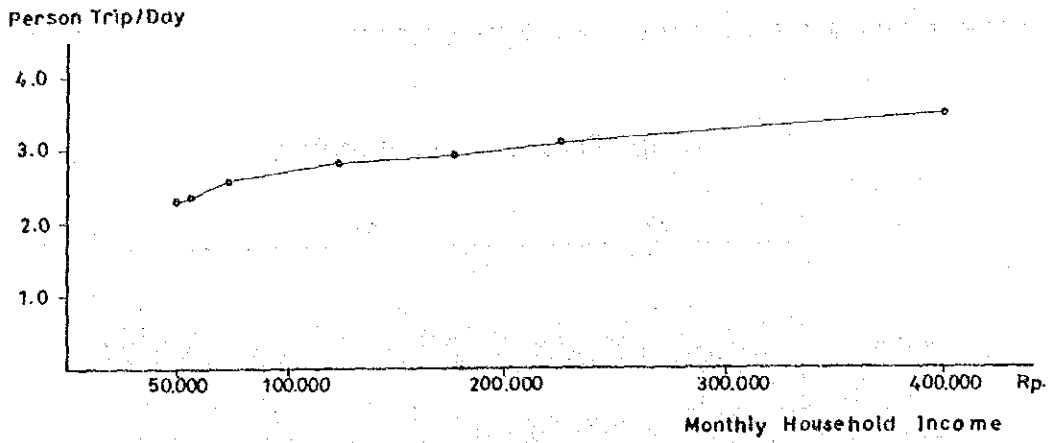


Fig. 2.2.9 Trip Production Rate by Household Income

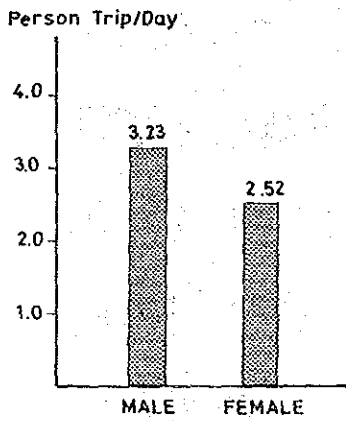


Fig. 2.2.10 Trip Production Rate by Sex

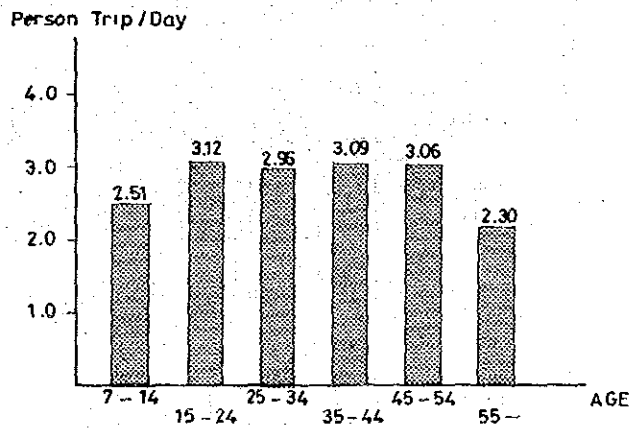


Fig. 2.2.11 Trip Production Rate by Age

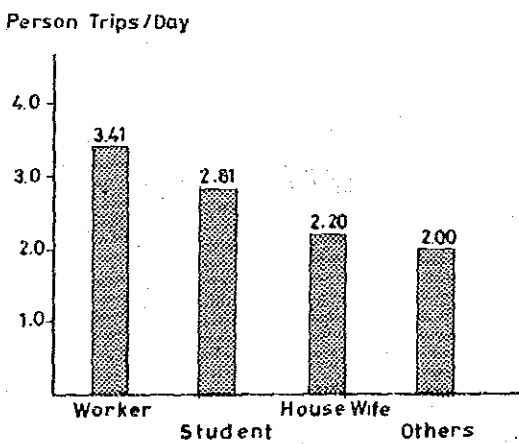


Fig. 2.2.12 Trip Production Rate by Status

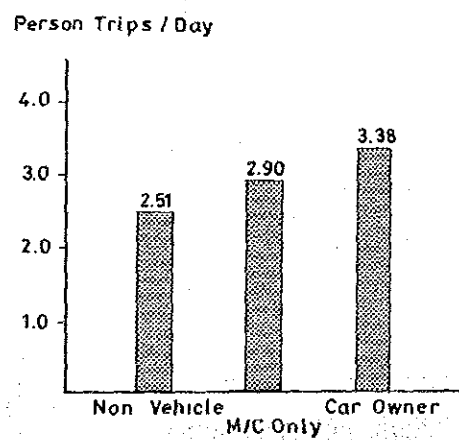
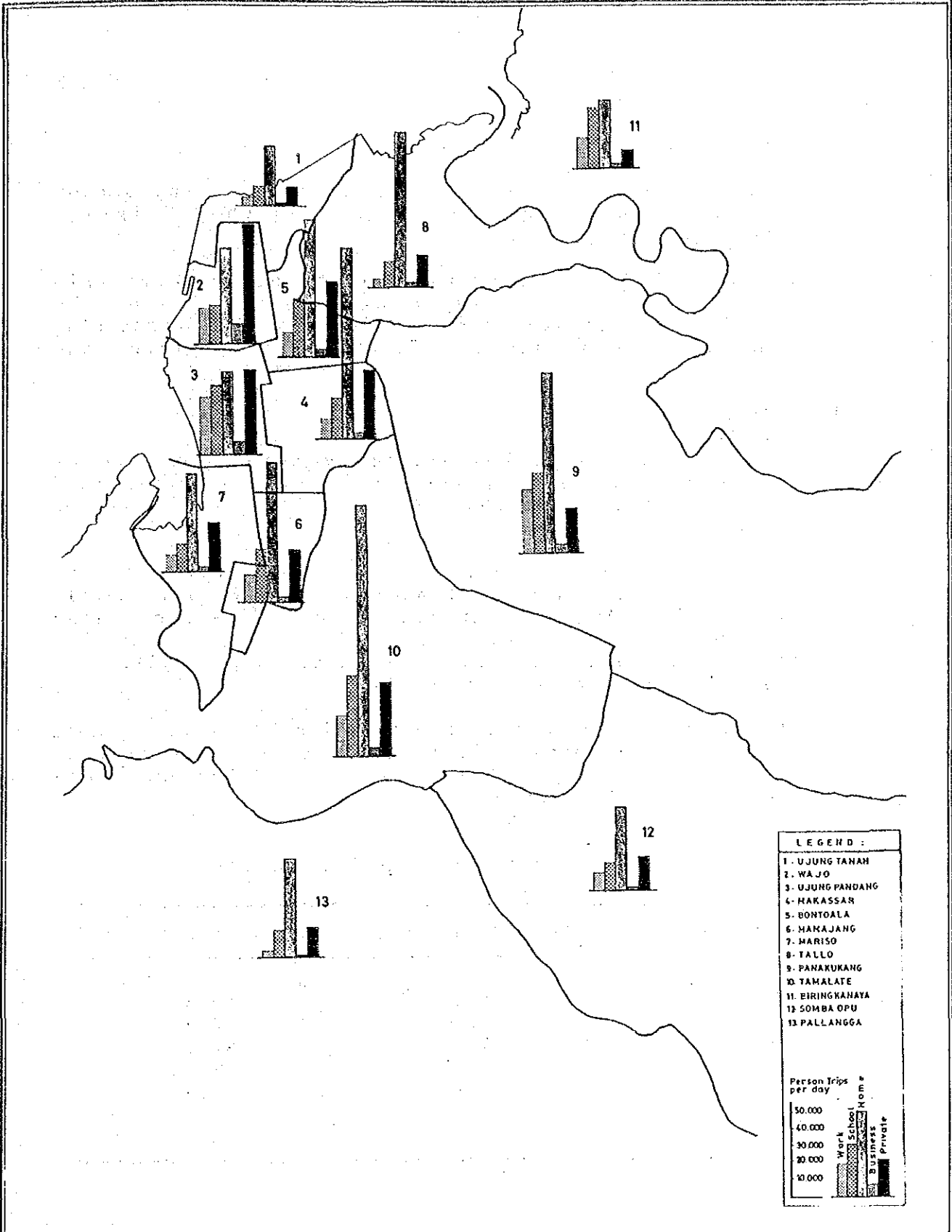


Fig. 2.2.13 Trip Production Rate by Vehicle Ownership



**UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY**

**Fig. 2.2.14** Trip Attraction by Purpose

**JAPAN INTERNATIONAL COOPERATION AGENCY**

g) Existing Origin-Destination Pattern

Fig. 2.2.15 shows the desire line of existing person trips, which has been derived from the Origin - Destination Table.

The existing pattern shows that there are large trip demands inside the central area as well as on the corridors between the central area and the surrounding urbanized zones, such as Panakukang, Tamalate, and Tallo.

h) Trip Length

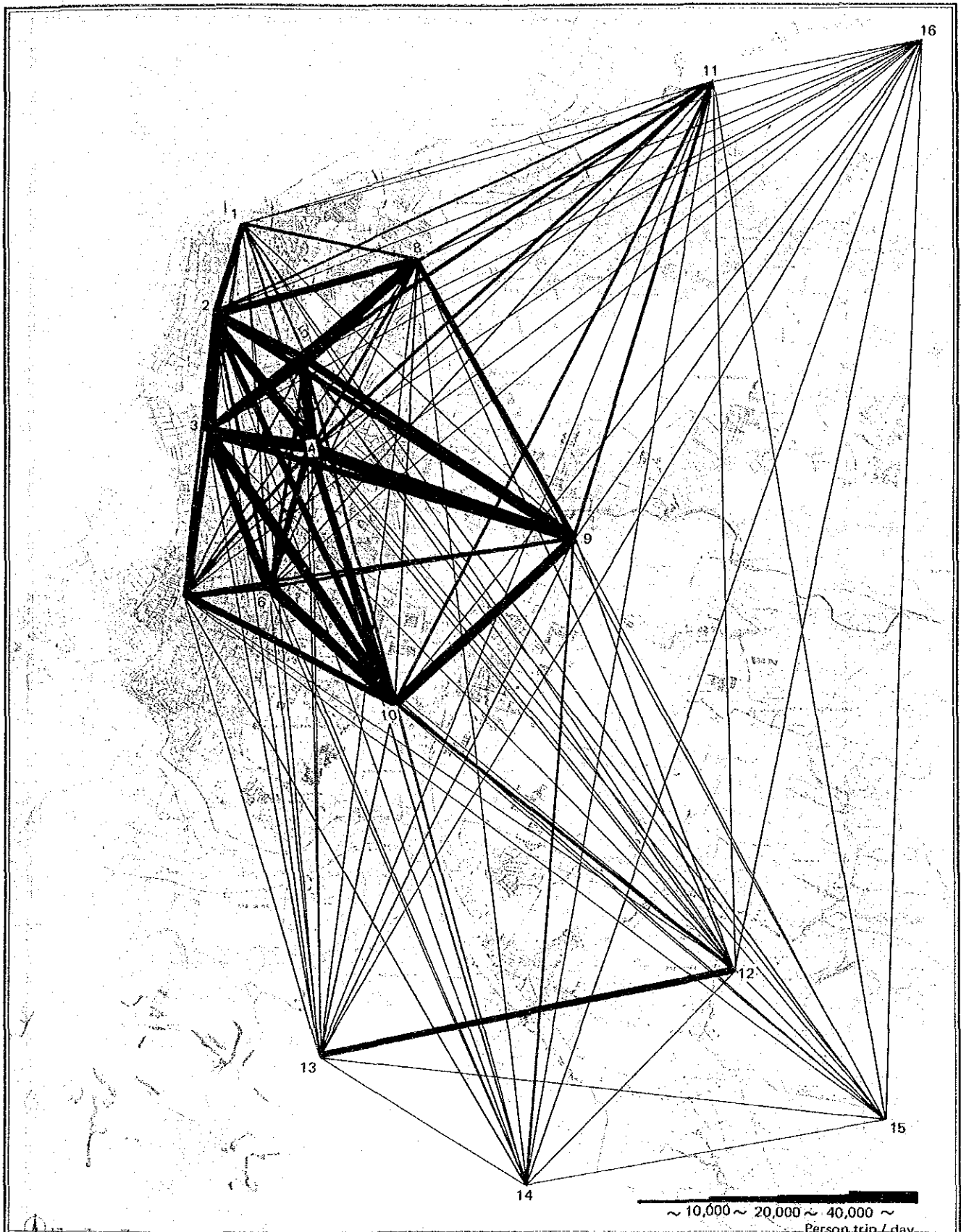
Trip length can be calculated by the simulation of inter-zonal person trip movement on the existing road network. Fig. 2.2.16 shows the trip length distribution by purpose.

In the cases of "Home", "School" and "Private", the distribution has a peak at about 1 to 2 Km and sharply drops till 7 Km, then gradually decreases converging onto zero. As for "Work" and "Business", the distribution is comparatively flat and decreases gradually corresponding to the distance.

The average trip length is obtained at 4.27 Km. Among the 5 trip purposes, "Business" has the largest trip length in average, i.e. 5.87 Km and "School" the shortest one, 3.76 km.

Table 2.2.5 Average Trip Length

Trip Purpose	Ave. Trip Length	Composition Rate
Work	5.41 km	10.8 %
School	3.76	17.9
Home	4.14	47.5
Business	5.87	2.9
Private	4.19	20.9
Total	4.27	100.0

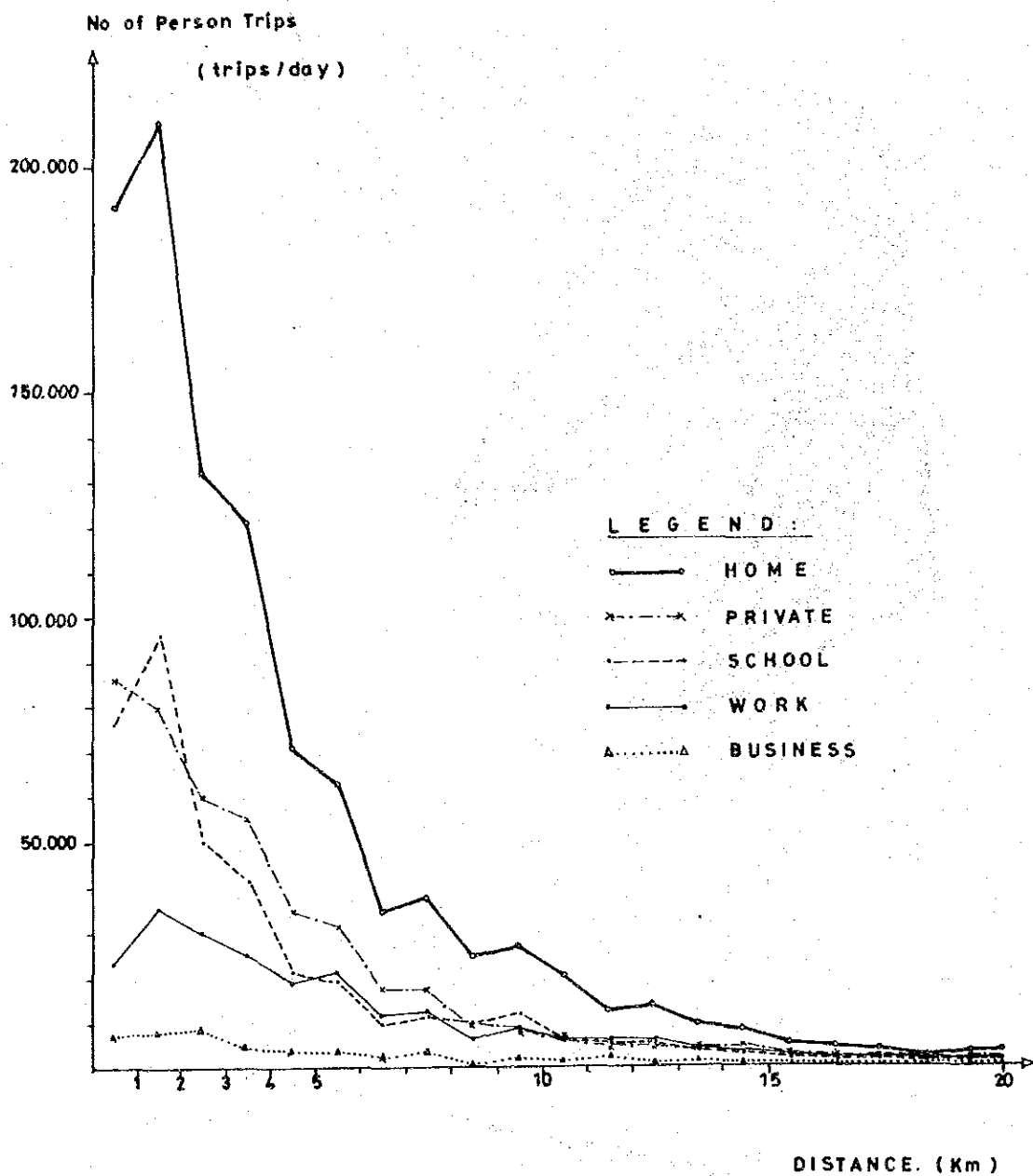


**UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY**

**Fig.**  
**2.2.15**

**Desire Line of Existing Person Trip**

**JAPAN INTERNATIONAL COOPERATION AGENCY**



**UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY**

**Fig.**

**2.2.16**

**Trip Length Distribution**

**JAPAN INTERNATIONAL COOPERATION AGENCY**



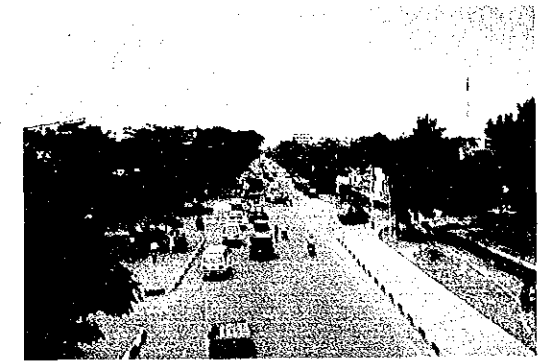
1 Jl. Gowa Jaya (Jl. Urip Sumoharjo)



2 Jl. A. Pettarani



3 Jl. Gowa Raya



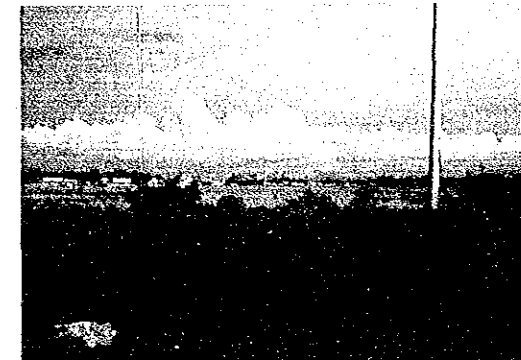
4 Jl. Sudirman



5 Intersection of Jl. Urip Sumoharjo/  
Jl. A. Pettarani



6 Sungguminasa



7 Antang Area



8 Daya Area



9 Intersection of Jl. Veteran/  
Jl. Gowa Raya/Jl. Raturangi



10 Becak



11 Urban Bus



12 Pete-Pete at Pasar Central Bus Terminal



13 Jl. Rappocini Raya



14 Panaikang Bus Terminal



15 Jl. Penghibur



16 Sunset in Losari Beach





## 2.3 Transport Facility Conditions

### 2.3.1 Existing Road Conditions

#### 1) Road Length

As shown in Table 2.3.1, the road length in Ujung Pandang, Gowa, Maros, and Takalar in 1986 is 788 km, 1,519 km, 200 km and 574 km respectively. In terms of the ratio of road length to the populated area, Ujung Pandang, Gowa and Takalar have relatively more developed road network, while roads in Maros are less developed.

Table 2.3.2 shows road length by class in Ujung Pandang and its surrounding area. The data were partly obtained from the Public Works Department and partly from result of measures by the Study Team based on the road classification done by the Public Works Department. The total length of arterial roads in the Study Area is estimated to be about 120 km.

Table-2.3.1 Road Length by Kabupaten/Municipality

Kabupaten Municipality	Road Length [A]		Populated [B]	A/B
	1981	1986	Area (ha)	
Ujung Pandang	788	788	4333	0.182
Gowa	1499	1519	9732	0.156
Maros	200	200	8034	0.025
Takalar	570	574	4549	0.126
Sulawesi Selatan	12428	15538	178576	0.087

Source: Sulawesi Selatan Dalam Angka 1986

Table-2.3.2 Road Length by Class

	Study Area		Total
	Ujung Pandang	Outside	
	(1)	Ujung Pandang (2)	
Arterial roads	88.6	31.2	119.8
Collector roads	131.8	69.7	201.5
Local roads	152.7	124.6	277.3
Other	414.9	NA	NA
Total	788.0	NA	NA

Source: (1) Kotamadya Ujung Pandang Dalam Angka 1986

(2) Study Team

## 2) Road Ratio

The Ujung Pandang area can be classified to three different areas namely urbanized area, sub-urbanized area and rural area taking into account the road network conditions.

The urbanized area covers the area vertically, separated from Jl. Rajawali to Jl. Veteran. The sub-urbanized area covers the area from Jl. Veteran to Jl. A.Pettarani and its extension, and rural area is an area other than the urbanized and sub-urbanized areas in Ujung Pandang. The road ratio of each area is shown in Table 2.3.3.

For reference, the road ratios of other cities are shown below:

- Medan (urbanized area)	: 8.0%
- Medan (all area)	: 2.1%
- Bangkok	: 10.0%
- Penang	: 21.8%

Table 2.3.3 Road Ratio

Area	Road Area (A) km <sup>2</sup>	Land Area (B) km <sup>2</sup>	Road Ratio (A/B) %
Urbanized area	1.79	12.125	14.8
Sub-urbanized area	0.8	16.125	5.2
Rural area	2.1	147.520	1.4
Total	4.81	175.770	2.7

## 3) Road Network

The arterial road network in the Study area basically shows an L-shape, vertically connecting Ujung Pandang with the major cities such as Maros and Sungguminasa. From Maros and Sungguminasa, there are branch roads stretching toward hilly area in the East, namely Pakalu in kabupaten. Maros and Malino in kabupaten. Gowa respectively.

The road network pattern in Ujung Pandang is a grid pattern in urbanized area of the city. However, it shows an irregular pattern in the newly developed area, where roads are not well developed and mostly discontinuous. Fig 2.3.1 shows the road network in Ujung Pandang and the surrounding area.

The arterial roads in north-south direction are Jl. Veteran and Jl. Dr. Ratulangi - Jl. Jenderal Sudirman and those in east-west direction are Jl. Gowa Jaya, Jl. Gowa Raya (St. Alauddin) and Jl. Jend.A.Yani. Between the built-up area of Ujung Pandang and the Hasanuddin airport, there are two (2) routes, Jl. Gowa Jaya (Urip Sumoharjo) and Jl. Tallo (Prof. Dr. Ir. Sutami) with a toll bridge over Sungai Tallo. Most of the existing roads are of single carriageway, except several arterial roads in Ujung Pandang.

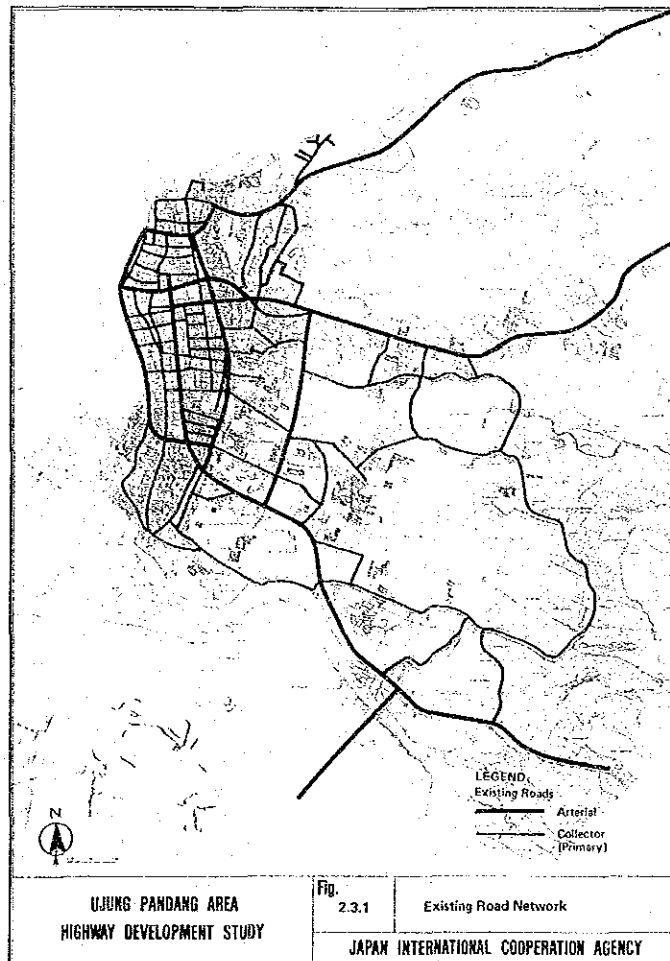


Figure 2.3.1 Existing Road Network

Fig. 2.3.1 Existing Road Network

### 2.3.2 Traffic Management Facility Conditions

#### 1) One-Way Roads

The one-way road system is introduced mainly to CBD and southern commercial area of Ujung Pandang. Arterial roads designated as one way road are Jl. Gowa Raya (St. Alauddin), Jl. Ratulangi, Jl. Jend. A. Yani, and Jl. G. Bulusaraung except the road section between Jl. Jend. Sudirman and Jl. G.Lompobattang. There are some periodic one-way roads having fixed time band which are Jl.Landak and a part of Jl. Ratulangi between Jl. Gowa Raya (St. Alauddin) and Jl. Landak, while all the other one-way roads are for 24 hours.

#### 2) Speed Limit

The speed limit on roads in the urban area of Ujung Pandang is regulated as 40 km per hour, while speed limit on roads in rural area and a toll road are regulated as 60 km per hour and 100 km per hour respectively. However, no traffic sign for speed limit is installed on these roads, except some roads in the rural area.

#### 3) No Entry for Truck and Becak

The arterial roads periodically prohibiting entry of trucks are as follows, and this regulation is observed by most of truck drivers.

- Jl. Gowa Jaya (Urip Sumoharjo) (6:00 - 10:00)
- Jl. Nusantara (6:00 - 20:00)

A large number of becaks, however, are seen to enter roads prohibited for entry of becaks. On the other hand, many parts of exclusive becak lanes are seldom used by becak due to poor pavement condition as well as existence of parking cars, and many becak drivers seem to prefer driving on arterial roads, which cause confusion to traffic flows on these roads.

#### 4) Traffic Signal

The total number of signalized intersections are twenty one (21) in the urban area. However, signals at only fourteen (14) intersections out of them are well functioning and the rest seem to be out of order. Operation of the traffic signals is normally suspended between 23:00 and 6:00 hours. On morning/evening peak hours, the traffic control at some signalized intersections is carried out by policemen without operation of traffic signal.

## 5) Safety Devices

Although street lightings are installed along the arterial roads and at the major intersections, brightness on the roads still seems to be insufficient. In addition, guard fences and guard rails are not installed in the urban area. Appropriate installation of guard fence/rail is effective to secure traffic safety.

## 6) Channelizing Facilities

Channelizing facilities such as traffic island, are not well installed at most of intersections. Effective installation of channelizing facilities will lead to smooth and safe traffic flow.

## 7) Traffic Accidents

The number of traffic accidents is highest in 1985 with 886 cases, while number of casualties is highest in 1987 with 1,017 persons. In addition, judging from this data, many traffic accidents are considered to be serious taking into account the numbers of death and serious injury per accident (0.64 person per accident in 1987). The more detailed traffic accident data are to be collected and analyzed to prepare a plan to improve intersections and others.

### 2.3.3 Pedestrian Facilities Conditions

#### 1) Sidewalk

Serviceable sidewalks are only installed along the part of Jl. Jend. Sudirman, Jl. Somba Opu, Jl. Kartini and Jl. Penghibur. These sidewalks are paved by concrete blocks and their surface conditions is almost good.

a) Jl. Jend. Sudirman	L = 320 m,	w = 3.3 m
b) Jl. Somba Opu	L = 620 m,	w = 2.4 - 3.2 m
c) Jl. Kartini	L = 320 m,	w = 2.0 - 3.0 m
d) Jl. Penghibur	L = 600 m,	w = 3.0 m

In addition, sidewalks partially installed only in front of shops are observed in some commercial areas. On the other road sections, even around bustling places like the central market, pedestrian have to walk either on the unpaved shoulder or carriageway, or on the exclusive becak lane on Jl. Veteran and Jl. Landak.

#### 2) Crosswalks and Pedestrian Overpasses

Even though crosswalks are installed at major intersections and on the busy roads, most of their markings have disappeared, just same as other pavement markings.

The standard width of crosswalks is 3 m. The bad condition of crosswalks might be one of the reasons to lead pedestrians to random crossing on roads.

Four (4) pedestrian overpasses are installed in the urban area of Ujung Pandang. The conditions of these pedestrian overpasses, however, are unsatisfactory for walking because the steel made stairs and floors have rusted and there are some holes. It seems that people are not using these pedestrian overpasses.

### 3) Signal Displays for Pedestrians

Traffic signal displays for pedestrians are installed at most of signalized intersections. However, none of them is functioning. So, pedestrians have to find intervals of the through and turning traffic flows to cross the roads.

## 2.3.4 Public Transport Facilities

There are three major bus terminals recognized by LLAJR and several sub-bus terminals and road-side terminals in the Study area. Among them, major terminals are off-road terminals with provision of facilities for urban buses and pete-petes/microlets, as well as for intercity buses and mini-buses. The major bus terminals are:

- a) Terminal Panaikang  
This terminal is located at about 5 km from the city center of Ujung Pandang along Jl. Urip Sumoharjo.
- b) Terminal Sungguminasa  
This terminal is located at the corner of the intersection of Ujung Pandang-Takalar Road and Jl. Sungguminasa in the center of Sungguminasa town.
- c) Terminal Maros  
This terminal is located along the Ujung Pandang - Pare-Pare Road about 1 Km south of Maros town.

Terminals for buses, mini-buses and pete-petes/microlets in the Study area have some of the following functions:

- a) To transfer passengers among urban buses and pete-petes/microlets.
- b) To transfer passengers between inter-city buses as well as mini-buses, urban buses and pete-petes/microlets.
- c) Turning points of buses and pete-petes/microlets.
- d) To collect fee by DIPENDA (Dinas Pendapatan Daerah-Tax Office) and to check bus, mini-bus and pete-pete/microlet operation by Police and LLAJR.

### 2.3.5 Parking Situation

#### 1) Parking Space

The authorized on-street parking spaces and distribution of major off-street parking spaces are located in CBD (surrounded by Jl. Bawakaraeng, Jl. Veteran, Jl. Martadinata and Jl. Satando) where have a high parking demand as this area is mainly a commercial area.

The area of on-street parking spaces in this area, excluding parking restricted zone, is estimated to be approximately 75.000 m<sup>2</sup> while the area of off-street parking spaces differs by the type of facility, between 60 m<sup>2</sup> and 500 m<sup>2</sup>, and total area is estimated to be about 7.300 m<sup>2</sup>.

#### 2) Occupancy of Parking Space

##### (1) On-Street Parking Space

In order to examine the occupancy of on-street parking spaces, "Parking Density" (parking demand/capacity of parking spaces) is calculated in the Study. The average parking density at the CBD is estimated to be about 60%.

Since most of on-street parking lots are not marked, some drivers park their vehicles irregularly, which cause disturbance to the main traffic flow.

##### (2) Off-Street Parking

Drivers who wish to visit major facilities usually utilize attached off-street parking spaces, and the capacity of existing off-street parking spaces seems to be sufficient. On the contrary, in case of small shops or small scale service facilities, they do not provide off-street parking spaces for drivers, hence, many drivers have to park their vehicles on the on-street parking spaces.

### 2.3.6 Other Transport Facilities Condition

#### 1) Hasanuddin Airport

##### (1) Location

The Hasanuddin Airport is located in the Kabupaten Maros, about 21 km north-east from the center of Ujung Pandang. Under the present condition, it is possible to facilitate DC-10 aircraft. However, A-300 is the biggest aircraft being used at present for the scheduled flights to/from this airport by PT. Garuda Indonesia.



## (2) Traffic Volume

As the result of the traffic volume counting survey, passenger cars occupy the highest composition rate of 36.8%, followed by Taxi/Mini Bus (26.8%), motorcycles (23.8%), and Pickups (8.0%). On the other hand, the peak hour for the vehicular traffic at airport is found to be between 11:00 a.m. and 12:00 a.m. with 499 vehicles for both directions.

In addition, it was mentioned by airport officials that about 80% of passengers and cargo handled at the Hasanuddin Airport were related to Ujung Pandang.

## 2) Makassar Port

### (1) Location

The Makassar port is located at the North-Western coast of the Ujung Pandang. The Makassar port is classified as one of the four gateway ports in Indonesia by the Directorate General of Sea Communications (DGSC) together with Belawan Port, Tanjung Priok Port of Jakarta and Tanjung Perak Port of Surabaya, and its coverage areas are Sulawesi, Maluku and Irian Jaya. The hinterland of the Makassar Port is considered to be central and southern part of Sulawesi Selatan.

### (2) Traffic Volume

As the results of the survey, about three-fourths of vehicles are related to the Soekarno Quay (284 vehicles) and the total number of vehicles are recorded as 387. In the case of vehicle composition, 177 of them are trucks (45.7%), followed by 105 of mini buses/pickups (27.1%) and 66 of motorcycles (17.1%).

## 2.4 Public Transportation Conditions

### 2.4.1 General

There are five types of public transport modes in the Study area. They are:

- (1) Urban bus
- (2) Pete-pete and microlet
- (3) Intercity bus and mini-bus
- (4) Taxi
- (5) Becak

Urban bus, pete-pete\* and microlet\*\* operate routes in the urban and the sub-urban areas of Ujung Pandang (these systems are called as 'Angkutan Kota'). Intercity bus and mini-bus (including some pete-pete/microlet) are predominantly used for intercity services (these systems are called as 'Ang Antar Kota'). Taxi is limited to only a specific use mainly from the Hasanuddin Airport to each destination. While becak, which is a traditional public transport mode, still has an important role as feeder service particularly for short haul of door-to-door service, even though its relative importance has been decreasing. In addition, horse cart is still operating in Maros.

In order to clarify the present public transport conditions, various data and information were collected from Municipality and LLAJR (Kantor Wilayah Lalu Lintas dan Angkutan Jalan Raya) as well as bus and taxi companies, and analyzed. The results are summarized in the succeeding sections.

### 2.4.2 Urban Public Transport System

#### 1) Urban Bus Service

In the Study area, especially in Ujung Pandang, a government enterprise DAMRI (Djawatan Angkutan Motor Republik Indonesia) operates urban bus services. By the beginning of April 1988, however, urban bus routes were limited only for 3 routes and bus fleet used for these routes were only 20 double-decker buses with capacity of 86 passengers. Therefore, urban bus service in that time was only functioning to supplement pete-pete/microlet services mentioned in the following section.

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Note \* : Pete-pete is a special term only used in the South Sulawesi calling for a modified light truck utilized for passenger transport. In other areas, same vehicle is usually called as Bemo.

\*\* : Microlet is a light van utilized for passenger transport, widely used in urban areas of Indonesia. Even though, microlet is classified as different category by LLAJR, general public of Ujung Pandang also call microlet as pete-pete.

However, since 5th of April, 1988, DAMRI introduced 20 new ordinary bus fleet with capacity of 50 passengers, followed by additional 5 new ordinary buses from the middle of July, 1988. At the same time, LLAJR provided a permit for DAMRI to operate additional 3 routes. Hence, present urban bus routes become 6 routes (2 routes operated by double-decker buses and other 4 routes by ordinary buses -- see Fig. 2.4.1). Actually, LLAJR provided permit for new routes which were not competitive with the existing pete-pete/microlet routes. Details of urban bus routes are shown in Table 2.2.1. Those urban bus routes mainly cover arterial roads.

Table 2.4.2 shows the yearly (1983-1987) and monthly (1988 Jan.-Jun.) fluctuation of number of DAMRI bus passengers. It is clear that number of passengers have increased about 60% after starting operation of new routes.

In case of urban bus services, every bus is only allowed to load/unload passengers at bus stops, where bus stop signs are installed. According to an official of DAMRI, every driver of urban bus follows time schedule of operation and it is possible to secure the punctuality of operation at present.

Operation hour of urban buses are usually between 6:00 and 20:00. The urban bus fare is fixed at Rp. 150 for ordinary passengers, while special discount fare of Rp. 75 is available for students.

**Table 2.4.1 Details of Urban Bus Operation**

Route No.	Route	Distance (km)	Type of Bus	No. of Bus	Frequency (min./bus)
1	Daya - UNHAS - Pa'baeng-baeng Via. Jl.U.Sumoharjo, Sentral,	18	Double-Decker	9	15
2	Sentral - Sungguminasa Via. Jl.Bulisaraung, Jl.U.Sumoharjo	14	Double-Decker	10	12
3	Mandai - Pasar Panampu Via. Jembatan Toll, Jl.Ir.Sutami	18	Ordinary Bus	4	25
4	Pasar Panampu - Sungguminasa Via. Jl.Yos Sudarso, Jl.Veteran	16	Ordinary Bus	6	23
5	Pelabuhan Hatta - Sungguminasa Via. Jl.Andalas, Jl.Cendrasasih Jl.R.Daeng Tata	17	Ordinary Bus	6	22
6	Perumnas Panakukang - Pelabuhan Hatta Via. Jl.Hertasning, Jl.Landak Baru Pa'baeng-baeng, Jl.Penghibur, Sentral, Jl.Nugantara	16	Ordinary Bus	8	13
T O T A L		99		43	

Source : Kanto DAMRI, Ujung Pandang

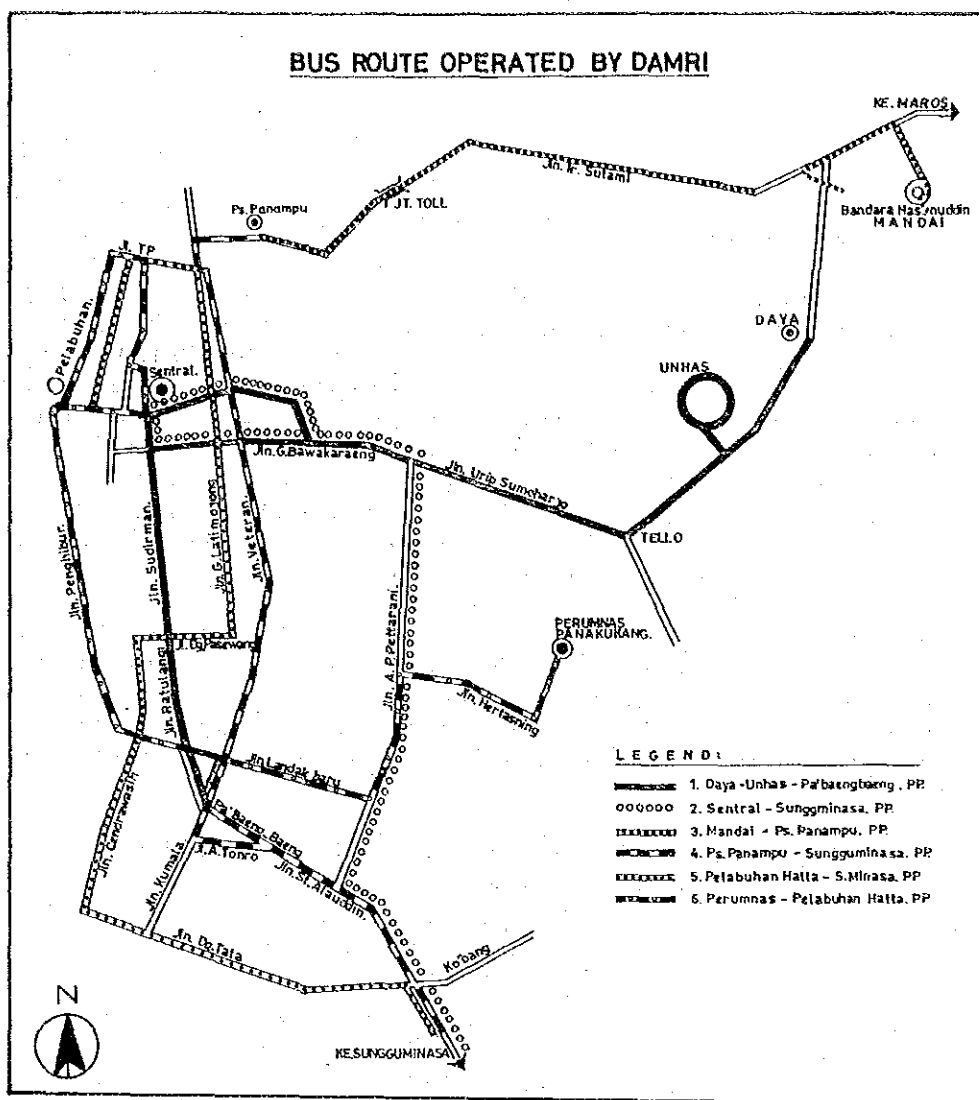


Fig. 2.4.1 Urban Bus Routes Operated by DAMRI

Table 2.4.2 Number of Bus Passengers

Year	No. of Passengers	Growth Rate	Remark
1983	1,547,312		
1984	2,837,229	83.4%	
1985	3,165,548	11.6%	
1986	3,173,354	0.2%	
1987	3,089,935	-2.6%	Fare hike
1988			
Jan	225,038		
Feb	228,727		
Mar	277,286		
Apr	311,864		Open new routes
May	443,880		
Jun	412,018	59.7%*	

Source: DAMRI

Note \*: Comparison between the number of passengers in the first and the second quarters of year 1988. New 3 routes start operation since 5th April.

## 2) Pete-pete/Microlet Service

In the Study Area, pete-pete/microlet with the capacity of about 8-10 passengers are operating as the main public transport mode. According to the statistics of LLAJR, the total number of pete-petes/microlets registered are 2,825 in 1988, which are twice as much as compared with 1983, as shown in Table 2.4.3. Since there is a LLAJR policy to convert pete-petes to microlets, it was mentioned by a LLAJR official that number of pete-petes has decreased, while number of microlets has rapidly increased within these few years.

Pete-petes/microlets are operated by numerous private companies including one big company and individual operators. Hence, according to LLAJR, it is rather difficult to control pete-pete/microlet operators, even though there is an association of pete-pete/microlet operators.

Table 2.4.3 Number of Pete-pete/Microlet

Year	No. of Pete-pete/Microlet	Annual Growth Rate
1983	1,416	
1984	1,443	1.9%
1985	2,565	77.8%
1986	n.a.	
1987	2,794	
1988	2,846	1.9%

Source : LLAJR

The total number of pete-pete/microlet routes approved by the Municipality is 22 at present, as shown in Table 2.4.4. Distance of routes are ranging from 5km to 25km, while fares also varies from Rp. 150 to Rp. 425 according to each route. Other than these 22 routes, special permit is issued to 194 pete-petes/microlets for operation of Sentral - UNHAS route only in the peak hours, beside their original permission.

It is clear from this table that number of operating pete-petes/microlets are considerably different by route. At present, about 60% of pete-petes/microlets (1,670 in number) are concentrated into only 4 routes to/from Sentral (Sungguminasa route, Cenderawasih route, Daya route and IKIP/Perumnas route), while there are 3 routes without actual operation of pete-petes/microlets.

It should be noted that many pete-petes/microlets are not exactly follow the permitted routing, especially near the turning point, in order to load extra passengers or to unload passengers, even though these operations are illegal.

**Table 2.4.4 Details of Pete-pete/Microlet Operation**

Route No.	Route	Distance (km)	Pete-pete /Microlet		Tarif (Rp.)
			No.	Ratio	
1	Sentral - Term. Sungguminasa	11	536	19.0%	250
2	Sentral - Jl. Cenderawasih	7	315	11.2%	150
3	Sentral - Tallo	7	175	6.2%	150
4	Sentral - Daya	12	380	13.5%	250
5	Term. Panaikang - Perumnas	5	20	0.7%	250
6	Sentral - IKIP - Perumnas	8	439	15.5%	250
7	Term. Panajangk - Maros	25	90	3.2%	425
8	Sentral - Jongaya	7	197	7.0%	150
9	Term. Panaikang - Jl. Cenderawasih	7	35	1.2%	300
10	Term. Panaikang - Jl. Nuri	8	0	0.0%	300
11	Term. Panaikang - Jl. Kalimantan	5	0	0.0%	300
12	Term. Panaikang - Jongaya	7	10	0.4%	300
13	Term. Panaikang - Jl. Sung	5	5	0.2%	300
14	Term. Panaikang - Paser Cidu	5	0	0.0%	250
15	Term. Panaikang - Ujung Pandang Baru	11	47	1.7%	250
16	Sentral - Toll - Daya - Mandai	12	189	6.7%	250
17	Sentral - Tello - Antang	11	133	4.7%	250
18	Sentral - Tello - STIKI - Perumnas	8	100	3.5%	175
19	Sentral - Pa'baeng - Perumnas	8	114	4.0%	175
20	Term. Panaikang - Term. Sungguminasa	11	20	0.7%	300
21	Pasar Panampu - Parang Tambung	11	5	0.2%	250
22	Jl. Cenderawasih - Mangusa	10	15	0.5%	150
<b>TOTAL</b>			<b>201</b>	<b>2,825</b>	<b>100.0%</b>

Source : Daftar Jumlah Armada Angkutan Kota, LLAJR Ujung Pandang, 23/6/88

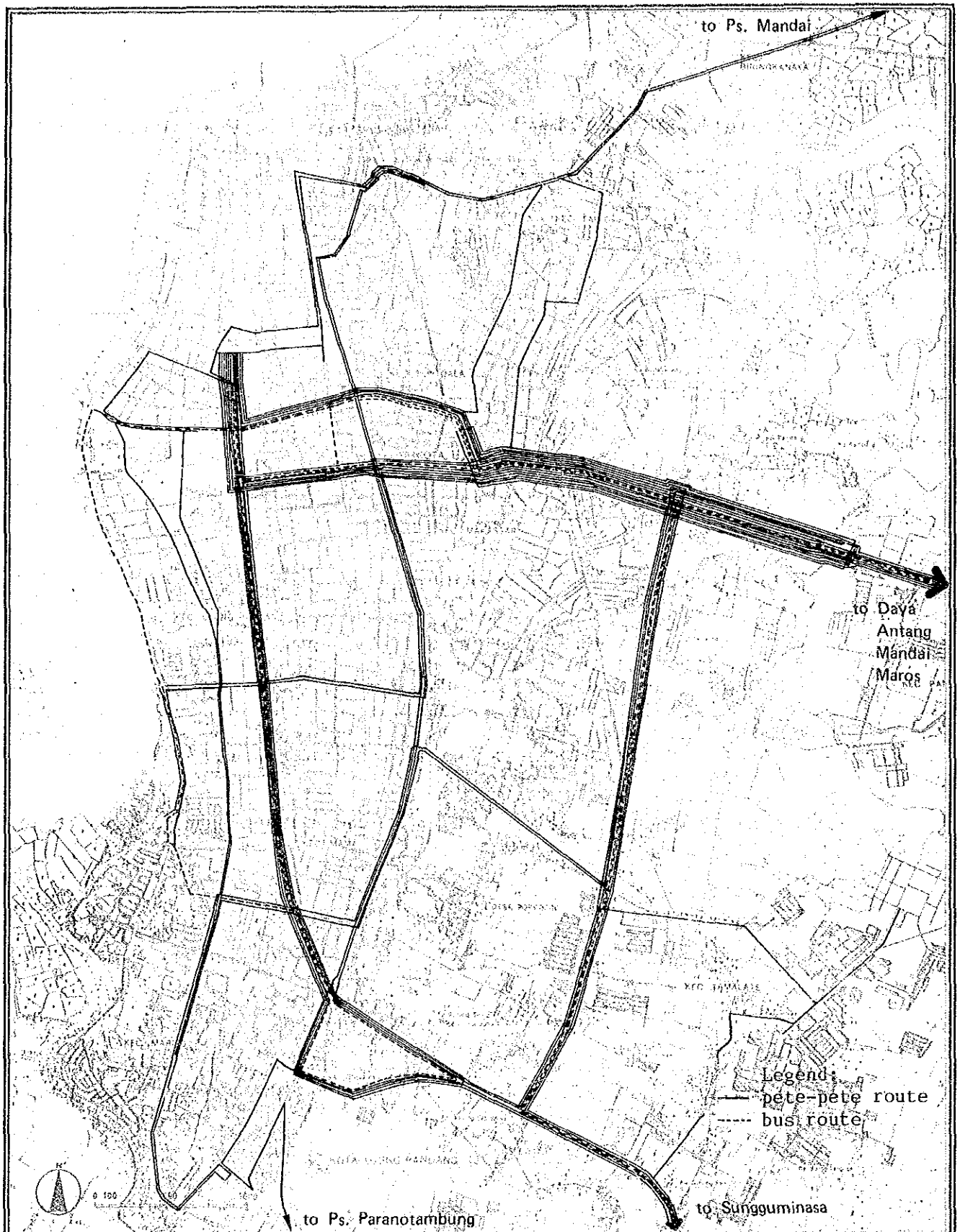
As shown in Fig 2.4.2, pete-petes/microlets mainly operate on arterial roads as well as primary local roads, covering the densely populated area of the Study area. It can be observed from this figure that many pete-pete/microlet routes are gathered on certain arterial roads, such as Jl.Urip Sumoharjo, Jl.Pettarani, Jl.Ratulangi, Jl.Bulusarang, Jl.Mesjid Raya, Jl.Sudirman, Jl. Ratulangi and Jl. Gowa Raya (St. Alauddin). Along these roads, vehicle composition of pete-petes/microlets is relatively high.

Although the pete-pete/microlet routes are fixed, they are allowed to stop any places if drivers/passengers prefer to stop, except road sections with prohibition of stopping, especially near intersections. In fact, these stopping of pete-petes/microlets are one of the causes of traffic congestion, especially in the central part of Ujung Pandang.

The operating hour is usually from 5:00 to 22:30. The service frequency varies depending on drivers, since some pete-petes/microlets drivers stop their vehicles at terminals until certain number of passengers are secured. However, frequency of pete-pete/microlet on trunk routes are considerably high.

### 2.4.3 Intercity Bus Service

Intercity bus services related to the Study area are basically operated by ordinary bus fleet (more than 20 passenger seats) for long range routes and mini-bus fleet (10 - 19 passenger seats) for short range routes, together with limited number of pete-petes/microlets and taxis. Many bus company registered in Ujung Pandang as



**UJUNG PANDANG AREA  
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**Fig.  
2.4.2**

**Urban Bus Route**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

well as in other cities of South Sulawesi operate inter-city buses. At present, 57 companies registered in Ujung Pandang and other 57 companies registered in other cities operate intercity buses to/from Ujung Pandang. Table 2.4.5 shows major intercity bus companies registered in Ujung Pandang.

In 1988, the total number of buses and mini-buses registered in Ujung Pandang in 1987 is 648, while 204 of them are owned by 35 small companies with less than 10 buses fleet in each company. While number of ordinary buses and mini-bus operate intercity buses routes are 224 and 986 respectively, including those registered in other area than Ujung Pandang.

There are 18 bus routes originating from Ujung Pandang, 13 of which are the ones toward the north direction via Maros, the rest are toward the south via Sungguminasa. The intercity bus routes are shown in Fig 2.4.3. According to the LLAJR data, operational frequency of intercity buses and mini-buses is 975 round trips per day in average.

At present, intercity buses and mini-buses to/from the north and the east directions via Maros exclusively utilize the Terminal Panaikang, while those to/from the south and the east directions via Sungguminasa load/unload passengers at several places, such as Pasar Sentral sub-terminal, Pa'baeng-baeng sub-terminal and along Jl.Veteran.

**Table 2.4.5 Name & Fleets of Intercity Bus Company Registered in Ujung Pandang**

Name of Bus Company	No. of Bus	No. of Mini-Bus	Total
Taspi Trd Coy. Ot.	46	-	46
Liman Ekspres	35	5	40
Litha Fa	19	20	39
Surya CV	-	39	39
Satria CV	-	25	25
Hiburan CV	-	24	24
Lando Indah CV	-	20	20
Haji Kalla HV	17	1	18
Setia Jaya CV	6	12	18
Edy Jaya CV	2	16	18
Rahmat Po	1	15	16
Kalampang CV	-	16	16
Mula Pertama	4	11	15
San Jaya CV	3	12	15
Gamri PK	1	13	14
Bunga Mawar CV	-	14	14
Air Mas Jaya CV	-	14	14
Setiawan UD	-	13	13
Alam Indah CV	10	-	10
PT. H. Beddu Solo	10	-	10
Mata Allo	-	10	10
Ichtiar CV	-	10	10
Other Companies	31	173	204
<b>T O T A L</b>	<b>185</b>	<b>463</b>	<b>648</b>

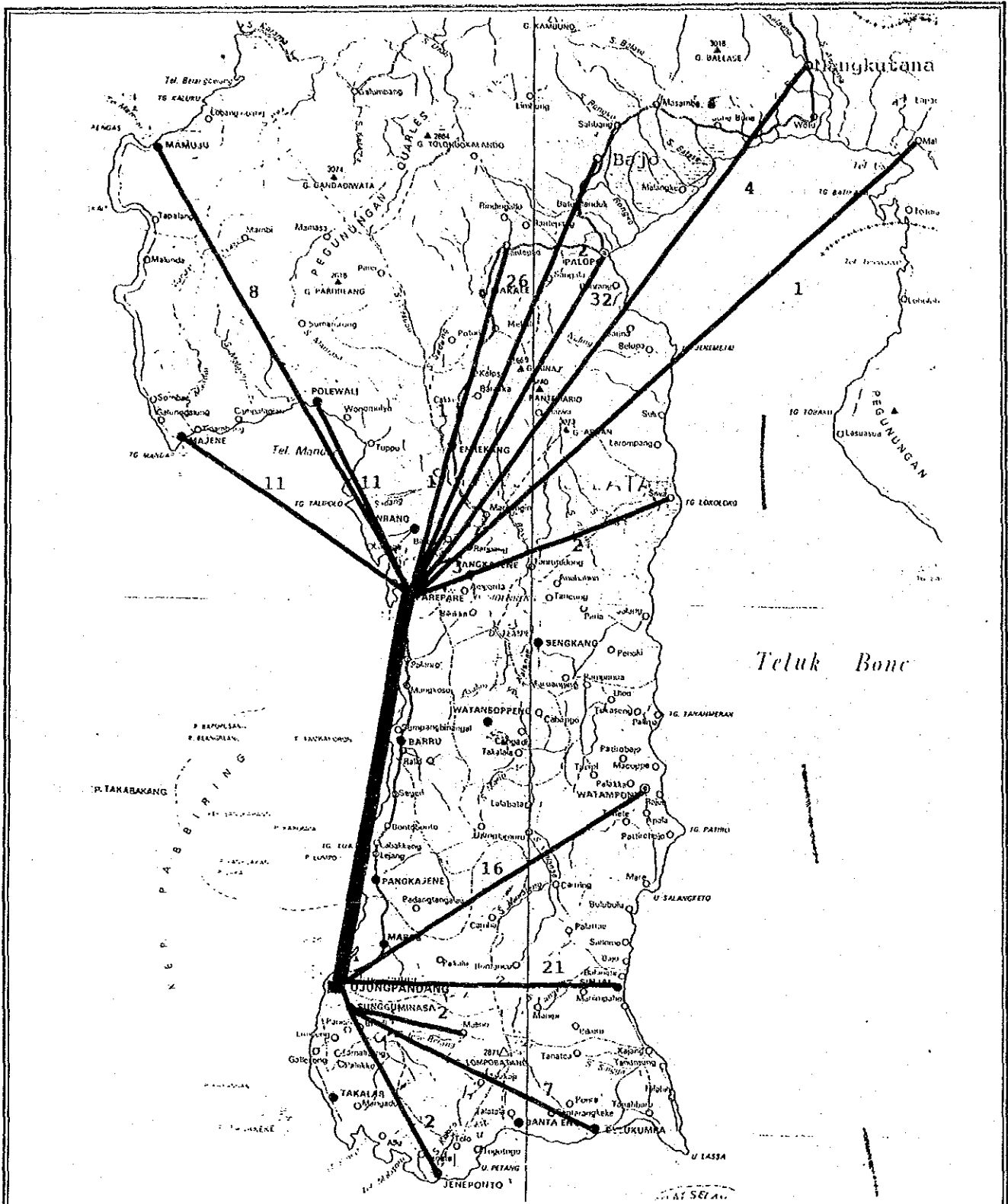
Source : Daftar Oto Bis Umum Sulawesi Selatan 1987/1988  
 Kanwil XIII GHLC South Sulawesi.

Note: \* : Bus; more than 20 passengers

\*\* : Mini-bus; 10-19 passengers

\*\*\* : Other companies includes 35 companies





Note : the number indicates the daily frequency of bus services from Ujun Pandang



**UJUNG PANDANG AREA  
HIGHWAY DEVELOPMENT STUDY**

Fig. 2.4.3

Intercity Bus Routes

**JAPAN INTERNATIONAL COOPERATION AGENCY**

#### 2.4.4 Other Public Transport Services

##### 1) Taxi

Taxi service is available for the transport from the Hasanuddin Airport and on charter bases in Ujung Pandang. About 80 taxis are owned and operated as airport taxies by a company and a cooperative. In addition, about 70 individually owned cars including private vehicles are operated as taxies in Ujung Pandang.

##### 2) Becak

As a supplementary public transport mode, becak is still widely used by the residents in the Study area, particularly in the area where urban bus and pete-pete/microlet service is not well provided. And also, under the hot climate as well as the heavy rain fall, door-to-door service by becak is considered to be still useful for the general public.

The total number of becaks registered in Ujung Pandang between 1982 and 1987 are shown in Table 2.4.6. In 1985, an order was issued to decrease total number of becaks, hence the number of becaks had decreased drastically. Since then, number of becaks registered has kept a stable level at around 12,000. However, according to officials, many becaks rejected registration have still been operating illegally and it is said that the number of those illegal becaks is between 2,000 and 3,000.

However, the importance of becaks is decreasing in the framework of urban transport. In fact, becak driver job is getting less attraction in terms of wage, since it has become less competitive to urban bus or petepetes/microlets along with the development of public transport system.

Table 2.4.6 Number of Registered Becak

Year	No. of Becak
1982	14,674
1983	14,152
1984	14,086
1985	11,839
1986	12,032
1987	12,000

Source : DIPENDA and Non Motorized Vehicle Testing Section, Katamadya Ujung Pandang

### 2.4.5 Characteristics of Passengers of Public Transport Modes

In order to identify characteristics of passengers of public transport modes, analyses are carried out on data obtained from both the person trip survey and the additional becak survey, which was conducted in July. The followings are the findings from these analyses.

#### 1) Household Income

There are not so much difference in household income of passengers of each transport mode. Fig. 2.4.4 illustrates the composition of passengers of every public transport mode according to the household income level. About 21% of passengers belong to houses with income level of Rp. 100,000-150,000, followed by Rp. 150,000-200,000 level (18.4%). In considering the average household income of about Rp. 168,000 in the Study area, there is a tendency that rather lower income level people use public transport system more often than higher income level people.

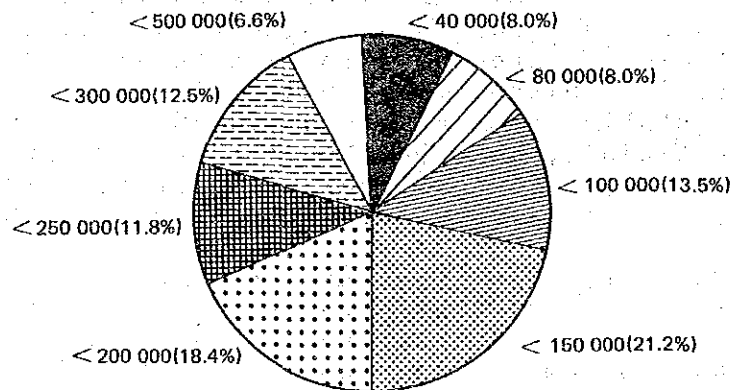


Fig. 2.4.4 Household Income of Passengers

#### 2) Sex of Passengers

Fig. 2.4.5 illustrates the comparison of sex of passengers of each transport mode. There are considerable differences of sex of passengers of each transport mode. In a case of bus passengers, about one-third of them are male, while female passengers are slightly more than male passengers of pete-petes/microlets. On the contrary, more than three quarters of becak passengers are female.

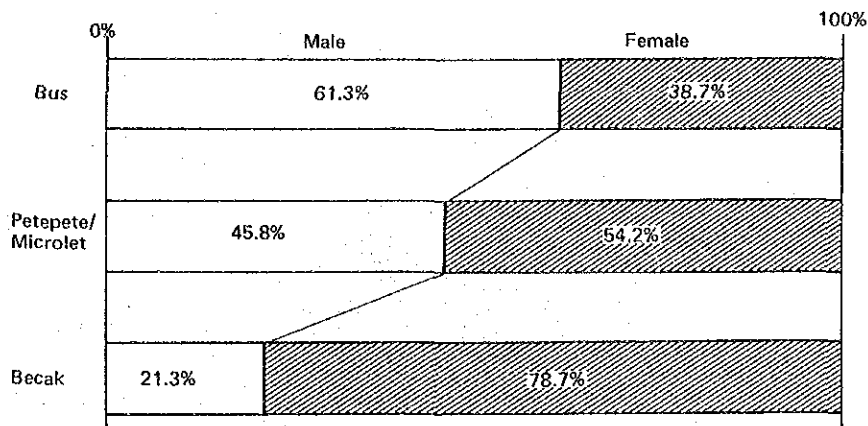


Fig. 2.4.5 Sex of Passengers by Transport Mode

### 3) Occupation/Status of Passengers

Figure 2.4.6 illustrates the comparison of occupation/status of passengers of each transport mode. In general, about one-third of passengers of each mode are students. However, government officials occupy a high composition (26.5%) in the case of bus passengers, while house wives occupy the highest composition (32.8%) in the case of becak passengers.

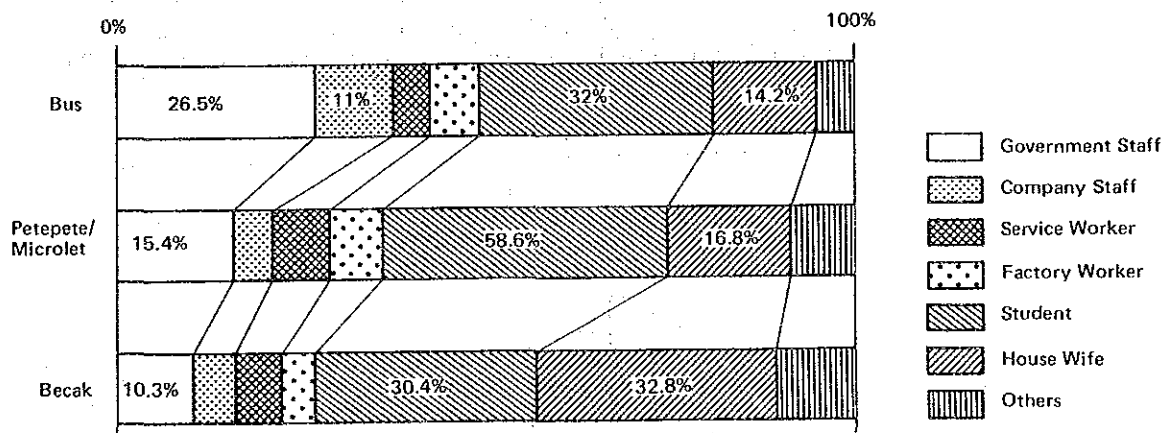


Fig. 2.4.6 Occupation / Status of Passengers

### 4) Trip Purpose

As same as the household income, there are not so much difference in trip purposes of passengers of each transport mode. Figure 2.4.7 illustrates the composition of trip purposes of passengers of every public transport mode. It is clear from this figure that "To home" purpose occupies about a half, followed by "Private matter" (21.3%) and "To school" (16.9%) and "To work" (11.0%).

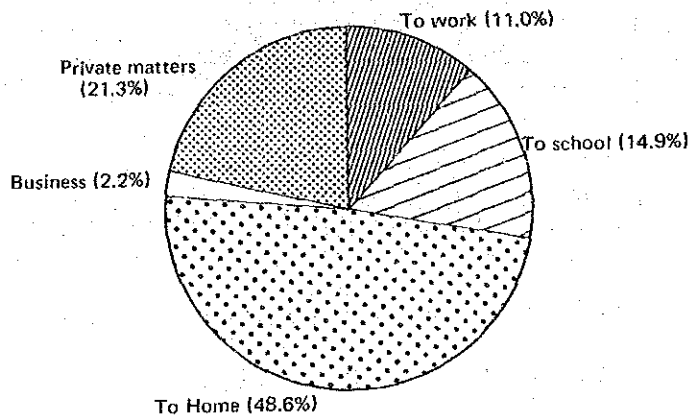


Fig. 2.4.7 Trip Purpose of Passengers

5) Travel Distance of Becak Passengers

Fig. 2.4.8 illustrates the variety of travel distance of becak passengers. Travel distances vary from 400m in minimum and 7.2km in maximum, and the highest composition is travel distance of 1.5 - 2.0km (21.7%), while an average travel distance is calculated as 1.97km.

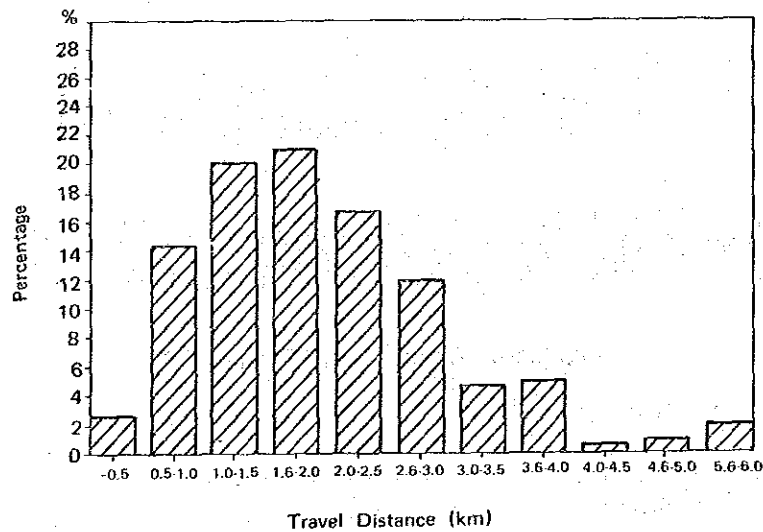


Fig. 2.4.8 Travel Distance of Becak Passengers