URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION MALAYSIA

TECHNICAL REPORT 7
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GENERAL

1.0 PUBLIC TRANSPORT : AN OVERVIEW

1.1 Scope of Study

This volume describes public transport services provided by the following modes of transport.

scheduled bus - within Johor Bahru, in the Study Area and to Singapore

Express bus - in the Study Area, to other parts of Peninsular Malaysia and to Singapore.

School and Factory Buses

Taxis - in Johor Bahru and in Study Area

Rail services - inter-regional

Air services - inter-regional

The concern with these modes is from the viewpoint of passenger flows. Commercial and freight services are dealt in another volume.

The detailed contents examined in each mode is shown in Table 1-1.

1.2 Institutional Organization for Public Transport

1.2.1 Road Transport

There are two government departments directly concerned with road public transport.

The Public Transport Licensing Board supervises the following:

- issue of operating licence and routes to public transport modes
- administration of fare system

The Registrar and Inspectorate of Motor Vehicles deals with the registration and inspection of all motor vehicles, including public transport vehicles, specifically

- registration and licensing of vehicles

Table 1.1. : Scope of Study

	Scheduled Bus (Urban and Intra-Regional)	School Bus/ Factory Bus (Urban)	Taxi	Express Bus (Intra-regional)	Express Bus (Inter-(regional)	Scheduled Bus (Singapore 1)	Rail Services (Inter-(regional)	Air Services (Inter-(regional)
CHARACTERISTICS								
Finance	x			x	x			
Fleet	x	x	x	x	x			
Employment	x			x	x			
TRAVEL DEMAND								
Annual Growth	x			x	x		x	x
Monthly	x					x		
Daily	x					x		
Hourly	x					x		
SERVICE LEVEL								
Route Network	x			x	x	x	x	x
Frequency	x			x	x	x	x	x
Bus-stop Cover-age	x					x		
Travel Time	x		x	x	x	x	x	x
Passenger Load	x		x	x	x	x	x	x
UNIT REVENUE & COSTS	x			x	x			
USER CHARACTER-ISTICS TRIP PURPOSE	x			x	x	x	x	x
USER OPINIONS	x		x	x	x		x	x

- inspection to ascertain the roadworthiness of public transport vehicles
- collection of registration fees and road tax
- testing and licensing drivers of all motor vehicles
- enforcement of road traffic ordinances

The planning of Federal Roads is undertaken by the Highway Planning Unit of the Department of Public Works in the Ministry of Works and Utilities.

The planning of Federal Roads and Toll Express Ways to be planned, designed and managed (collection of toll) by joint-venture or private contractors is undertaken by the Highway Development Authority. The principal project of this body is the Perlis to Johor Bahru Toll Expressway.

The Economic Planning Unit in the Prime Minister's Department acts as a coordinating and policy making body. It sets the policies which are administered by the Public Transport Licensing Board and RIMV.

The practice of fare fixing is a compromise between bus companies which propose a new fare on the arguement that operating costs have increased while the Public Transport Licensing Board investigates and issues a final fare system. The last fare increases for scheduled buses were in 1980 and 1978.

1.2.2 Rail and Air

Railway services are operated by Keretapi Tanah Melayu (Malayan Railways) which is under the Ministry of Transport . The Department of Civil Aviation controls air services in the country. Passenger air services are operated by Malaysian Airline System. There are small, charter services which are of minor importance.

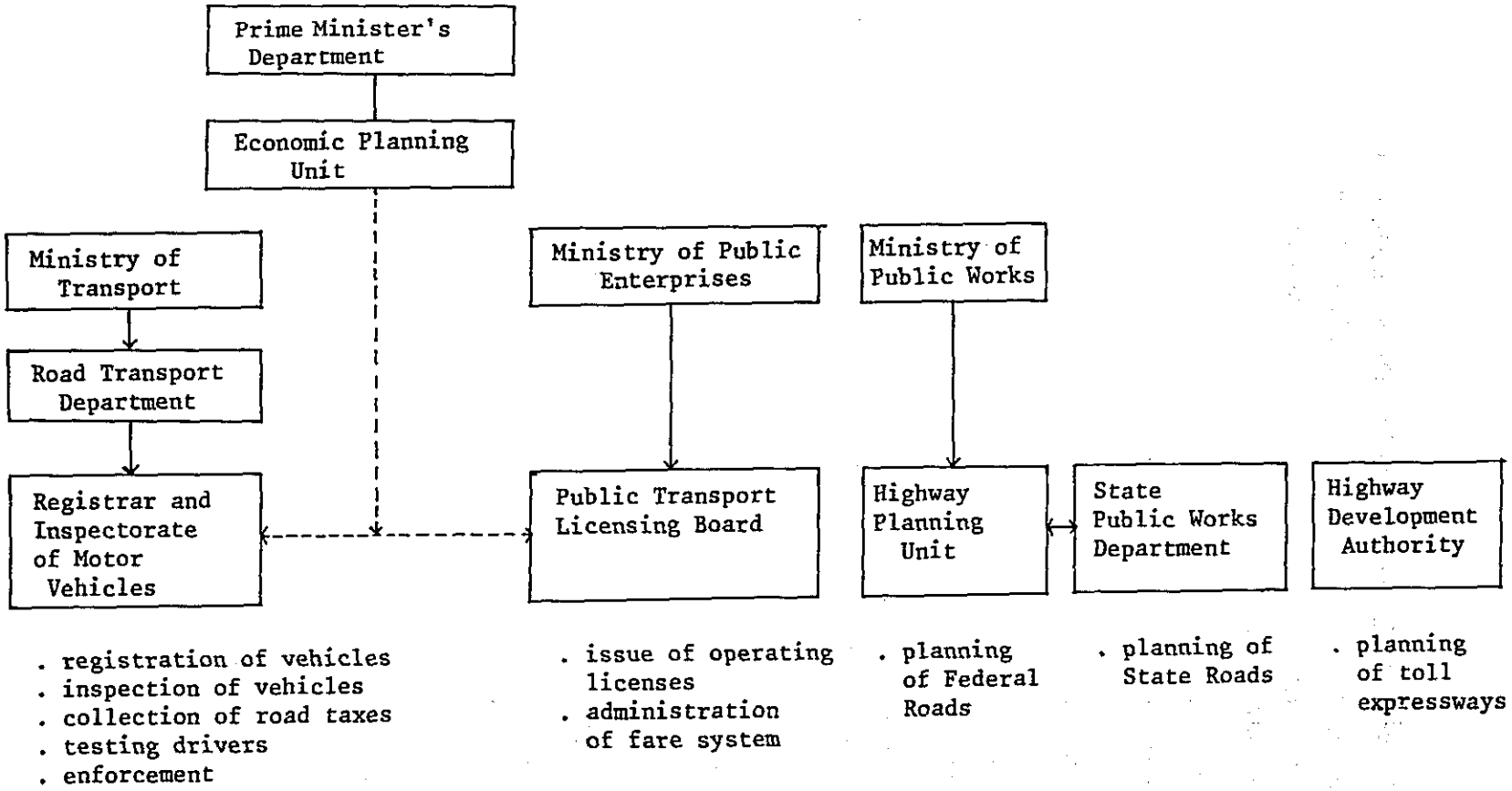


Fig. 1.1 : Government Organization for Road Public Transport

1.3 Ordinances affecting Road Public Transport

1.3.1 Definition of Modes

Road Public Transport is governed by the Road Traffic Ordinance (Part V Section 93). The following modes are defined:

- school bus
- stage bus
- charter bus
- excursion bus
- express bus
- taxicab
- hire car

There is no special category for Mini-bus Factory buses are operated under the category of charter bus.

The definition of these modes, from the statutory point of view, in terms of capacity, method of payment and restriction on use is tabulated in Table 1.2. This is self-explanatory.

In addition to these restrictions, the taxi must be fixed with a taximeter (checked by RIMV). Regulations appear to be tighter on the taxicab and hire car (inter town taxi) which have many characteristics in common with private cars. Regulations appear to be not so strict with stage buses. The restriction on factory and school buses appear to be in between.

Table 1.2 Statutory Definition of Public Road Transport Modes

	Capacity	Payment	restriction on use
a) School bus	-	separate	to be used exclusively for transporting pupils and school staff.
b) Stage bus	-	separate	authorised route and fare stage but no fare stage exceeding twenty miles in length.
c) Charter Bus (factory bus)	-	single (single)	- (to be used exclusively for transporting workers of factory).
d) Excursion Bus	-	separate	to be used for excursion only, no fare state
e) Express Bus	-	separate	few bus stops; more than 10 mile journey; no fare stage.
f) Taxi cab	not more than six persons	single	for urban transport; no station.
g) Hire car	not more than six persons	separate	for inter urban transport; can collect waiting passengers at fixed places (stations) only.

Source: Road Traffic Ordinance, Part V Section 93

1.4 Existing Public Transport Modes

The existing means of public transport in terms of capacity and distance available in the Study Area may be schematically shown as Fig. 1.2 below. The report will detail their operating characteristics and present level of services. It will be concluded with an anlysis of problems and capacity journey length configuration not provided for.

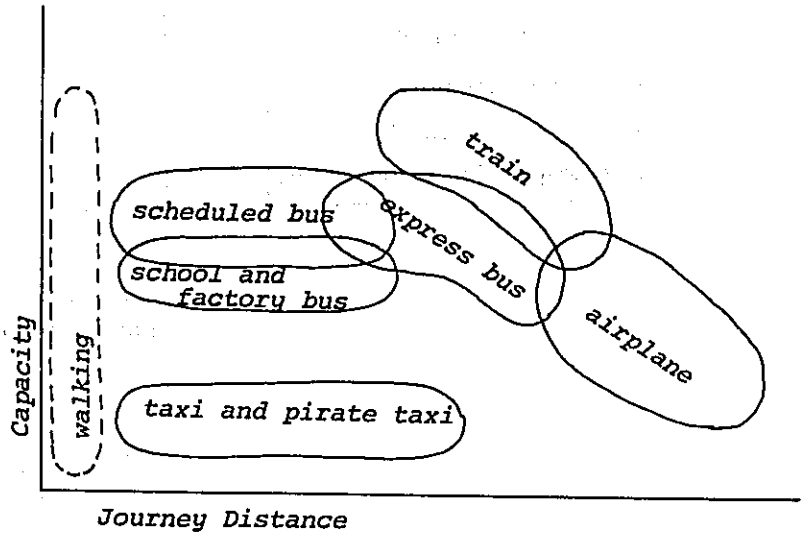


Fig. 1.2 CONCEPTUAL MODEL OF PUBLIC TRANSPORT AVAILABILITY IN JOHOR BAHRU CONURBATION

Essentially these services currently available may be divided into 3 categories, viz:

urban : serving mainly within the Municipality

intra-regional : based in the Study Area, providing services to and from Johor Bahru.

inter-regional : based both inside and outside the Study Area, providing services to and from these areas to Johor Bahru

1.5 Organization of Report

Urban and intra-regional services are closely linked and shall be studied together. Inter-regional services are different particularly in the modes of travel and are analysed separately.

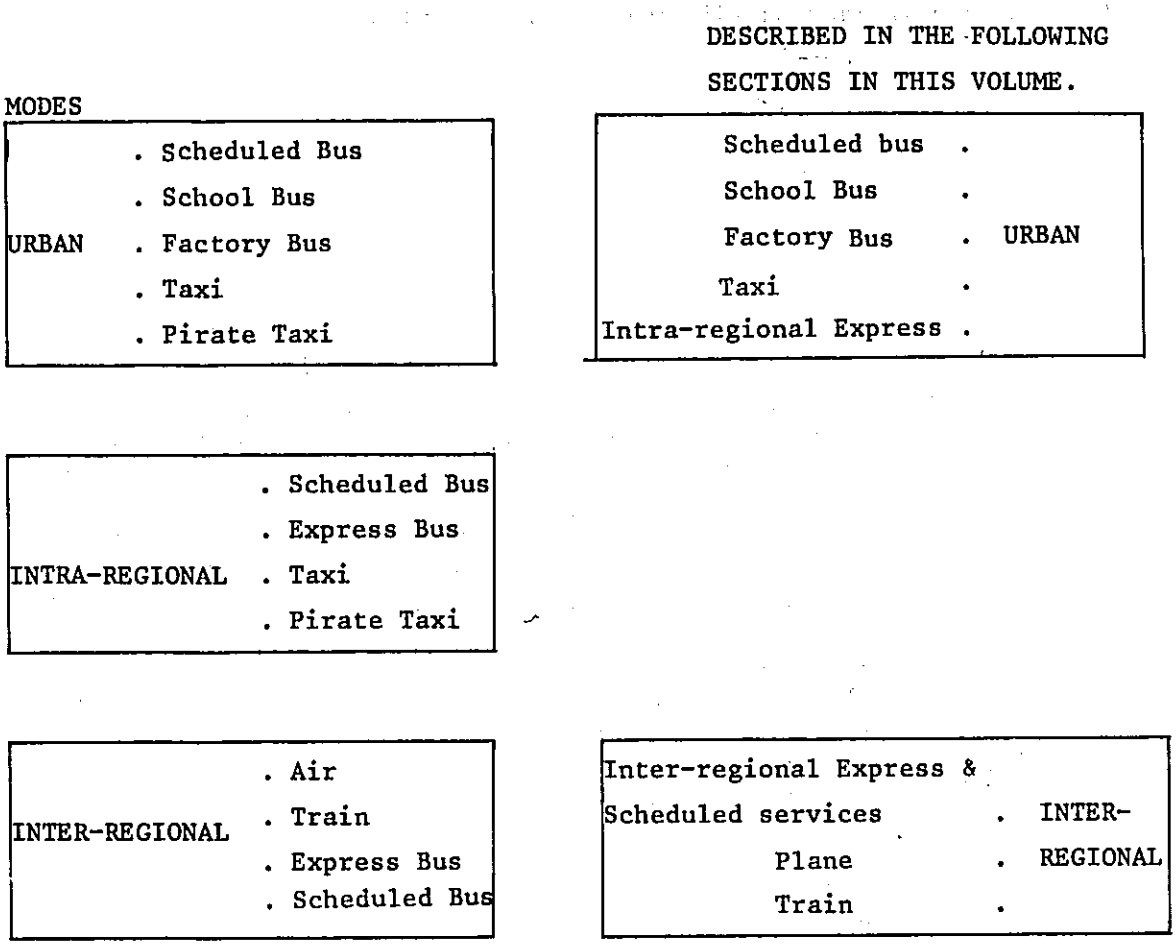


Fig. 1.3 : Organization of Report

2. PLANNING METHODOLOGY AND SURVEY

2.1 Public Transport Planning Survey

The survey and planning process for public transport is shown diagrammatically in Fig 2.1 below

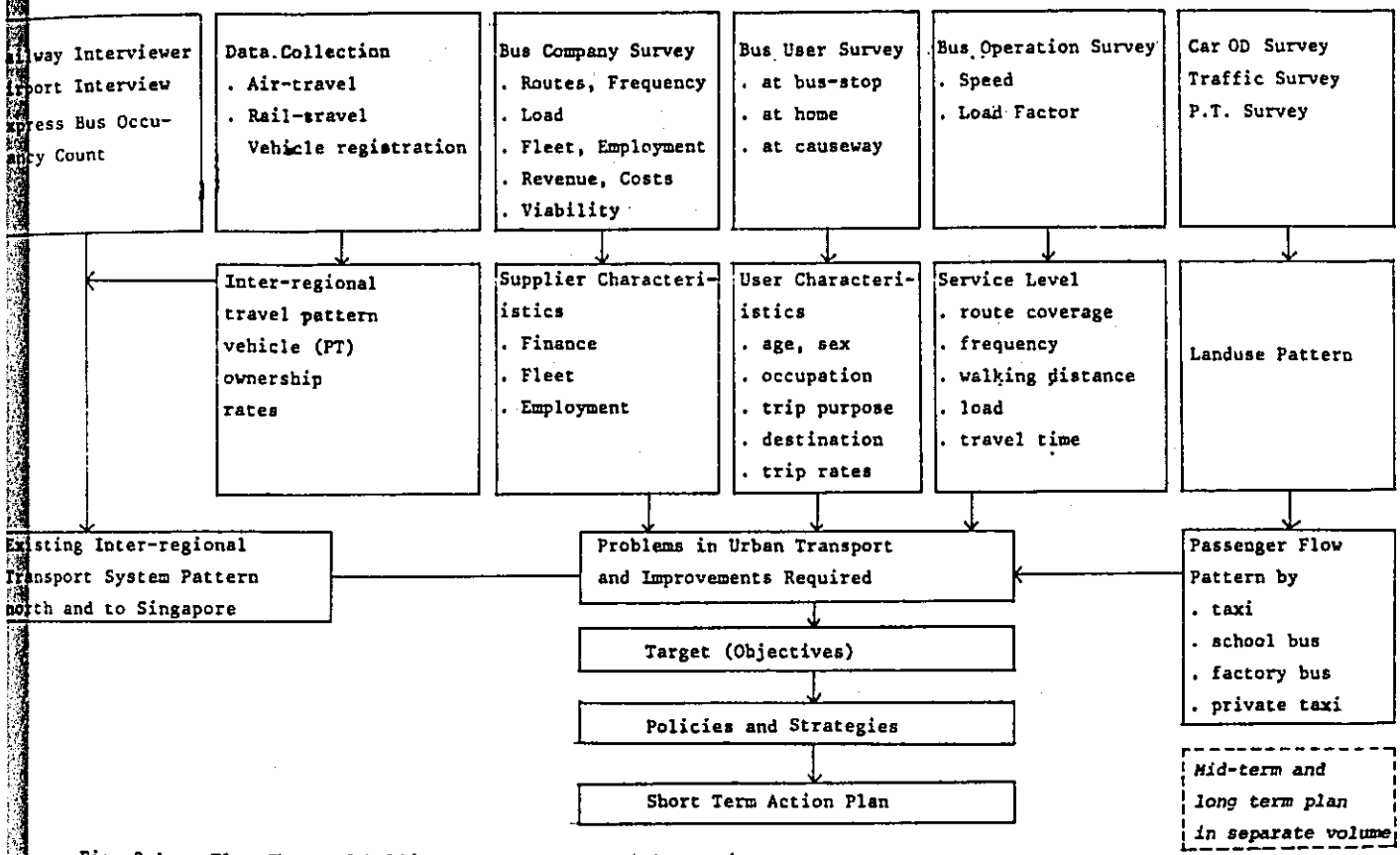


Fig. 2.1 : Flow Chart of Public Transport Survey and Planning Process.

2.2 Data Collection

Data was collected from the following sources

i) Registrar and Inspectorate of Vehicles:-

List of scheduled bus companies number of school and factory buses

ii) Department of Civil Aviation:-

Air traffic characteristics in Peninsular Malaysia in general and Senai in particular

iii) Keretapi Tanah Melayu:-

Rail travel characteristics in Peninsular Malaysia and traffic in the Johor Bahru Station.

2.3 Surveys

2.3.1 Bus Company Survey

The objective of this survey was to collect information on bus company characteristics, fleet characteristics and the level of service provided by the bus companies operating in the Study Area.

The list of scheduled and express bus companies operating in the area was taken from RIMV records. Questionnaires were sent to all these bus companies. All were returned except from Pontian bus. However, some of the questionnaires were incomplete because data was not available.

2.3.2 Bus User Interview Survey

The objective of this survey was to collect information on the personal and trip characteristics of bus-passengers and also to sample their opinions.

This survey was conducted at selected bus-stops. These were chosen to represent a range of landuses, viz

Town Centre - 1. Jalan Ah Fook (UMNO bus-stop)
2. Jalan Tun Abdul Razak
Town - 3. In front of Majlis Perbandaran
Periphery - Johor Bahru

	4. In front of Convent School
Medium Density Residential	5. Jalan Tebrau, near junction with Jalan Utama
	6. Jalan Tebrau, opposite Police Depot
Low Density Residential	7. Jalan Scudai, near Jalan Wasina
	8. Jalan Abdul Samad.
Industrial	9. Jalan Tampoi, near Jln Datin Halimah
Village	10. Ulu Tiram
Regional Towns	11. Kulai
	12. Kota Tinggi
	13. Pontian

A sample size of 100 interviews was taken for stations 1 and 2 and samples of 50 were taken for station 3 to 12. For stations 1 and 2, interviews were conducted from 6 a.m. to mid-night. Interviews were conducted from 7 a.m to 6 p.m for other stations.

2.3.3 Home Interview Survey (Public Transport)

The objective of this survey was to collect trip generation characteristics, opinions of bus service by users and non-users, and their reactions to suggested solutions.

The samples were stratified by land use and distance from bus-stops. Households were selected by the enumerator. The following number of households were interviewed in each zone.

Land-use \ Distance from bus -stop		Number of Households Interviewed				
		0-100m	100-250m	250-500m	500-1000m	1000m
Town Centre	Zone 111	15				
Town Periphery	Zone 114	10	5			
Medium Density	Zone 261	3	3	3	3	3
Residential	Zone 331	3	3	3	3	3
Low Density Residential	Zone 213	3	3	3	3	3
Ulu Tiram		3	3	3	3	3
Pontian		3	3	3	3	3
Kulai		3	3	3	3	
Kota Tinggi		3	3	3	3	3

Only three members above 7 years of age were interviewed in each household, giving a sample of 45 in each zone and a total of 405 respondents.

2.3.4 Bus Operation Survey

The objective was to study loading factors and travel time and speed.

The following bus routes were chosen to reflect different landuses.

Route No.	To/From	Landuse Type
51	Century Gardens	Residential : Housing Estate
211	Kg. Melayu	Residential : Kampong
8	Kolam Ayer	Residential : Low Density
14	Tampoi	Industrial
5	Kulai	Regional Centres
6	Pontian	"
41	Kota Tinggi	"

The surveys were carried out approximately during the following hours.

7.00 a.m. to 9.00 a.m.
12.00 noon to 2.00 p.m.
4.30 p.m. to 6.30 p.m.

2.3.5 Passenger Counts at Bus-stops

The number of passengers boarding and alighting from buses were taken at two bus-stops from 6 a.m to 12 p.m. The bus-stops were selected from the three major bus-stops in the CBD.

2.3.6 Airport and Railway Station Interviews

Arriving and departing passengers at Senai Airport were interviewed to collect passenger and trip characteristics and opinions. A sample of 40 arriving and 60 departing passengers was taken.

A similar survey was undertaken at the Railway Station. The sample was further stratified into passengers by express trains and by ordinary trains.

2.3.7 Passenger Counts for Express Buses

Information on number of passengers booked on each express bus trip departing from Johor Bahru was obtained from the booking offices. Where not available, this was supplemented by counts at the bus-station.

2.3.8 Bus User Interview and Counts at Causeway

A sample of 2000 respondents were interviewed at the causeway to elicit their trip purpose, origin and destination. Some 1000 were interviewed on Sunday and another 1000 on Monday over a 16 hour period from 6 a.m. to 10 p.m. A count on the number of bus passengers was also undertaken for the two days.

URBAN & INTRA - REGIONAL

3.0 URBAN AND INTRA-REGIONAL TRAVEL DEMAND

The factors affecting mode choice are examined in this chapter for differing landuses and towns. A sample of five zones in the Johor Bahru municipal area and the towns of Ulu Tiram (rural town) and Pontian, Kulai and Kota Tinggi (regional centres) were selected. In the MPJB area, zone 111 was selected to represent the town centre, zone 114 the town periphery and zone 213 to represent low density residential areas. Medium density residential areas were represented by zone 261 (Taman Maju Jaya and Pelangi) where the housing is similar to the new housing estates built and being built in and around Johor Bahru town. Zone 331 (Kampung Melayu) is representative of an urban kampung. Fifteen households and 45 households members were interviewed in each zone.

A comparison of urban transports modes is summarized and conclusions on the urban transport scenario in the study area drawn at the end of the chapter.

3.1 Zone Characteristics

3.1.1 Household Characteristics

Household size, income and vehicle ownership rates are shown in Table 3.1 and occupation of household heads in Table 3.2

The town centre is characterized by household sizes conforming to the national urban average of 5.4. Mean income and car ownership rates are low. Household heads are mainly in the service sector (87%).

The town periphery is characterized by household sizes of 5.7, slightly higher than the national urban average. It is a medium income zone with car and motorcycle ownership rates of 47% each. Only 27% of the households are without a car or motorcycle. Household heads are also mainly in the service sector (53%).

The low density residential area is characterized by large household sizes high income and low vehicle ownership rate. Bus services here are generally good and this may account for the low incidence of car and motorcycle ownership. Some 60% of household heads are in the service sector.

The housing estate is characterized by low family size, high income and high vehicle ownership rates. The household heads are mainly in the administrative and managerial and sales sectors.

The urban kampung is characterized by large household size, low income but high vehicle ownership. A third of the households are pensioners. The employed household heads are mainly in the service sector.

Ulu Tiram is characterized by large household size, low average income and low vehicle ownership. The occupation of household heads are varied with factory, construction and transport, agriculture and fishery being the two dominant sectors.

The regional towns of Pontian, Kulai and Kota Tinggi are characterized by large families, high income and high vehicle ownership rates. In Pontian heads of interviewed households were mainly in the administrative and managerial, and service sectors while in Kota Tinggi they were mainly in the service sector. In Kulai, the predominant occupations are sales and agriculture.

Table 3.1 : Household Size, Income and Vehicle Ownership Characteristics by Zone

Zone	Mean Household Size (Persons)	Mean Household Income (M$)	Cars per 100 Household	Motorcycles per 100 Household	Households without vehicle (%)
Town Centre	5.32	450	0	0	100%
Town Periphery	5.73	680	46.7	46.7	26.7
Low Density Residential	6.94	900	26.7	33.3	46.7
Housing Estate	4.66	1170	80.0	66.7	0
Urban Kampung	6.41	570	46.7	33.4	40.0
Ulu Tiram	6.07	510	6.7	20.0	73.3
Pontian	6.40	1190	73.3	20.0	26.7
Kulai	6.14	1140	53.3	13.3	46.7
Kota Tinggi	5.67	1080	53.3	33.4	33.3

Source : Urban Transport Study , Johor Bahru, 1981.

Table 3.2 : Occupation of Household Heads by Zone

Zone	Professional & Technical	Admin & Managerial	Clerical & Related	Sales	Service	Factory Const. & Transport	Agriculture & Fishery	House wife	Others
Town Centre	-	-	-	6.7	86.7	6.7	-	-	-
Town Periphery	-	-	26.7	13.3	53.3	-	-	-	6.7
Low Density Residential	-	-	13.3	6.7	60.0	20.0	-	-	-
Housing Estate	-	33.3	-	53.3	13.3	-	-	-	6.7
Urban Kampung	6.7	-	13.3	33.3	13.3	-	-	-	33.3
Ulu Tiram	6.7	-	13.3	6.7	13.3	33.3	26.7	-	-
Pontian	6.7	33.3	6.7	-	33.3	13.3	6.7		
Kulai	-	-	-	53.3	6.7	6.7	33.3		
Kota Tinggi	-	-	13.3	13.3	53.3	6.7	-		13.3

Source : Urban Transport Study, Johor Bahru, 1981

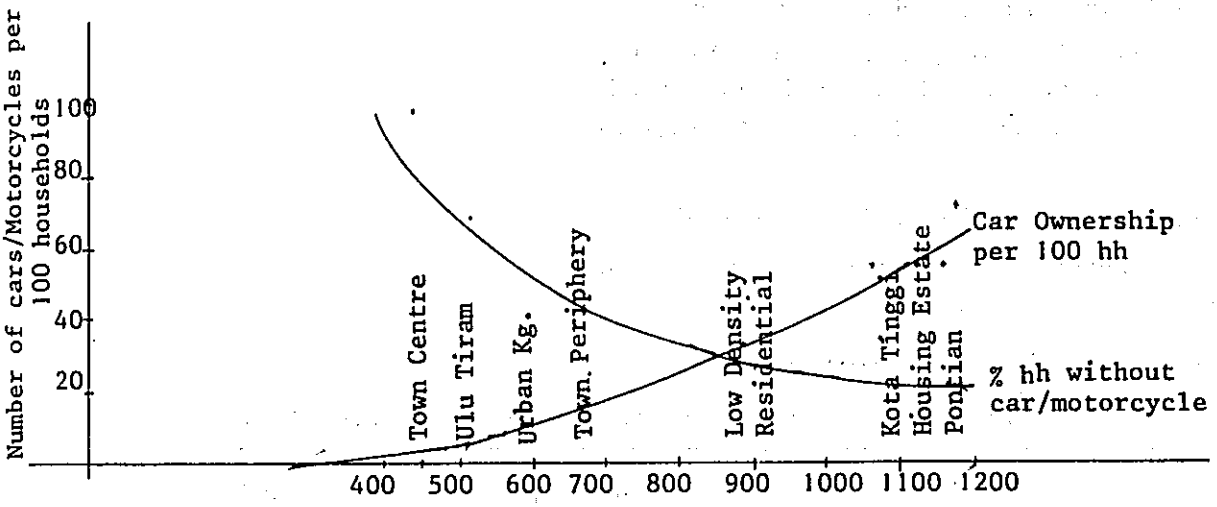


Fig. 3.1 : Vehicle Ownership and Zonal Income Comparison between Zones

3.1.2 Personal Characteristics of Respondents

Sex, age and vehicle ownership characteristics of the respondents are shown in Tables 3.3. Their occupations are shown in Table 3.4.

The sex ratio of the zones vary within ± 12% from the mean of 50. The zonal trip characteristics sampled is thus not expected to be unduly influenced by the sex of respondents.

The age of respondents centre around 30 years except that for respondents from the urban kampung which is higher because of the incidence of pensioners among the respondents.

The car ownership characteristics vary from a low of zero to a high of 71%. Trip characteristics are thus expected to be highly influenced by vehicle ownership.

Discounting housewives and students whose occupations are usually independent, the occupations of respondents tend to be closely associated with the occupation household heads.

Table 3.3 : Personal Characteristics of Home Interview Respondents.

Zone	Sex		Age	Car Ownership	Motorcycle Ownership
	Male (%)	Female (%)	(%)	(%)	(%)
Town Centre	46.7	53.3	28.7	0	0
Town Periphery	56.5	44.4	27.4	20	17.7
Low Density Residential	48.9	51.1	29.5	6.7	4.4
Housing Estate	62.3	37.7	32.3	71.1	24.4
Urban Kampung	53.3	46.7	36.9	40	26.6
Ulu Tiram	60.0	40.0	31.1	6.7	8.8
Kulai	53.3	46.7	31.8	15.5	4.4
Kota Tinggi	57.7	42.3	31.2	37.7	11.1

Source: Urban Transport Study, Johor Bahru, 1981.

Table 3.4 : Occupation of Home Interview Respondents

Percentage

	Admin. & Managerial	Prof. & Tech.	Clerical	Sales	Service	Factory Const & Transport	Agri etc	Student	Housewife	Other	Employed
Town Centre	-	-	4.4	2.2	22.2	8.8	-	35.5	24.4	2.2	45.6
Town Periphery	-	-	26.6	4.4	20.0	6.7	-	26.6	13.3	2.2	60.1
Low Density Residential	-	2.2	11.1	4.4	24.4	2.2	2.2	28.8	24.4	-	46.8
Housing Estate	8.8	4.4	35.5	17.7	4.4	-	-	11.1	17.7	-	71.2
Urban Kampung	-	4.4	8.8	4.4	8.8	13.3	-	26.7	28.9	4.4	44.4
Ulu Tiram	-	2.2	6.7	4.4	2.2	24.4	8.8	20.0	28.9	-	51.1
Pontian	11.1	8.8	8.8	2.2	15.5	2.2	2.2	26.6	22.2	-	51.2
Kulai	-	-	-	48.9	4.4	4.4	20.0	11.1	8.8	2.2	80.1
Kota Tinggi	-	-	8.8	4.4	31.1	15.5	-	8.8	22.2	4.4	69.0

Source : Urban Transport Study, Johor Bahru, 1981.

3.2 Trip Characteristics

3.2.1 Trip Production And Trip Purpose

There is an average of 1.92 one-way trips per person per day or 5.75 round trips per person per week. New housing areas stand out in terms of trip production at a rate of 8.2 round trips per person per week. Regional towns are higher than average in trip production ranging from 6.0 to 6.6 round trips per person per week. The town centre, town periphery and urban kampung show trip production rates less than the average, ranging from 5.0 to 5.4 round trips per person per week. The low density residential area and rural town of Ulu Tiram show low trip production rates of 4.9 and 4.4 round trips per person per week respectively.

The high trip rates in the new housing areas may be explained by the high production rate for non-week/non-school trips (3.5 round trips per person per week). The low trip production rate in the town centre and Ulu Tiram may be explained by the low rate for work trips (2.5 trips per person per week). Since 5 to 6 work trips per worker each week is about the norm, this low rate may be due to the combination of work and residential places, ie the respondents work on the ground floor and live on the upper floor of the shop houses in town. This partly accounts for Kulai's low trip rate, vis-a-vis Kota Tinggi and Pontian.

Other than the above mentioned anomaly, work trip production rates are uniform, irregardless of income level. In the new housing estate, non-work/non-school trip rates are high in accordance with the income and car-ownership levels. In the regional towns, although the income level is on par with that of the new housing estates, the number of non-work/non-school trips is about half that of the latter. In the town centre and Ulu Tiram, the number of non-work/non-school trips per resident is about the same level as the regional towns although income level is much lower. The non-work/non-school rate in the urban kampung, town periphery and low density residential area is lower although income levels are higher.

Table 3.5 Trip Destinations*

	Johor Bahru	S'pore	Pontian	Kulai	Kota Tinggi	Ulu Tiram	Pasir Gudang	Other	Total
Town Centre	226 100%								226
Town Periphery	237 96.3%	9 37%							246
Low Density Residential	222 100%								222
Housing Estate	303 82.9%	37 10.0%						26 7.1%	368
Urban Kampung	159 66.3%	23 9.6%						58 24.2%	240
Ulu Tiram	91 45.7%	18 9.0%	2 1.0%	-	20 10.0%	49 24.6%	17 8.5%	2 1.0%	199
Pontian			287 100%						287
Kulai		2 0.7%		269 .99%					271
Kota Tinggi	9 6.0%	1 0.3%			282 95.3%	4 1.4%			296

* Absolute number of trips is for one week for 45 persons
Source: Urban Transport Study, Johor Bahru, 1981.

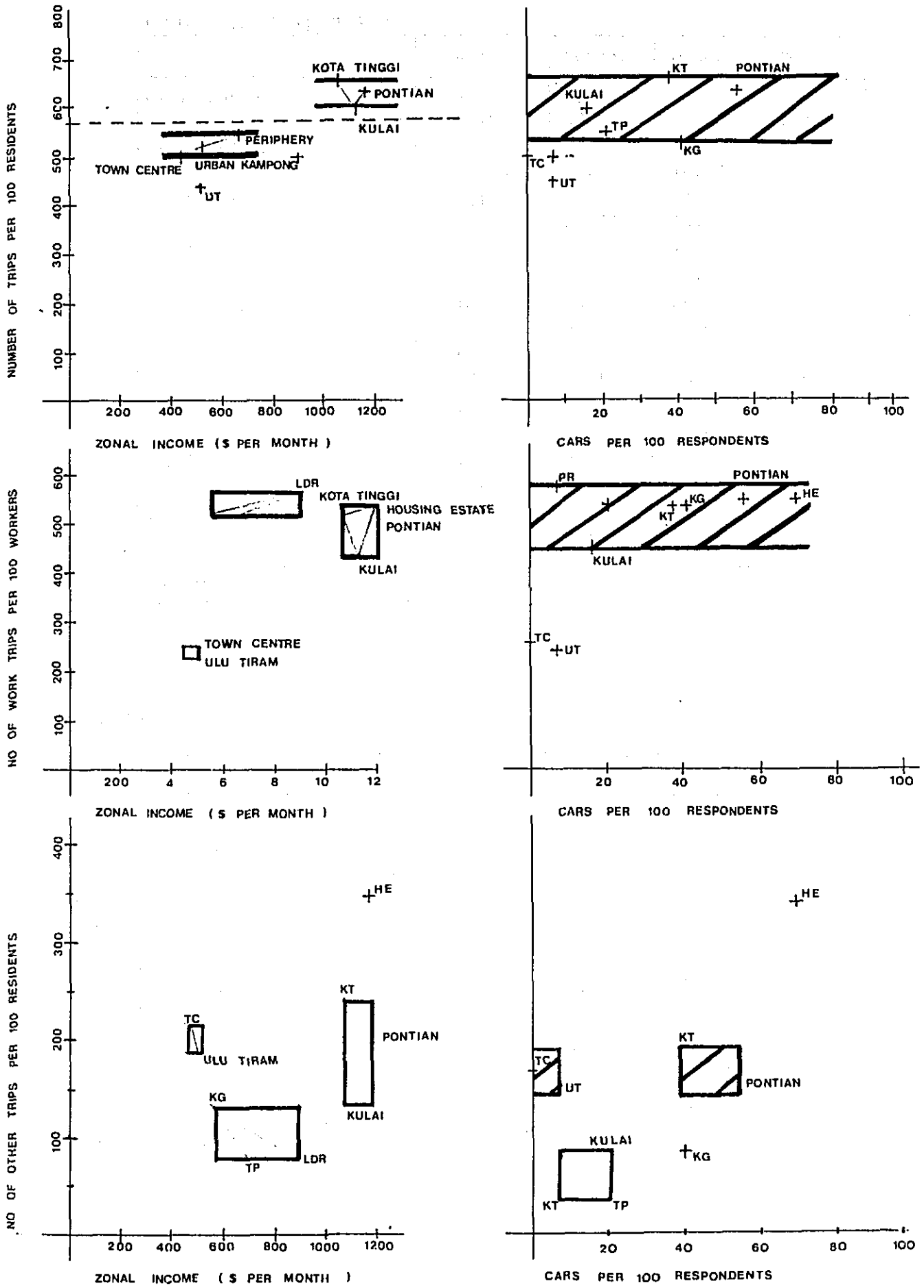


FIG. 3·2 TRIP GENERATION COMPARISIONS (21)

Table 3.6 Trip Purpose*

	Work	School	Others	Total
Town Centre	51 22.6%	81 30.5%	94 35.3%	266 100%
Town Periphery	141 57.3%	65 26.4%	40 16.2%	246 100%
Low Density Residential	121 54.5%	66 29.7%	35 15.7%	222 100%
Housing Estate	177 48.1%	31 8.4%	160 43.5%	368 100%
Urban Kampung	105 43.7%	75 31.3%	60 25.0%	240 100%
Ulu Tiram	54 27.1%	58 29.1%	87 43.7%	199 100%
Pontian	127 44.2%	70 24.4%	90 31.4%	287 100%
Kulai	175 64.6%	34 12.5%	62 22.9%	271 100%
Kota Tinggi	162 54.7%	27 9.1%	107 36.1%	296 100%

* Absolute number of trips is for one week for 45 persons
Source: Urban Transport Study, Johor Bahru, 1981.

Table 3.7 Weekly Frequency by Purpose of Local Trips

	Work Trips per 100 Workers	School Trips per 100 Students	Other Trips per 100 Housewives	Other Trips per 100 Population
Town Centre	248	507	856	208
Town Periphery	522	543	668	88
Low Density Residential	514	509	318	77
Housing Estate	552	626	2008	355
Urban Kampung	525	624	461	133
Ulu Tiram	235	644	668	193
Pontian	551	584	900	200
Kulai	485	680	1560	137
Kota Tinggi	522	681	1071	237

Source: Urban Transport Study, Johor Bahru, 1981.

3.2.2 Destinations

Most of the trips originating in Johor Bahru are confined to Johor Bahru (Table 3.5). Less than 10% of the trips were to areas outside the town. Out of town trips are mainly to Singapore. Travel to Singapore is comparatively high from the new housing estate and the urban kampung

Trips from the regional towns are also very localised, ie within the same town. Only in the rural town of Ulu Tiram is travel more dispersed. Almost half the trips are to Johor Bahru. A quarter of the trips are within the town and about 10% and 9% of the trips are to Kota Tinggi and Pasir Gudang respectively.

3.2.3 Mode Choice Of Local (Within Town) Trips

In the town centre, where vehicle ownership is low, some 80% of the trips are by public transport, the remainder being on foot (See Table 3.8) The work trips are equally by scheduled bus and taxi while school trips are mainly by school bus (two-thirds) and scheduled bus (20%).

In the town periphery, with 20% of the respondents owning cars and 18% motorcycles, some 24% and 15% of the trips are by car and motorcycle respectively. Some 60% of the trips are by public transport. Work trips are mainly by car (38%), stage bus (31%) and motorcycle (24%). School trips are mainly by stage bus (90%) with school bus accounting for 10%. Other trips are mainly by stage bus (87%). It thus appears that in the town periphery the stage bus is the most important means of transport surpassed by the private car only in work trips.

The low density residential area is characterised by fairly high zonal income ($900) and lower than proportionate vehicle ownership. Some 55% of trips are by public transport (with about half by taxi). Work trips are by taxi (45%) and motorcycle (20%). School trips are mainly on foot (more than half) and school bus (many schools are located in the sampled zone).

In the housing estate, where income level is high and all the respondents had either a car or motorcycle, some two-thirds of work trips are by car, one-third by motorcycle. School trips are mainly by car. Other trips are also mainly by car and motorcycle. Public transport accounts for only 5% of the trips.

The urban kampung evinces a low income level and a higher than proportionate level of car ownership. Despite the higher car ownership level, public transport is still used for more than half the trips. Some 60% of work trips are by car or motorcycle, with 20% by taxi. School trips are mainly by scheduled bus and on foot (one-third each).

In the rural town of Ulu Tiram, the main mode of transport on local trips (within town) is on foot (half) and school bus (one-quarter). The walking trips are mainly for non-work/non-school purposes (two-thirds) and to school (one-third). Three quarters of the school trips were by school bus.

In the regional towns of Pontian, Kulai and Kota Tinggi where the respondents' income level and car ownership is high, the car is the main means of transport for local trips. In Pontian, it is the most important mode, accounting for almost all of the trips recorded while in Kulai and Kota Tinggi it is the second most important means. In the latter two, the scheduled bus is the most important, the more so for Kulai, where some 60% of the trips are by bus. This may be due to the location of Kulai on the main trunk road, Federal Route 1, where the level of service is

higher than either Pontian and Kota Tinggi which are not on the main road.

Table 3.8: Trip Frequency by Mode (Percentage)

	Stage bus	School/Factory Bus	Taxi	Car	M/cycle	Others	Total (actual number per 45 persons)	Sub-total by Public Transport (%)
Town Centre	35.0	23.4	19.9			21.7	226	78.3
Town Periphery	52.8	2.4	4.1	22.4	13.8	0.8	246	59.3
Low Density Residential	11.3	16.7	26.6	7.7	10.8	27.0	222	54.6
Housing Estate	1.1	-	4.3	66.8	27.7	10.3	368	5.4
Urban Kampong	17.1	20.0	17.5	14.1	12.9	18.3	240	54.6
Ulu Tiram	23.6	24.1	9.5	8.5	7.0	27.1	199	57.2
Pontian.	4.5	25.4	13.9	45.1	31.4	17.8	287	43.8
Kulai	63.8	6.3	4.4	22.9	2.6	-	271	74.5
Kota Tinggi	37.8	16.9	1.4	27.4	16.5	-	296	56.1

Source: Urban Transport Study, Johor Bahru, 1981.

Table 3.9 : Mode and Purpose of Trips from Town Centre

	Work(%)	School(%)	Others(%)	Total(%)
Stage Bus	10.6	8.0	16.4	35.0
School/Factory Bus	-	23.5		23.5
Taxi	11.9	2.2	5.8	19.9
Car				
M/cycle				
Others		2.2	19.5	21.7
Total	22.5	35.8	41.6	100

Source: Urban Transport Study, Johor Bahru, 1981.

Table 3.10 : Mode and Purpose of Local Trips from Town Periphery

	Work	School	Others	Total
Stage Bus	18.5	24.9	11.4	54.8
School + Factory Bus	-	2.5	-	2.5
Taxi	4.2	-	-	4.2
Car	22.4	-	0.8	23.2
M/cycle	14.3	-	-	14.3
Others	-	-	1.0	1.0
Total	59.4	27.4	13.2	100

Source: Urban Transport Study, Johor Bahru, 1981.

Table 3.11 : Trip Mode and Purpose of Local Trips (from Residential Areas)

	Low Density Residential				Housing Estate				Urban Kampung			
	Work	School	Others	Total	Work	School	Others	Total	Work	School	Others	Total
Stage Bus	8.1	-	3.2	11.3	-	-	0.3	0.3	3.8	11.9	6.3	22.0
School/ Factory Bus	5.4	11.3	-	16.7	-	-	-	0	-	3.8	-	3.8
Taxi	24.8	-	1.8	26.6	2.0	1.6	-	3.6	7.5	3.2	12.2	22.9
Car	2.7	2.3	2.6	7.6	36.4	8.2	21.3	65.9	7.5	3.1	2.5	13.1
M/cycle	10.8	-	-	10.8	19.7		10.5	30.2	14.5	0	2.5	17
Others	2.7	16.2	8.1	27.0	-	-	-	-	3.8	10.7	6.7	21.2
Total	54.5	29.8	15.7	100	58.1	9.8	32.1	100	37.1	32.7	30.2	100

Source: Urban Transport Study, Johor Bahru, 1981.

Table 3.12 : Trip Mode and Purpose of Local Trips (Within rural and regional towns)

	Ulu Tiram				Pontian				Kulai				Kota Tinggi			
	Work	School	Others	Total	Work	School	Others	Total	Work	School	Others	Total	Work	School	Others	Total
Stage Bus	2.0	-	-	2.0	-	3.5	1.0	4.5	36.1	4.8	20.4	61.3	19.1	2.8	16.7	38.7
School/ Factory Bus	-	28.6	-	28.6	3.1	12.5	9.8	25.4	-	7.8	0.7	6.3	10.3	6.7	0.7	17.7
Taxi	2.0	8.2	2.0	12.2	1.4	-	-	1.4	4.1	-	0.4	4.5	-	-	-	-
Car	-	4.0	2.0	6.1	33.1	1.7	10.8	45.6	22.7	-	0.4	23.0	15.2	-	11.7	26.9
M/cycle	-	-	2.0	2.0	1.7	-	1.4	3.1	2.2	-	0.4	2.6	11.3	-	5.3	16.7
Others	12.2	-	36.7	49.0	4.9	6.6	8.4	19.6	-	-	-		-	-	-	
Total	16.3	40.8	42.9	100	44.3	24.4	31.4	100	65.0	8.9	42.8	100	56.0	9.6	34.4	100

Source : Urban Transport Study, Johor Bahru, 1981.

3.2.4 Inferences on Trip Characteristics

Several inferences may be drawn from the above information.

1. The number of school and work trips are generally independent of income, vehicle ownership and landuse characteristics. Exceptions occur, as in the town centre, when a proportion of the residents live and work within the same dwelling.

2. Trips other than to work and school are influenced by income level and vehicle ownership. However excepting the town centre where the level of public transport service is high and Ulu Tiram where most non-work non-school trips are on foot, the number of non-work/non-school trips increase in proportion to zonal income and vehicular ownership.

3. Most trips are within town, except in the rural town of Ulu Tiram where residents have to travel for better job and school facilities.

4. Out of town trips are mainly to Singapore for non-work/non-school purposes. These trips are strongly correlated with income level and vehicle ownership

5. The number of trips from the new housing estate is disparately high. Although the sampled area is not well-served by public transport, it may be inferred that traffic generated from new housing estates that are being developed in and around Johor Bahru would be high.

3.2.5 Mode Choice of Inter-urban trips

The low number of inter-urban trips preclude any meaningful analysis, except for trips to Singapore, where a total of 90 trips were recorded.

The residents in the town centre, periphery and low density residential area are not frequent visitors to Singapore. Trips from the housing estate are non-work/non-school trips, where some 76% are by car 16% by motorcycle and 8% by taxi. The trips from the urban kampung are mainly to work and are by factory bus. The trips from Ulu Tiram are partly to work (33%, all by factory bus) and mainly for non-work / non-school purposes (predominantly by bus).

Table 3.13 : Mode and Purpose of Trips to Singapore

	Housing Estate				Urban Kampung				Ulu Tiram			
	Work	School	Others	Total	Work	School	Others	Total	Work	School	Others	Total
Stage Bus	-	-	-	-	-	-	-	-	-	-	38.9	38.9
School/ Factory Bus	-	-	-	-	100	-	-	100	33.3	-	5.5	38.9
Taxi	-	-	8.1	8.1	-	-	-	-	-	-	11.1	11.1
Car	-	2.7	73.0	75.7	-	-	-	-	-	-	-	-
M/cycle	-	-	16.2	16.2	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	11.1	11.1
Total	0	2.7	97.3	100	-	-	-	100	33.3	0	136.7	100

Source: Urban Transport Study, Johor Bahru, 1981.

3.3 COMPARATIVE ADVANTAGE BETWEEN MODES

3.3.1 Urban Transport Modes

Public transport in Urban Johor Bahru is provided by scheduled buses, school and factory buses and legal and pirate taxis. Unlike scheduled bus, taxis are not fixed route and fixed schedule vehicles. They should therefore able to pick up passengers nearer to their houses and drop passengers at their destinations. However the first frequently does not hold true as cruising taxis tend to ply the main access roads. Sometimes it is necessary for potential passengers to walk further to catch a taxi earlier. Nevertheless taxis have the advantage of dropping passengers at their destinations.

In Johor Bahru, a peculiarity exists in the taxi service. Because of competition from (unlicensed) pirate taxis, taxis invariably pick up other passengers on the trip to town. Generally the outward bound taxi is chartered unless the taxi-driver can collect passengers going to destinations near each other.

The taxi passenger pays a higher fare for the freedom of route. However on the trip to town, this is only about 50% more expensive. On the outward bound trip, the taxi fare is about 6 - 8 times higher.

Comparative advantages are listed in Table 3.14 below :

School and factory buses serve a select group of people ie. school children and factory workers. They differ from scheduled bus and taxi passenger trips in that they have a common destination : the school and factory. They also operate at particular times : beginning and end of the school session; beginning and end of the factory shift.

In terms of capacity of each mode and distance travelled, the urban transport situation in Johor Bahru may be schematically shown as in Fig. 3.1.

Table 3.14 : Comparative Advantage of Urban Public Transport Modes : Passengers Viewpoint

	Fare	Pick-up point	Waiting Time	Passenger Load	Seating Conditions	Air conditioning	Cleanliness	Walk to Destination
A. Scheduled Bus	lower	Bus-Stop	Irregular	Irregular May be over-crowded	Usually poor	No	Variable	Often Yes
B. Factory Bus, School Bus		House or Bus-Stop	Not so irregular	Constant	Usually better than A	No	Variable but generally better than A	Drop at destination
C. (Pirate Taxi)	higher on outward trip	House or nearest distributor	Very Irregular	May be alone or shared	May be poor, but usually good	Sometimes	Variable generally better than B	drop at destination
(Pirate Taxi)				Irregular	usually bad	No	generally poor	

3.3.2 Intra-regional Transport Modes :

Intra-regional public transport is provided by scheduled bus, express bus and taxi.

Express buses differ from scheduled buses in that they do not pick up passengers along the way although they can drop passengers in route. Since they make fewer stops, their travel time is much shorter. Express bus-fares are also higher.

A comparison of fare and travel time of selected destinations is given in Table 3.15 below. In other respects, scheduled buses and intra- regional express buses are similar.

Table 3.15 : Fare and Travel Time Comparison between Intra-Regional Transport Modes

Destination	Fare			Travel Time		
	Scheduled	Express	Taxi	Scheduled	Express	Taxi
Pontian	$1.80	$1.90	$4	85 mins	74 mins	74 mins
Kulai	$1.30	nil	$2.50	51 mins	-	30 mins
Kota Tinggi	$1.60	nil	$3	77 mins	-	45 mins

Source : Urban Transport Study, Johor Bahru, 1981.

At the intra-regional level, taxis offer only the advantage of shorter travel time. Passengers have to go to the taxi station just like bus passengers have to go to the bus-station. Taxis also drop passengers at the town bus-station. However, taxis can leave the moment there are enough passengers whereas buses have to wait for the scheduled departure time. Taxis travel faster than scheduled buses and slightly faster than express buses.

A comparison of travel time and fare by taxi and buses is given in Table 3.15 above.

4.0 SCHEDULED BUS SERVICES

4.1 Demand for Bus Services

The demand for bus travel expressed in trips per person per week and thousand trips per km^2 per week is shown in Table 4.1.

In terms of bus trips generated per person, the regional towns of Kulai and Kota Tinggi and the town periphery appear to be very high. In the case of Kulai, this high demand may be induced by the availability of bus services along Federal Route 1 and the availability of feeder services to the estates. In Pontian, the low rate appear to be because of a high percentage of trips by other modes.

Within Johor Bahru municipality the highest bus trip rates come from the town periphery (3.1 round trips per person per week) and the town centre (1.8). The difference between the two appear to be due to lower work and school trips from the town centre. The former may be due to a reduced need to travel to work because of people living and working in shop-houses. The latter may be due to a greater use of schoolbuses.

Within the residential areas, the number of bus trips per person per week is 0.56 for the low density residential area and 0.91 for the urban kampung. The number of trips from the housing estate is very low because of high vehicle ownership which in turn may be due to the low level of bus service.

In terms of trip demand per square kilometre, demand in the town centre and periphery is highest at about 19,000 trips per km^2 per week. For the residential area, demand is highest from the urban kampung (3,100), followed by the low density residential (1,300). The demand from the housing estate is low at 420. Demand from the regional towns are 50 trips per km^2 per week for Pontian, 750 for Kulai and 200 for Kota Tinggi.

Bus services are important in the town centre and periphery where the proportion of bus trips is 35% and 55% respectively. In the low density residential area the percentage is 11% and in the urban kampung 22%. In the housing estate the proportion is a very low 0.3%.

Bus services are vital to Kulai where 61% of the trips are by bus, and to Kota Tinggi (39%). Bus services do not appear to be very important in Pontian.

4.2 Bus Operations

4.2.1 Bus Company Characteristics: Finance, Fleet and Employment

There are three major scheduled bus companies operating in and out of Johor Bahru.

South Johor : which operates on the western sector of town and to Pontian, Kulai, Air Hitam and Gelang Patah.

Alec Bus : which operates on the eastern sector of town and to Kota Tinggi and other eastern towns.

T. Hakkim : which operates two routes in town.

One other companies offer inter-town services.

Syarikat Maju: which complements Alec Bus's service to Masai.

(In addition, Pontian Bus and Syarikat Kenderaan Melayu Pontian operate express services between Johor Bahru and Pontian, with the latter's going up to Benut. Singapore Bus Service operates one route to Johor Bahru at 5 minutes intervals and Singapore-Johor Bahru express operates on service every 7 minutes to Singapore). (Chapters 7 and 9)

TABLE 4.1 : BUS DEMAND RATES

ZONE		Zone No.	Population	Area (km^2)	Density (p/km^2)	TRIPS GENERATION (PER WEEK PER PERSON)				Low Trips Per km^2 Per Week ('000)
						To Work	To school	Others	Total	
Town	CBD	111	1,877	0.136	13,801	.533	.400	.822	1.756	24.2
	Town Periphery	114	2,036	0.324	6,284	.978	1.311	.800	3.089	19.4
	Low Density Residential	213	1,433	0. 620	2,311	.400	-	.156	.556	1.3
	Housing Estate	261	4,014	0.844	4,756	-	-	.089	.089	.42
	Urban Kampung	331	5,316	1,580	3,365	.267	.422	.222	.911	3.1
Rural Town	Ulu Tiram	371	3,467	25.71	13.5	.200	.267	.578	1.044	.14
Regional	Pontian	512	72,951	415.78'	175	- -	.222	.067	.289	.08 .05
Towns	Kulai	421 422	13,236 27,009	138.35 87.15	96 310	2.156	.289	1.267	3.711	.75
	Kota Tinggi	452 453	9776 20.566	136.85 247.47	71 83	1.200	.178	1.111	2.489	.20

Source : Urban Transport Study, Johor Bahru, 1981.

1. Financial Structure

The financial structure of bus companies are shown in Tables 4.2 and 4.3 below. The paid up capital of the three companies operating in town are in the ratio of 21 : 2 : 1. The disparity in paid-up capital is thus high. The smallest Company C has resorted to external loans. However the disparity of operating capital is still high (16 : 6 : 1).

In line with the New Economic Policy, the bumiputra share of Company A has increase from 25% in 1972 to 309 in 1980. Company C is totally Malay owned. However, Malay interest in South Johor Bus has withdrawn and it is now totally owned by non-Malays.

TABLE 4.2 : FINANCIAL STRUCTURE OF BUS COMPANIES

Company	Type of Service	Authorised Capital ($)	Issued Capital ($)	Malay Portion (%)	Long-term Loans $
A.	Town	1,000,000	322,700	30%	nil
B.	Town	3,500,000	3,260,000	nil	nil
C.	Town	500,00	155,200	100%	44,569
C.	Rural Feeder	200,00	50,000	nil	nil
D.	Rural Feeder	-	5,000	nil	nil

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.3 : CAPITAL STRUCTURE OF BUS COMPANIES (1972)

Company	Authorised Capital	Issued Capital	Appropriation from profits	Total	Malay subscribed of issued capital	Malay proportion of issued capital
A	3,500,000	3,260,000	-	3,260,000	815,000	25%
B	300,000	245,900	3,245,900	3,245,900	27,000	10.9%
C	500,000	57,300	29,883	71,183	57,300	100%

Source : South Johor Study, 1973.

TABLE 4.4 : SIZE OF BUS FLEET, 1981

	A	B	C	Total	Percentage Growth (% p.a.)
1976	46	70	17	133	
1977	46	72	17	135	1.5%
1978	48	76	18	142	5.2%
1979	58	74	19	151	6.3%
1980	60	70	20	150	-0.67%
1981	60	74	21	155	3.3%

Source : Urban Transport Study, Johor Bahru 1981.

2. Fleet Characteristics

The ratio of buses owned is more comparable (3.5 : 2.8 : 1). The number of buses owned by each of the three bus companies operating out of Johor Bahru is shown in Table 4.4. The growth in fleet size for each company has been very small. Table 4.5 shows the age of the bus fleet. Some 50% of the combined fleet is below 5 years old. About 26% is between 5 and 10 years old mainly in the South Johore and Alec fleets. The rate of replacement is shown in Table 4.6. The rate of replacement appears to be high (11%) for 1979 and 1980 but dropped to a marginal replacement rate of 2% in 1981.

In comparison with Penang Island and Province Wellesley (Table 4.8) it appears that the replacement rate of buses in the 10 plus age group in Johor Bahru is far behind. Although Johor Bahru's fleet shows a significantly higher percentage in the 3 to 10 age group, the replacement rate for the last two years has faltered.

TABLE 4.5. : AGE OF BUS FLEET (AS OF 1-10. 1981)

Bus Age	Number of Bus				
	A	B	C	Total	(%)
0 - 1 yr	5(6.7%)	2 (3.3%)	1(4.8%)	8	5.1
1 - 2	5(6.7%)	10(16.7%)	1(4.8%)	16	10.3
2 - 3	14(18.9%)	12(20.0%)	2(9.5%)	28	18.1
3 - 4	6(8.1%)	6(10.0%)	-	12	7.7
4 - 5	4(5.4%)	8(13.3%)	2(9.5%)	12	9.0
5 - 6	6(8.1%)	4 (6.7%)	1(4.8%)	11	7.1
6 - 7	2(2.7%)	3 (5.0%)	2(9.5%)	7	4.5
7 - 8	3(4.1%)	3 (5.0%)	2(9.5%)	8	5.1
8 - 10	3(4.1%)	2 (3.3%)	10(47.6%)	15	9.7
10+	10(33.3%)	26(35.1%)	-	36	23.2
Total	74 (100%)	60 (100%)	21 (100%)	155 (100%)	(100%)

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.6 : BREAKDOWN OF NEW PURCHASES OF BUSES 1977 - 1981

Year	(%) Purchase	(%) Growth	(%) Replacement
1981	5.1	3.3	1.8
1980	10.3	0.67	11.0
1979	18.1	6.3	11.8
1978	7.7	5.2	2.5
1977	9.0	1.5	7.5

Source : Urban Transport Study, Johor Bahru, 1981.

The capacity of buses is shown in Table 4.7 below:

TABLE 4.7 : CAPACITY OF BUS FLEET

Capacity	A	B	C	Total	(%)
0 - 10	-	-	-	-	-
10 - 20	2	-	-	2	1.3
20 - 30	-	-	4	4	2.6
30 - 40	-	-	7	9	5.8
40 - 50	31	72	10	113	72.9
50+	25	2	-	27	17.4
Total	74	60	21	155	100.0

Source : Urban Transport Study, Johor Bahru 1981.

TABLE 4.8 : COMPARISON OF AGE OF BUS FLEET : PENANG AND JOHOR BAHRU

Age (Years)	Penang* Island (%)	Province* Wellesley (%)	Johor Bahru** (%)
1 - 2	20.7	27.4	15.4
3 - 4	19.5	23.8	25.8
5 - 6	25.3	16.7	16.1
7 - 10	26.2	16.7	19.3
10+	8.3	15.4	23.2
Total	100.0	100.0	99.8

Source : * Urban Transport Study, Penang 1980.
** Urban Transport Study, Johor Bahru 1981.

3 Employment

The employment in two Companies (B and C) have increased steadily. The employment in Company A decreased between 1972 and 1976 but has since picked up to the 1972 level (Table 4.10).

Besides Company C whose employees are entirely Malay, the percentage of bumiputra employees increased steadily prior to 1976. It is still increasing but at a few percentage points a year only (Table 4.9).

TABLE 4.9 : RACIAL COMPOSITION OF BUS COMPANY EMPLOYEES

Company	Year	Malay	Chinese	Indians	Others	Total
A	1970	18(8%)	194(89%)	7(8%)	-	219
	1971	25(11%)	193(86%)	7(3%)	-	225
	1972	35(15%)	194(82%)	7(3%)	-	236
	1976	66(44%)	72(48%)	12(8%)	-	150
	1977	73(44%)	78(47%)	15(9%)	-	166
	1978	79(44%)	84(47%)	17(9%)	-	180
	1979	99(46%)	91(42%)	26(12%)	-	216
	1980	108(46%)	93(40%)	34(14%)	-	235
B	1970	49(23%)	132(62%)	33(15%)	-	214
	1971	51(23%)	133(62%)	34(15%)	-	218
	1972	55(26%)	126(59%)	34(59%)	-	215
	1976	78(30%)	175(67%)	8(3%)	-	261
	1977	83(32%)	169(64%)	11(4%)	-	263
	1978	87(33%)	166(63%)	9(3%)	-	262
	1979	93(34%)	167(62%)	10(4%)	-	270
	1980	100(38%)	156(59%)	9(3%)	-	265
C	1970	-	-	-	-	-
	1971	34(97%)	1(3%)	-	-	35
	1972	60(98%)	1(2%)	-	-	61
	1976	94(100%)	-	-	-	94
	1977	95(100%)	-	-	-	95
	1978	83(100%)	-	-	-	83
	1979	79(100%)	-	-	-	79
	1980	81(100%)	-	-	-	82

Source : Urban Transport Study, Johor Bahru, 1981

The increase in manpower in Company B has been in line with the expansion of the bus fleet. With Companies A and C, the increase employment has resulted in more employees per bus. In 1980, Company B had the least number of employees per bus (3.78) compared with Company A (3.92) and Company C (4.10). (See Table 4.10).

The working hours and wages of employees of each company is shown in Table 4.11. The salaries of drivers in Company A is 35% higher than for Company B, which is also higher than for Company C by 35%. Bus conductors are higher paid in Company A (25%) than in Company B, which is still 50% more than in Company C (Table 4.11).

TABLE 4.10 : BUS COMPANY EMPLOYMENT
(Figure in Brackets Refer to Number of Employees per Bus)

Company	Year	Driver	Conductor	Main-tenance	Admin-istration	Others	Total
A	76	55(1.20)	59(1.28)		36(.78)		150(3.3)
	77	63(1.37)	65(1.41)		38(.83)		166(3.6)
	78	72(1.5)	68(1.42)		40(.83)		180(3.75)
	79	85(1.47)	90(1.55)		41(.70)		216(3.72)
	80	94(1.56)	98(1.63)		46(.76)		235(3.92)
B	76	96(1.37)	100(1.43)		12(.17)	53(.76)	261(3.73)
	77	94(1.31)	100(1.39)		20(.28)	49(.68)	263(3.65)
	78	95(1.25)	96(1.26)		21(.28)	50(.65)	262(3.45)
	79	97(1.31)	100(1.35)		21(.28)	52(.70)	270(3.65)
	80	94(1.34)	97(1.38)		21(.30)	53(.76)	265(3.78)
C	76	34(2.00)	32(1.88)	10(.59)	15(.88)	3(.18)	94(5.53)
	77	31(1.82)	36(2.12)	10(.59)	15(.88)	3(.18)	95(5.59)
	78	28(1.55)	26(1.44)	9(.50)	17(.94)	3(.17)	83(4.61)
	79	24(1.26)	27(1.42)	9(.47)	16(.84)	3(.16)	79(4.15)
	80	25(1.25)	28(1.40)	9(.45)	17(.85)	3(.15)	82(4.10)

Source : Urban Transport Study, Johor Bahru, 1981

TABLE 4.11 : WORKING HOURS AND WAGES OF BUS WORKERS

	Company	Hours Per Month	Salary Per Month ($)	Salary Per Hours ($)
Driver	A	238	578	$2.43
	B	208	371	$1.78
	C	234	308	$1.32
Conductor	A	238	452	$1.90
	B	208	312	$1.50
	C	234	224	$0.96
Maintenance	A	-	-	-
	B	-	-	-
	C	234	395	$1.68
Admin.	A	208	468	$2.25
	B	192	152	$0.79
	C	208	303	$1.45
Others	A	224	382	$1.71
	B	-	-	-
	C	208	771	$3.71

Source : Urban Transport Study, Johor Bahru 1981

TABLE 4.12 : REVENUE TREND OF SCHEDULED BUS COMPANIES IN JOHOR BAHRU (1976 - 1980) (IN THOUSANDS)
(Figures in brackets refer to rate of growth)

Company	1976	1977	1978	1979	1980	Average Growth (1976-1980)
A	2926.9	3,554.7 (21.5%)	3,730.9 (5.0%)	4,552.9 (22.1%)	5,460.0 (19.9%)	(16.9%)
B	3,999.5	4,508.1 (12.7%)	4,519.3 (0.2%)	5,123.7 (13.4%)	5,753.4 (12.3%)	(9.5%)
C)	794.0	826.2 (4.1%)	864.2 (4.6%)	858.2 (2.4%)	884.3 (-0.1%)	(2.7%);
Total	7,720.4	8,889.0 (15.1%)	9,114.4 (2.5%)	10,561.8 (15.9%)	12,119.7 (14.7%)	

Source : Urban Transport Study, Johor Bahru, 1981

4.2.2 Travel Demand and Bus Revenue

1. Annual Demand and Revenue

The trend of annual scheduled bus revenue is shown in Table 4.12 and Fig. 4.1. There has been a steady growth in revenue by Companies A and B at about 17% and 10% annually except in 1978 when both companies registered a fall. The growth rate of Company C is small and decreasing. In fact, in 1980, there was a slight drop (0.1%).

The growth in passengers carried is shown in Table 4.13.

In terms of passengers carried and revenue, Company B enjoyed **steady** growth of about 13% from 1976 onwards, except in 1978, when a 12% drop in passenger load and 0.2% growth was recorded. Similarly Company B has enjoyed a steady growth rate of about 20% in bus revenue but its passenger load grew at a much lower rate of 5.4% in 1978 and 1979 and 12.4% in 1980. Over the last few years, Company C has been experiencing a decline in passenger load and in 1980 a marginal decline in revenue caused by an 11% drop in passenger load.

The fare increases in October 1978 and on 1st November 1980 appear to have different consequences on different companies. In 1978, Company A experienced a large drop in passenger load (12%) with hardly any increase in revenue. This effect was short-term as within the next year the passenger load lost has been recaptured. With Company B, the effect was to dampen growth but revenue rose 5%. With Company C passenger load dropped 13% but revenue increased 4.6%. However in 1980, the rate of growth of passenger load and revenue was hardly affected. Only in the case of Company C did passenger load decrease but revenue was still maintained.

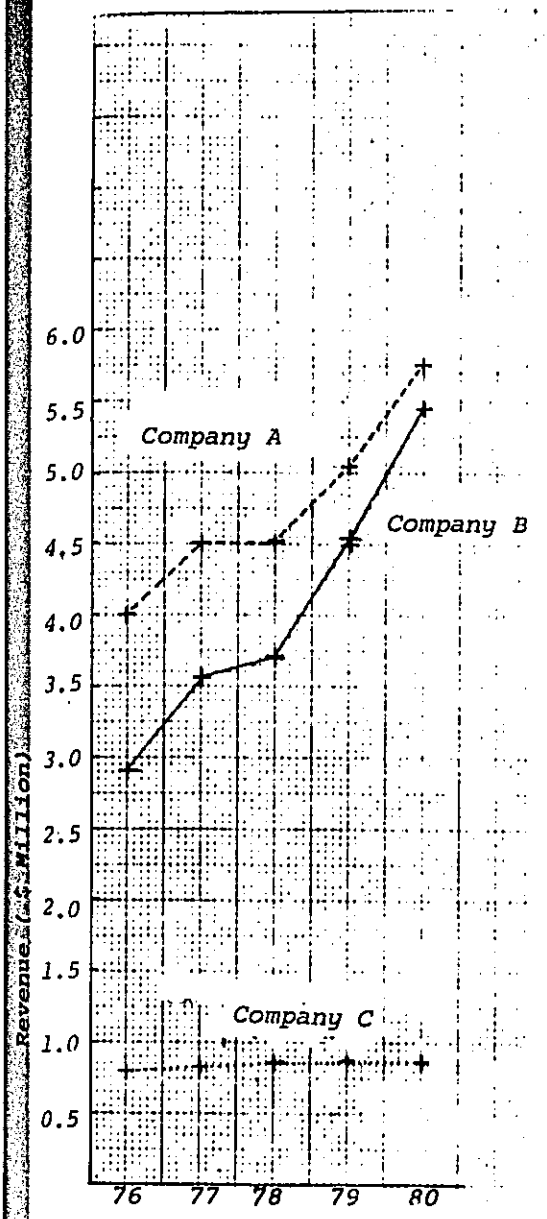
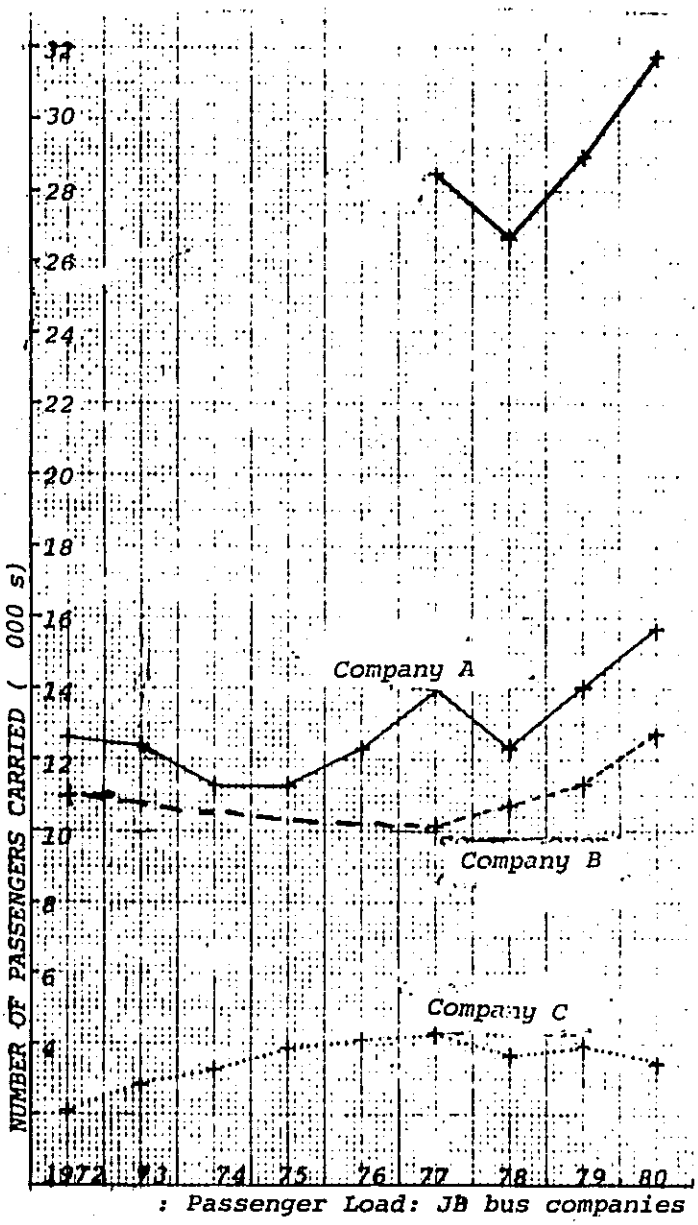
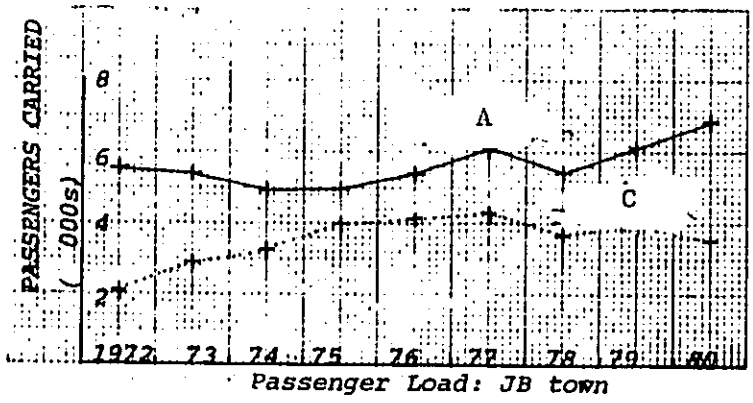


Fig. 4.1 : Operating Revenue
J.B. Bus Companies



: Passenger Load: JB bus companies



Passenger Load: JB town

Fig. 4.2 : Passenger Load : J.B. Bus Companies

TABLE 4.13 : PASSENGER LOAD TRENDS OF SCHEDULED BUS COMPANIES IN JOHOR BAHRU 1972 - 1980

Company	1972	1973	1974	1975	1976	1977	1978	1979	1980
A	12,639.5	12,390.5 (-1.9%)	11,252.2 (-9.2%)	11,240.8 (-0.1%)	12,338.1 (9.8%)	14,008.3 (13.5%)	12,329.1 (-12.0%)	13,983.7 (13.4%)	15,674.4 (12.1%)
B	11,025.5					10,160.3	10,705.9 (5.4%)	11,287.3 (5.4%)	12,688.1 (12.4%)
C	2,097.2	2,889.6 (37.8%)	3,317.6 (14.8%)	3,995.0 (20.4%)	4,133.8 (3.5%)	4,316.6 (4.4%)	3,734.4 (-13.5%)	3,929.7 (5.2%)	3,499.5 (-10.9%)
Total						28,485.3	26,769.3 (-6.0%)	29,200.7 (9.1%)	31,862.0 (9.1%)
Within Johor Bahru A(estimated by company)	5,548.7	5,439.4	4,939.7	4,934.7	5,416.4	6,149.7	5,412.5	6,138.8	6,881.1
B	N O T A V A I L A B L E								
C	2,097.2	2,889.6	3,317.6	3,995.6	4,133.8	4,316.7	3,734.3	3,929.7	3,499.5
Total	N O T A P P L I C A B L E								

Source : Urban Transport Study,Johor Bahru, 1981

2. Monthly Demand and Revenue

Monthly bus travel demand expressed in revenue collected by bus campanies in 1980 is shown in Fig. 4.3. Total revenue appears to be on an average of about $1 million per month before the fare increase. Travel demand appears to increase during the months of April and August. This may be due to the increase in trips by school children who are on holidays. Revenue in October, November and December appears to be increasingly high. This may be due to the aforesaid reason and also the fare increase imposed in October of that year.

3. Daily Demand and Revenue

Daily demand and revenue fluctuations are shown in Figs. 4.4 to 4.6 for the months of March, July and December. Several norms are distinguishable.

(a) Bus travel demand appears to peak on weekends, usually Sundays

Most of the peaks generated revenue between 35 and 40 thousand dollars a day in March and July 1980 and 50 to 55 thousand dollars per day in December of the same year.

(b) Bus travel demand appears to be least on Tuesdays and Wednesdays. In March and July 1980, these troughs generated about 25-30 thousand dollars per day and 35-40 thousand in December 1980.

4. Daily Fluctuation

Daily fluctuation in bus passenger volume is indicated by passenger movements in the bus-stops in town. Two bus-stands in the town centre at Jalan Ah Fook and Jalan Tun Razak were selected for 16 hours counts from 7am to 11pm. The results are shown in Fig. 4.7.

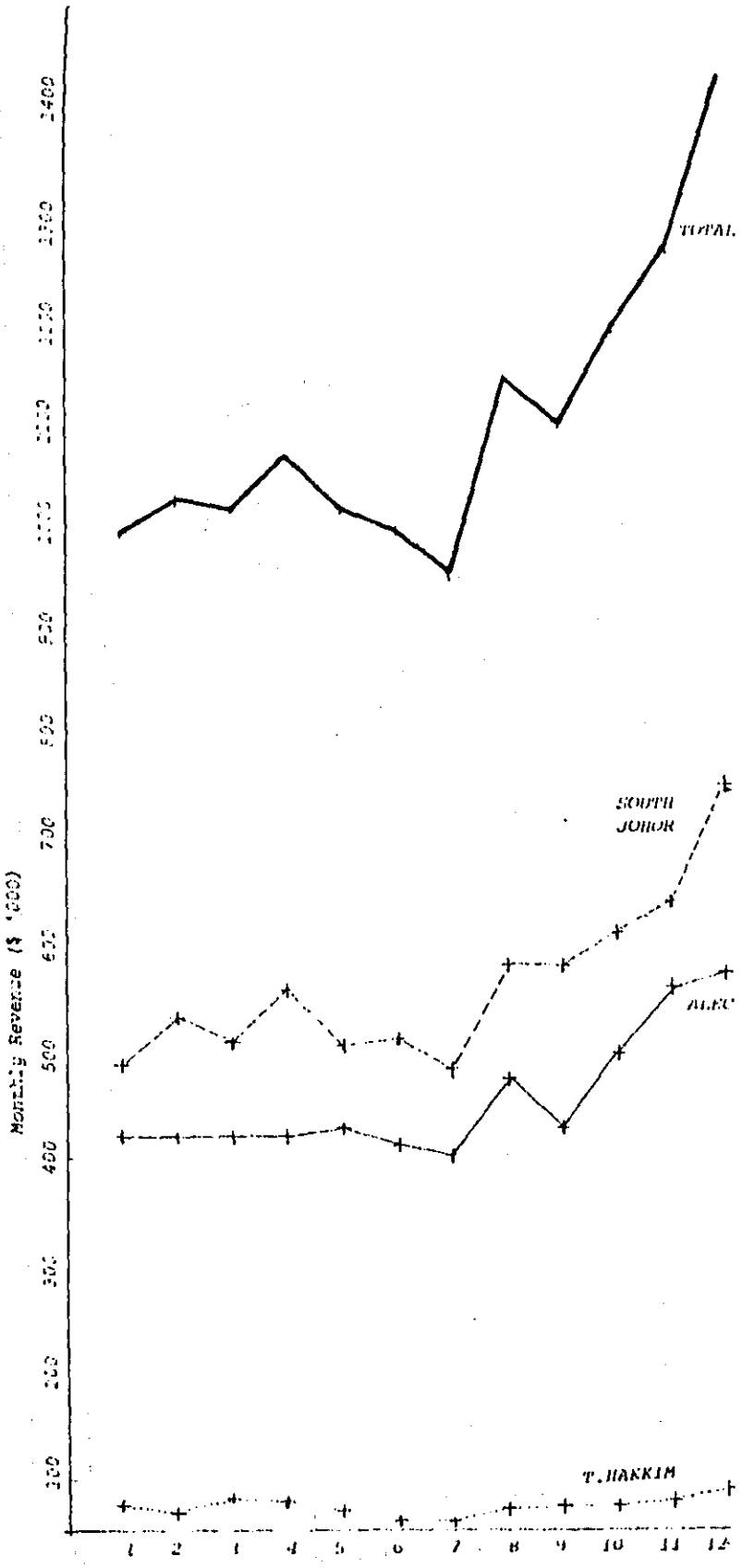


Fig. 4.3 : Monthly Bus Volume, 19..

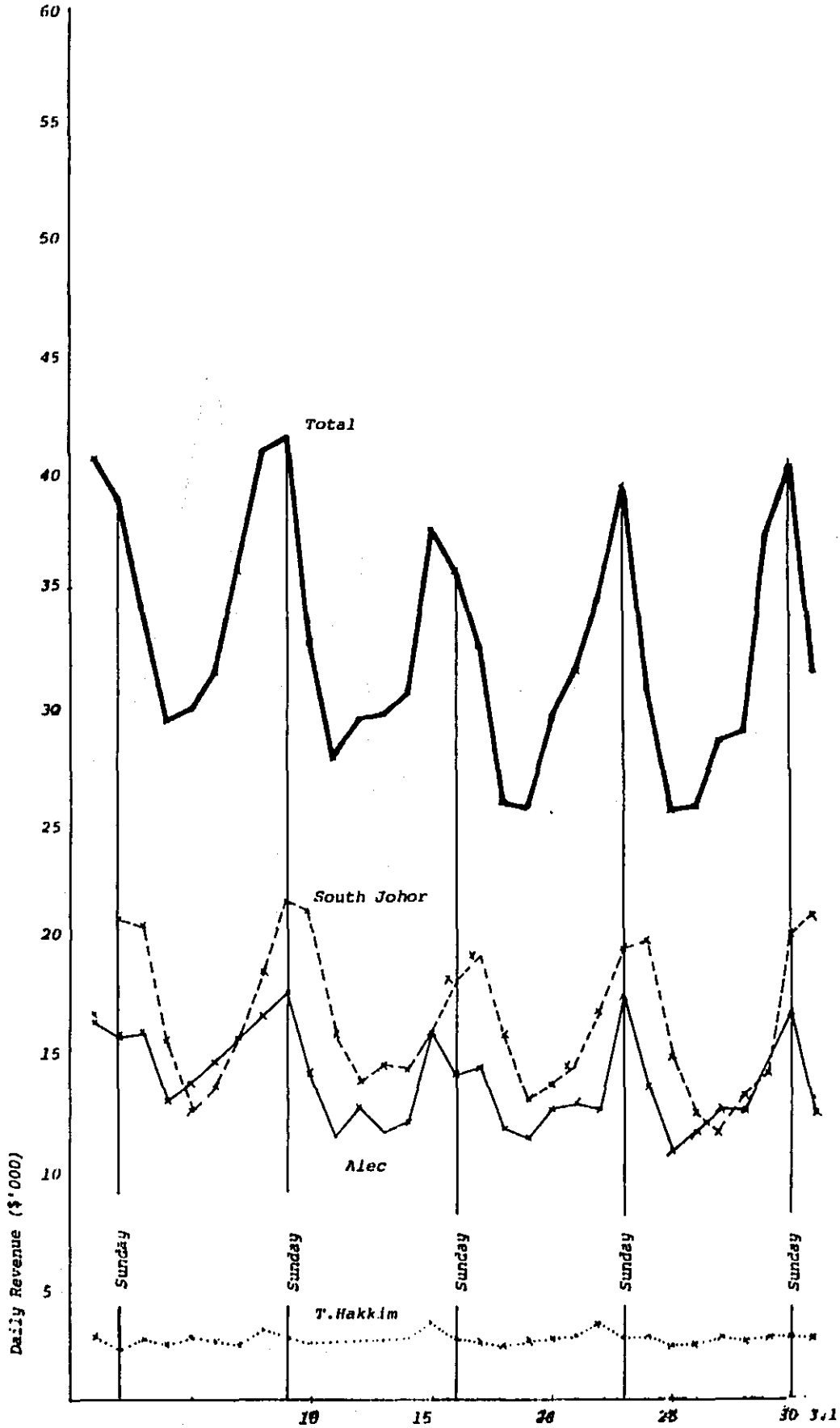


Fig. 4.4 : Daily Bus Operating Revenue, Bus Companies in Johor Bahru March 1980

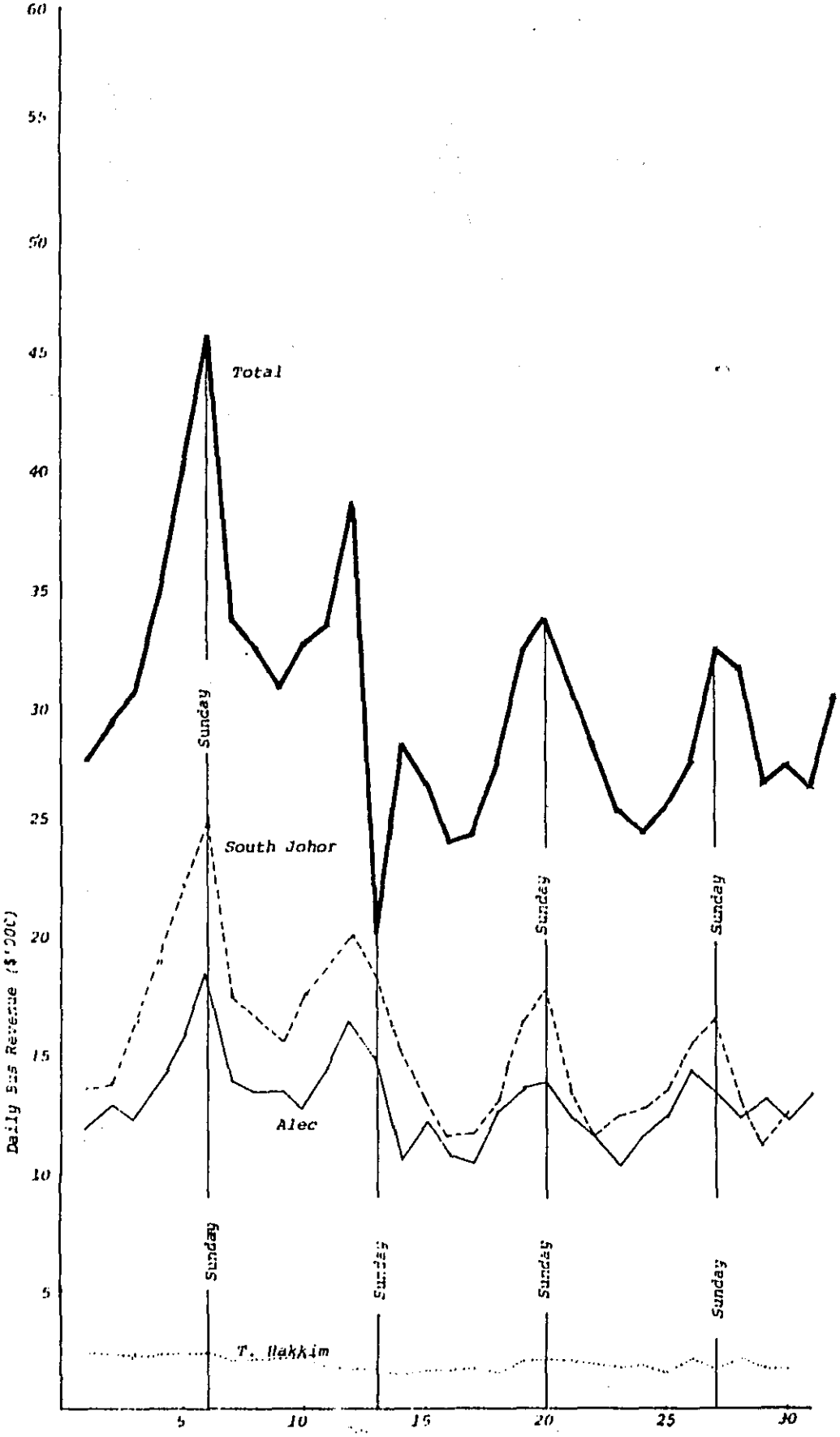


Fig. 4.5 : Daily Bus Operating Revenue, Bus Companies in Johor Bahru July 1980

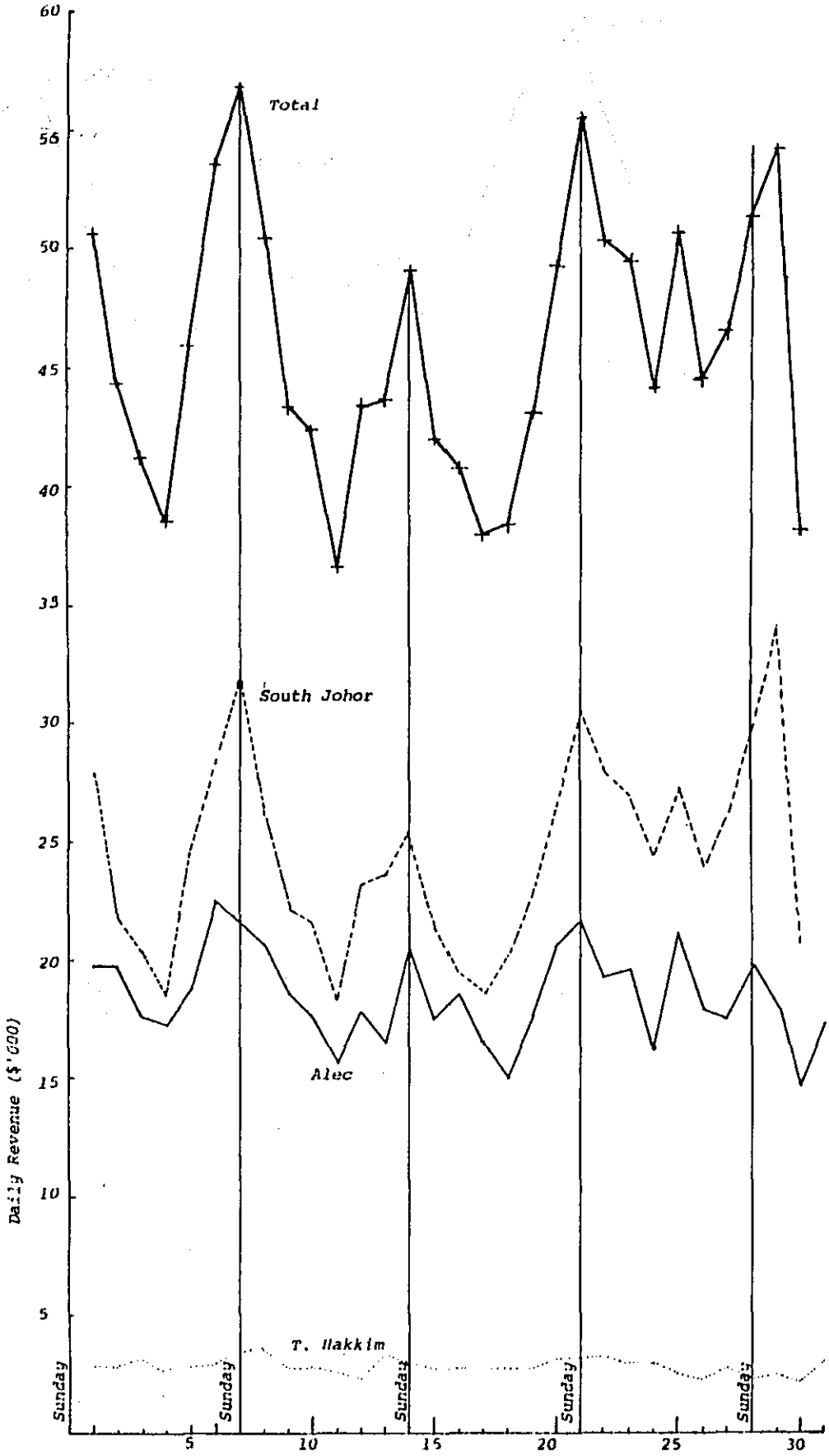
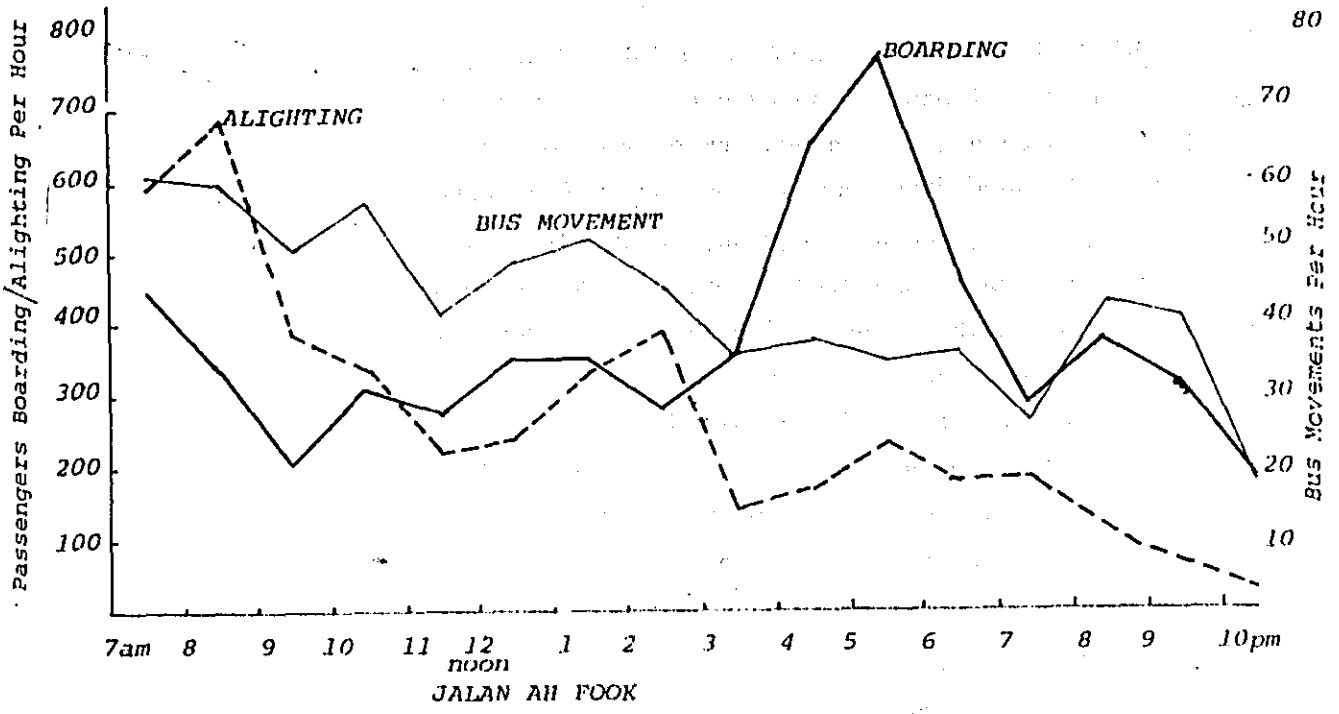


Fig. 4.6 : *Daily Bus Operating Revenue, Bus Companies In Johor Bahru Dec 1980.*



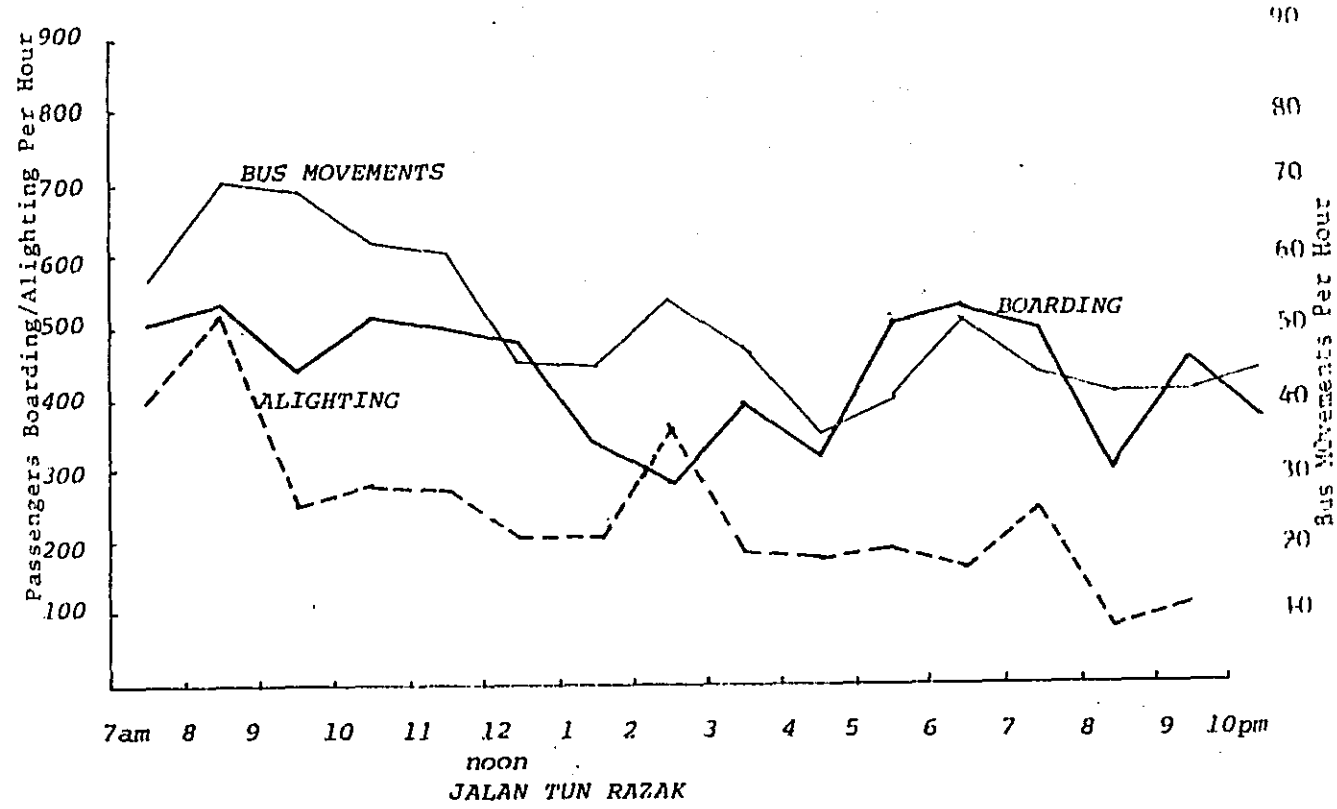


Fig. 4.7 : Daily Passenger and Bus Movements.

At the Jalan Ah Fook bus-stand, alighting passengers peaked between 7am and 10am with the peak hour from 8am to 9am and boarding passengers peaked between 4pm and 7pm with the peak hour from 5am 6 pm. The Jalan Tun Razak bus-stand evinces a similar pattern except that the peaks are flattened ie, passengers alighting and boarding are spread over a wider period of time. This may perhaps be explained the fact that the Tun Razak station is closer to the market and shopping centre , where punctuality is of no importance as opposed to Jalan Ah Fook where there is expected to be a higher percentage of passengers going to and from work.

In both stations, there appear a peak in alighting passengers between 2pm and 3pm. Another peak in alighting passengers occurs in the Jalan Tun Razak station between 7pm and 8pm.

However bus services appear to be regular without any change in frequency to meet peak hour traffic. Even worse, Fig. 4.7 indicates that the number of bus movements may actually decrease when there is an increase in demand. This probably arises when buses are fully loaded and have to by-pass some stations.

TABLE 4.14 : BUS AND PASSENGER MOVEMENTS, JALAN AH FOOK BUS-STAND

Jalan Ah Fook	Total Boarding	Total Alighting	Bus Movements
7 - 8 am	453	579	60
8 - 9 "	339	693	59
9 - 10 "	213	371	50
10 - 11 "	308	326	56
11 - 12 noon	287	213	41
12 - 1 pm	354	234	49
1 - 2 "	351	340	51
2 - 3 "	289	383	45
3 - 4 "	352	144	35
4 - 5 "	645	171	37
5 - 6 "	773	232	35
6 - 7 "	470	184	36
7 - 8 "	291	190	31
8 - 9 "	390	121	44
9 - 10 "	329	58	42
10 - 11 "	195	33	18
Total	6039	4272	689
Jalan Tun Razak	**Total Boarding**	**Total Alighting**	**Bus Movements**
7 - 8 am	505	407	56
8 - 9 "	533	534	70
9 - 10 "	440	246	68
10 - 11 "	506	269	61
11 - 12 noon	500	260	60
12 - 1 pm	487	200	46
1 - 2 "	329	201	44
2 - 3 "	285	363	54
3 - 4 "	598	188	48
4 - 5 "	315	172	35
5 - 6 "	504	178	41
6 - 7 "	517	162	51
7 - 8 "	499	233	44
8 - 9 "	297	86	41
9 - 10 "	450	95	42
10 - 11 "	375	33	44
Total	7,140	3627	805

Source : Urban Transport Study, Johor Bahru, 1981

4.2.3 Level of Bus Service

1. Route Network and Service Frequency

There are 27 bus routes in operation within and out of Johor Bahru (Fig. 4.8). Another two are approved but not yet in operation. Of the 27, some 7 routes ply between Johor Bahru and regional and rural towns (Pontian, Kulai, Air Hitam, Kota Tinggi, Gelang Patah and Masai) Fig. 4.9 shows the feeder bus services operated out of the regional towns of Pontian, Kota Tinggi and Kulai. These feeder services serve estates and rural villages, linking them to the regional towns. Passenger load on routes, where available, are shown in Table 4.15.

Bus frequency within the city limits is shown in the same Table and Fig. 4.10. It can be seen that most of the older residential areas are well-served by bus services in terms of route and frequency. However the network has not caught up with the development of new housing estates. In particular, the area to the east of Jalan Tebrau and bounded by Jalan Pasir Pelangi and Jalan Bakar Batu are not penetrated by bus-routes.

2. Bus-Stop Coverage

The location of existing bus-stops and bus-stands is shown in Fig. 4.11. Assuming a maximum convenient walking time of 10 minutes or an equivalent distance of 150 metres, several areas are apparently insufficiently covered. Most prominent is the area not penetrated by bus routes, viz bounded by Jalan Tebrau, Jalan Pasir Pelangi and Jalan Bakar Batu. Other areas include Taman Tasek and Taman Majidee.

TABLE 4.15, : BUS SERVICES, FREQUENCY AND ANNUAL PASSENGER LOAD, MPJB

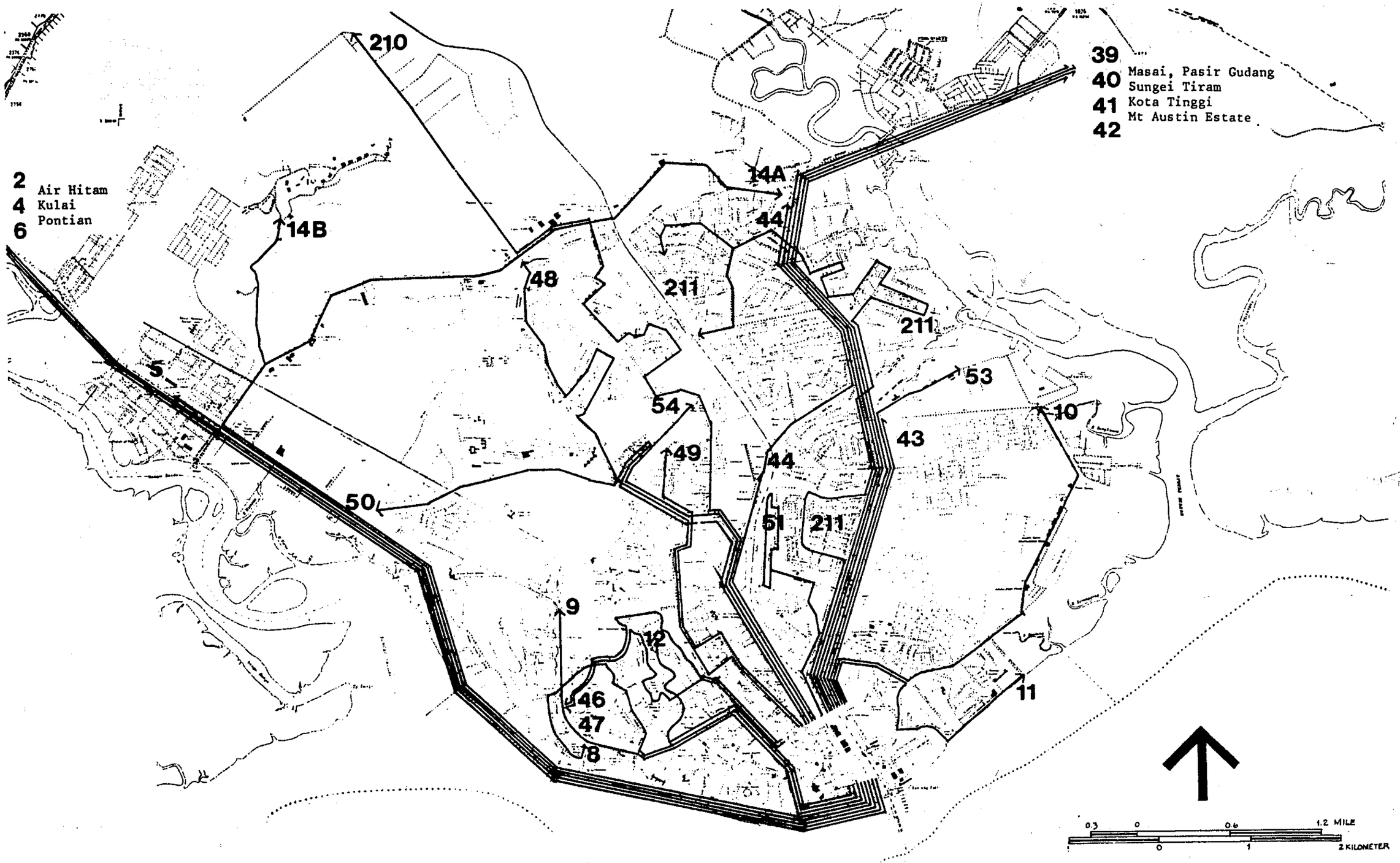
Company	Route Number	Origin - Destination	Distance mile (Km)	Frequency in one direction		Passengers carried ('000)	
				Peak 7 - 8 am	Whole day	1979	1980
Alec		J.B. - Pasir Gudang /Masai	20 (32)	4	75	3,533.7	
"	40	" - Sungai Tiram	20 (32)	1	8	296.5	
"	41	" - Kota Tinggi	26 (41.6)	4	72	3,707.1	
"	42	" - Pandan, Mt. Austin Estate	8.35(13.2)	5	92	1,401.2	2,006.3
"	44	" - Kangkar Tebrau	8 (12.8)	6	105	1,789.9	
"	45	" - Junction Jalan Bakar Batu	3 (4.8)	-	-	NOT IN OPERATION	
"	46	" - Junction Water-work via Tarom	3.6 (5.76)	1	18	180.4	202.2
"	47	" - Nong Chik via Yusof Taha	3.6 (5.76)	1	18	NOT AVAILABLE	
"	48	" - Ungku Mohsin via Yahya Awal	6 (9.6)	5	90	11,954.9	2,191.3
"	49	" - Customs Quarter via Yahya Awal	4.3 (6.9)	1	18	NOT AVAILABLE	
"	50	" - Junction Scudai via Larkin	5 (8.0)	1	14	INCLUDING ROUTE 54 275.5	308.8
"	51	" - Century Garden via Wadi Hana	4.2 (6.7)	2	36	225.1	252.4
"	52	" - Jalan Tampoi via Jalan Pandan	5 (8)	-	-	NOT AVAILABLE	
"	53	" - Majidi Barracks	4 (6.4)	1	17	114.7	128.5
"	54	" - Kg. Baru Tampoi via Jalan Sentosa	6 (9.6)	1	17	SEE ROUTE 50	
South Johor	2	" - Air Hitam	58 (93)	4	54	Not available	
"	4	" - Kulai	20 (32)	2	35	"	
"	5	" - Jalan Scudai	6.5 (10.4)	1	36	"	
	6	" - Pontian	37 (59.2)	4	68	"	
	8	" - Jalan Kolam	3.4 (5.4)	1	42	"	
	9	" - Jalan Kolam Air via Air Molek	4.4 (7.0)	6	70	"	
"	10	" - Sek. Bakar Batu via Pelangi	4.5 (7.2)	6	71	"	
"	11	" - Stulang Darat	3.1 (5.0)	2	34	"	
"	12	" - Kolam Air	4.7 (7.5)	2	34	"	
"	14A	" - Kg. Melayu	10 (16)	1	15	"	
"	14B	" - Tampoi	10 (16)	2	27	"	
"	15	" - Gelang Patah	21 (33.6)	2	32	"	
T. Hakkim	210	" - Kg. Baru Kempas	8.8 (14.0)	5	90	1,768.4	1,574.8
	211	" - Kg. Majidi Baru via Century Garden	8.1 (12.6)	5	90	2,161.3	1.924.7
Maju	208	" - Masai	20 (32)	3	7		

Source: Urban Transport Study, Johor Bahru, 1981.

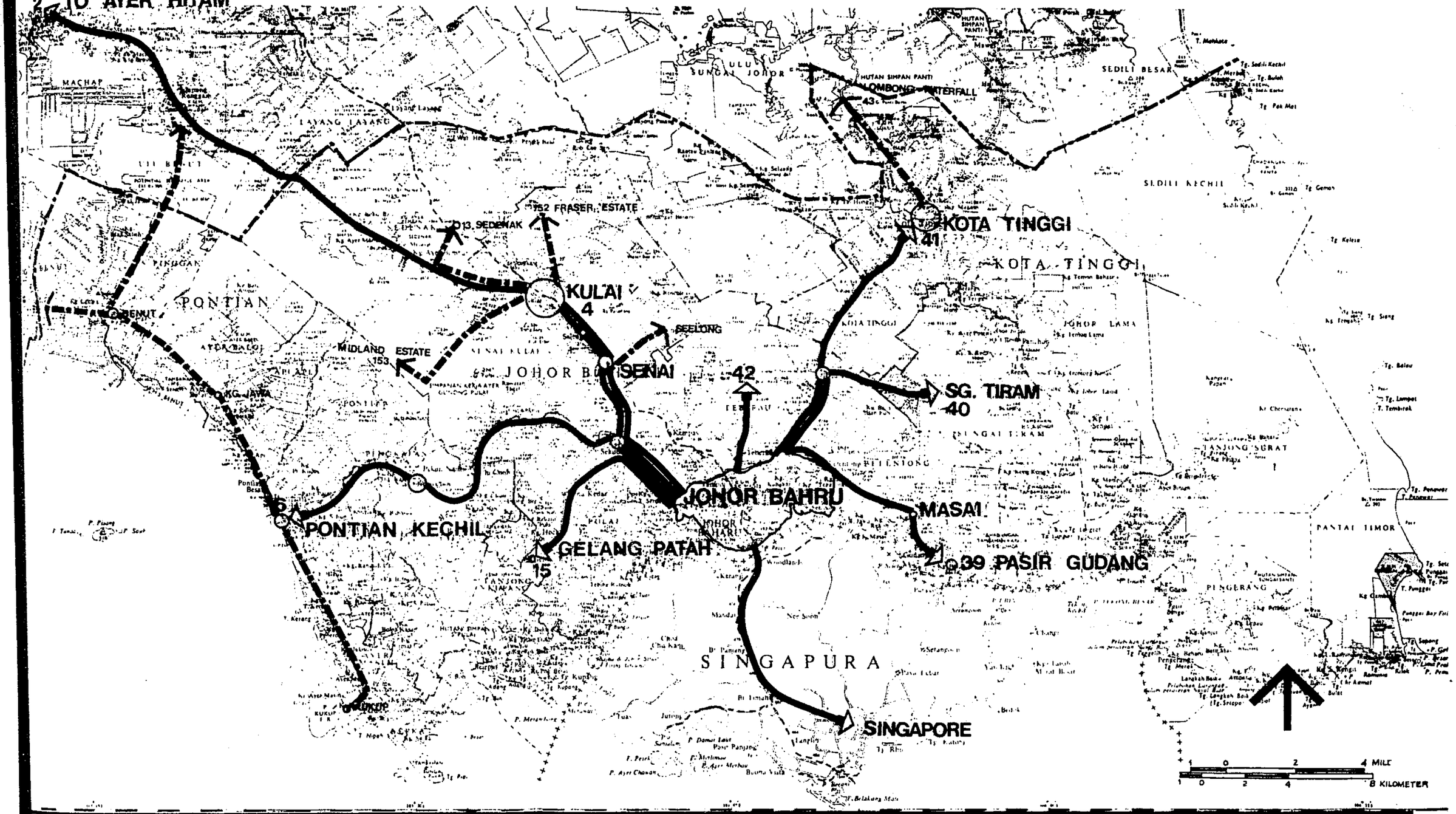
TABLE 4.16 : BUS ROUTES, FREQUENCY AND ANNUAL PASSENGER LOAD, STUDY AREA.

Company	Route Number	Origin - Destination	Distance mile (Km)	Frequency in one direction		Passengers carried ('000)	
				Peak 7 - 8	Whole day	1979	1980
Alec	43	Kota Tinggi - Lombong Waterfall	10 (16)	1	10	302.0	
S.J.	7	" - Swee Lam Estate	7.0 (11.2)	1	8		
"	13	" - Sedenak Estate	15.0 (24.0)	3	17		
Kulai Tai Hin	152	" - Sengkang	3.5 (5.6)	1	14		
"	152	" - Fraser Estate	8 (3.2)	1	14		
"	153	" - Midland Estate	10 (16)	1	14		
"	153	" - Kulai Young	8.5 (13.6)	1	14		
New Seelong	-	Senai - Seelong	6.75(10.8)	1	14	34.9	34.7

Source : Urban Transport Study, Johor Bahru, 1981.



URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION. MALAYSIA.	LEGEND: —— Bus Routes → 8 End of Route with route number	TITLE: **BUS ROUTES in JOHOR BAHRU**	MAP NO. Fig. 4.8



URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

POPULATION 1980

20,000
10,000

BUS – ROUTES

ROUTES TO/FROM JOHOR BAHRU

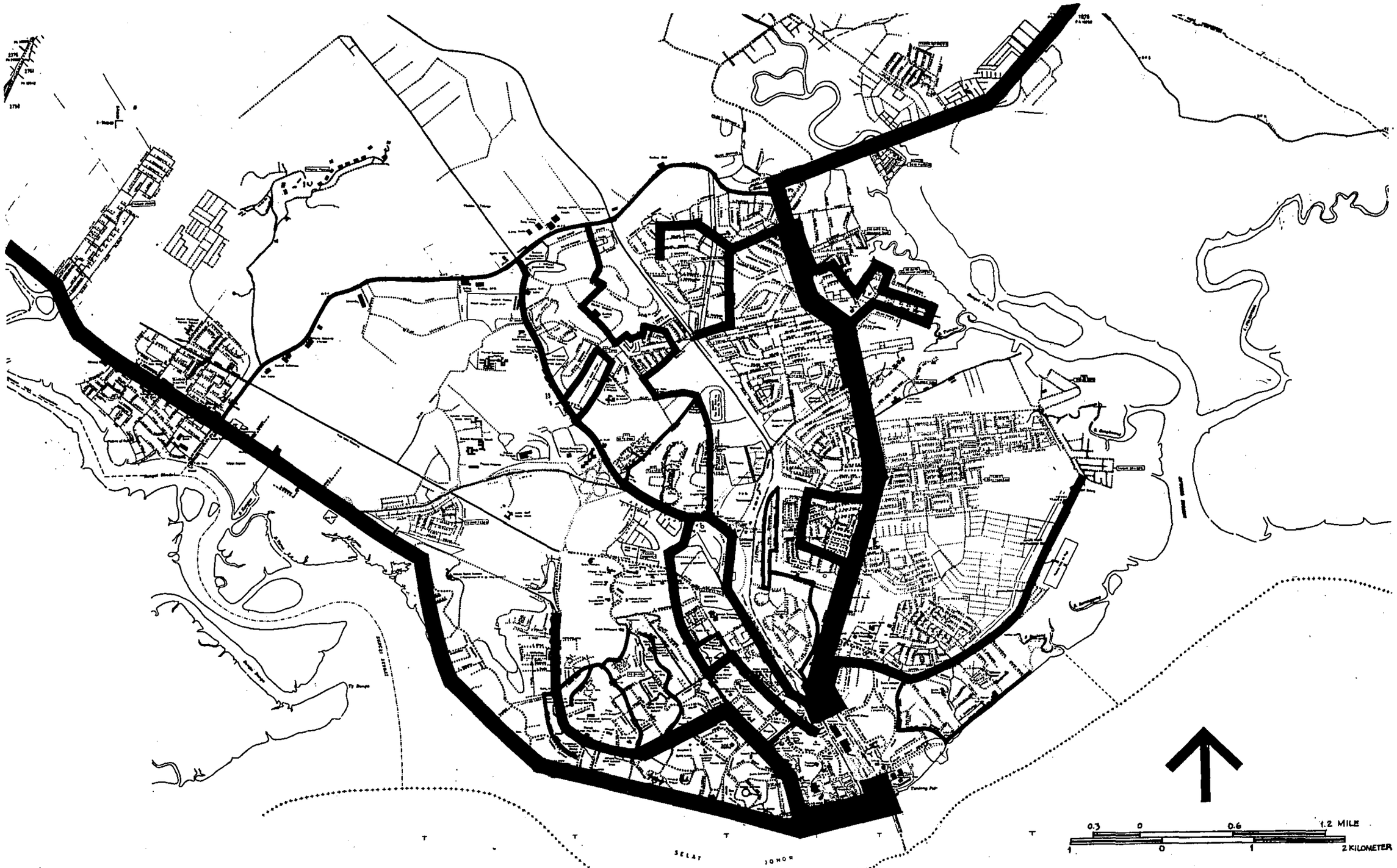
ROUTES TO/FROM OTHER TOWNS

TITLE:

REGIONAL SCHEDULED BUS SERVICES 1981.

MAP NO.

Fig. 4.9



URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

1 TRIP PER HOUR
2 TRIP
3 TRIP
4 TRIP
6 TRIP

30 25 20 15 10 5

TITLE:

SCHEDULED BUS FREQUENCY

MAP NO.

FIG 4-10

URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- Bus-stop
- Bus-stand
- Catchment area of bus-stop and bus-stand. (radius 150m.)

TITLE:

BUS-STOP AND BUS-STAND COVERAGE IN MPJB AREA.

MAP NO.

FIG. 4.11

3. Travel Time

Travel time by bus on selected routes within the MPJB area is shown in Fig. 4.12. Travel time outside the MPJB area is shown in Fig. 4.13. It can be deduced generally that the travel speed is higher on rural roads (average 30 mph) than on suburban roads (10 - 25 mph) which is in turn higher than in the Central Business District (5 - 10 mph). (Table 9.17). There are several a sections along bus routes which delay buses.

Within the CBD, there are 3 main areas of congestion : (See Fig. 4.14).

(a) At Jalan Station

In crossing from Jalan Ah Fook into Jalan Station, buses have to wait to cross a traffic lane at one end and there is a traffic light at the other.

(b) At Jalan Tun Razak near Immigration Complex

One lane is blocked by traffic turning into Jalan Siu Nam while the queue from the Immigration Complex sometimes continues beyond this point, thus blocking the whole passage.

(c) At Jalan Ibrahim

Buses to the central and eastern sector have to turn back into Jalan Ah Fook from Jalan Selat Tebrau via Jalan Ibrahim which is very narrow.

On a number of routes, buses have to go along Jalan Tun Razak - Jalan Selat Tebrau - Jalan Ibrahim - Jalan Ah Fook - Jalan Station and again to Jalan Tun Razak and Jalan Selat Tebrau. (See Fig. 4.14). This repeated stretch adds to the travel time and decreases travel speed because of congestion at the points mentioned above.

Along the suburbs, congestion occurs in the following places.

(d) Jalan Tebrau

Because of its central alignment, Jalan Tebrau is heavily trafficked and congestion arises as the road is narrow.

(e) Jalan Kebun Teh

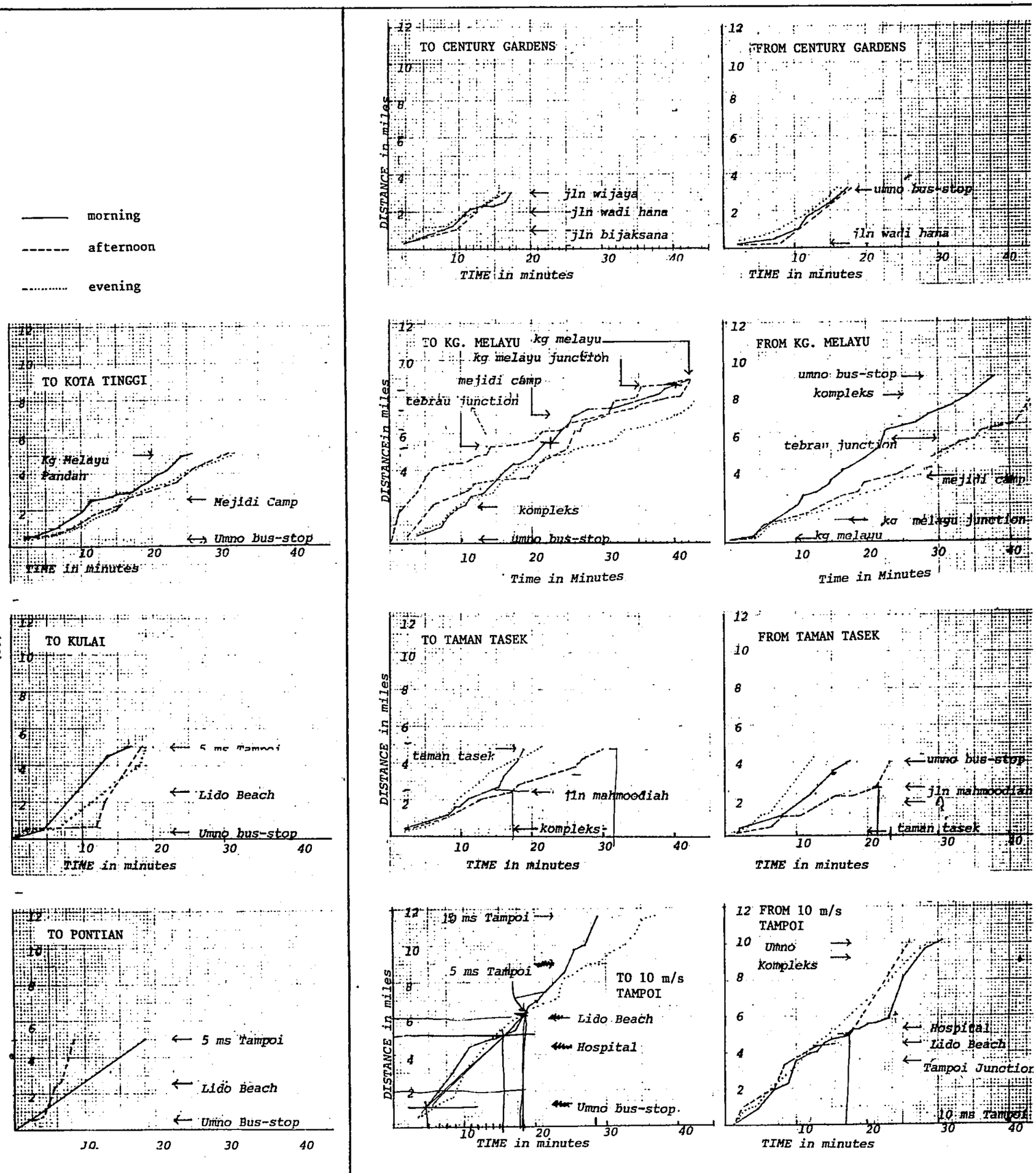
This stretch is narrow and congested, particularly at the junction with Jalan Tun Razak - Jalan Larkin.

The travel speed along selected road sections are shown in Table 4.17.

TABLE 17 : BUS TRAVEL SPEED IN SELECTED ROAD SECTIONS

ection	From Town Centre		To Town Centre	
	(mph)	(km/hr)	(mph)	(km/hr)
mno bus-stop to MPJB bus-stop	9.5	15.2	10.0	16.0
mno bus-stop to Police Depot	7.5	12.0	5.0	8.0
alan Tebrau (From Interchange to Pandan)	9.0	14.4	9.0	14.4
alan Kolam Air	6.5	10.4	10.7	17.1
alan Scudai (Causeway to Tampoi)	22.5	36.0	23.0	36.8
alan Tampoi	30.0	48.0	17.6	28.2
ampoi Junction/Kulai	30.0	48.0	30.00	48.0
ampoi Junction/Pontain	29.1	46.6	25.6	41.0
andan/Ulu Tiram	17.0	27.2	17.4	27.8
lu Tiram/Kota Tinggi	30.0	48.0	30.0	48.0

Source : Urban Transport Study, Johor Bahru 1981.



INTERURBAN TRIPS: Portion within MPJP

URBAN TRIPS: Outward Bound

URBAN TRIPS: Return Trip.

Fig. 4.12 : Bus Travel Time Within MPJP

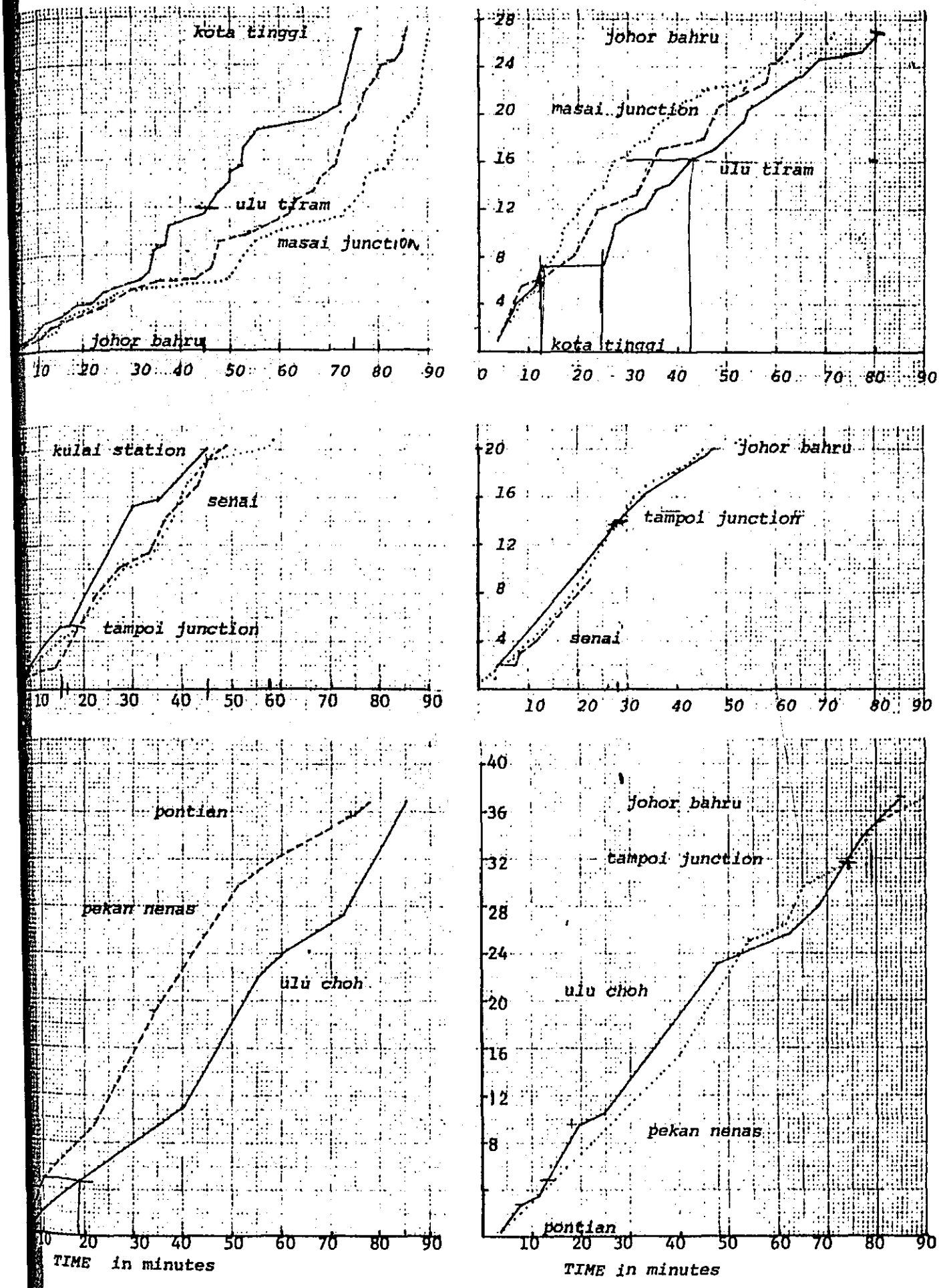
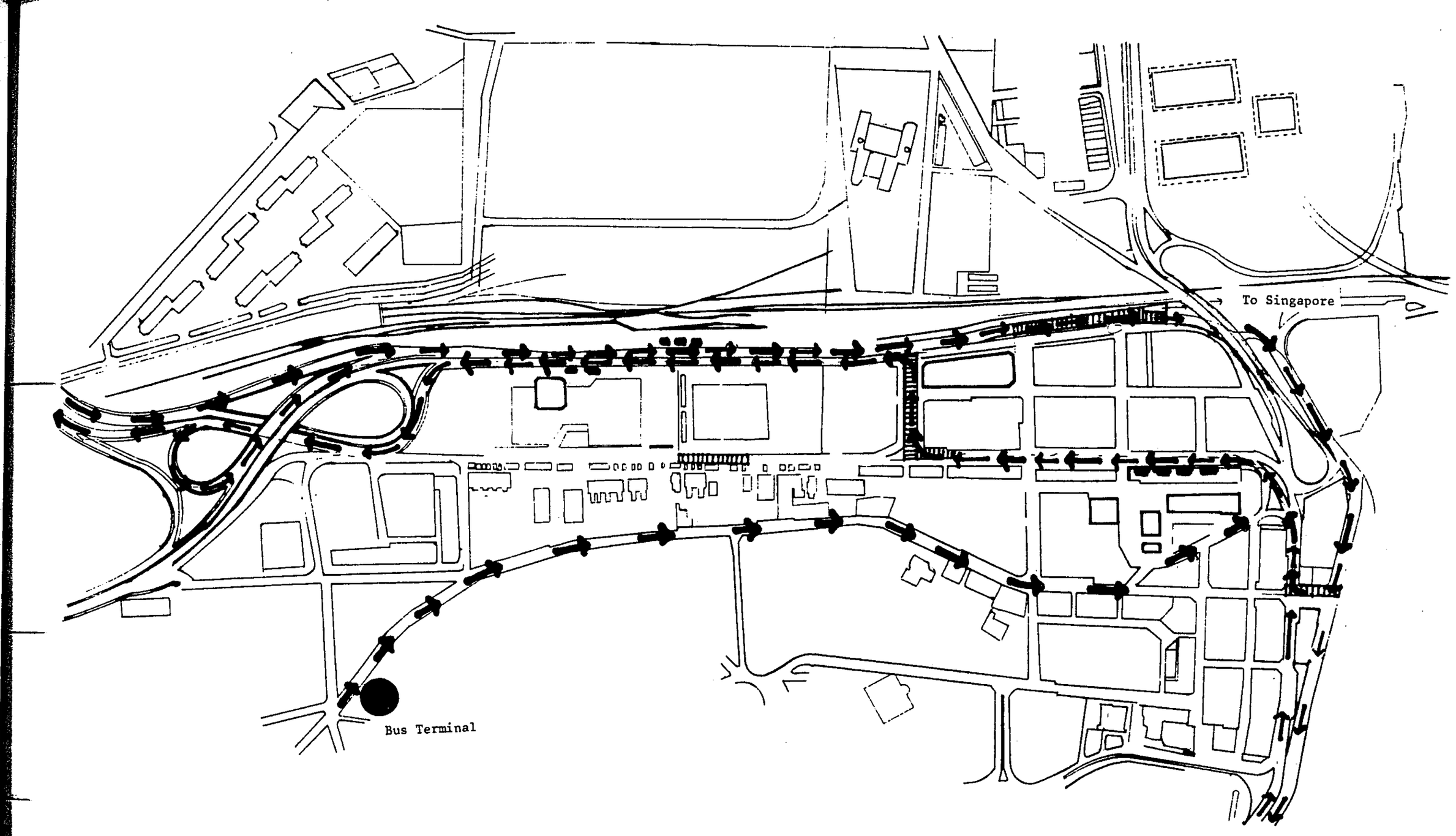


Fig. 4.13 : Bus Travel Time Outside MPJB area.



URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- To Jalan Tebrau and Kota Tinggi
- To west, Pontian and Kulai
- From Bus Terminal
- Bus-stand
- Congested Areas

TITLE: CONGESTION ALONG BUS ROUTES IN CBD

MAP NO.

FIG. 4.14

4. Passsenger Load Factors

Passenger loads on selected routes are shown in Figs. 4.15 to 4.20. The average and maximum load factors are tabulated in Tables 4.18 and 4.19.

Passenger loads tend to be higher towards the town centre in the mornings and from the town centre in evenings. This corresponds to the pattern of workers who go to work in the town centre and return home in the evenings.

It can also be discerned that outstation bus-trips to Pontian, Kulai and Kota Tinggi also serve traffic within the municipality. In fact, load factors are significantly higher and the survey results show cases of overloading.

Overloading indicated by load factors greater than one, appear on several routes. It appears to be worst along the trunk routes along Jalan Scudai to the town centre and along Tebrau. The average load factor along Jalan Tebrau (on Route 41) to Kota Tinggi) appears to be 1.32 in the morning and 1.45 in the morning and evenings respectively. The average load factor along Jalan Scudai (from Causeway) is about 0.68 in the morning but 1.16 in the evenings). Overloading also occurs in the route from Kolam Air in the morning and to Kolam Air in the evening. Overloading to and from Kolam Air in the afternoon is caused by school children going to and from school. There thus appears to be overloading on several sectors. It indicates an insufficiency in the supply of bus services.

It can also be discerned that in general that loads to the town centre are less than from it. It is observed that on the trip to town, bus services face competition from legal and private taxis which both operate share-ride services and thus the fare

is competitive with buses. On the return trip however, this practice is curtailed as passengers have to share the same or near destinations for the share-ride service to work.

TABLE 4.18 : AVERAGE PEAK HOUR PASSENGER LOAD FACTORS

Place	To Place			From Place		
	Morning	Noon	Evening	Morning	Noon	Evening
Century Garden	0.51	0.29	0.58	0.33	0.10	0.14
Kolam Air	0.42	0.72	0.85	0.68	0.10	0.87
Kg. Melayu	0.20	0.31	0.10	0.47	0.27	0.39
Tampoi	0.77	0.69	0.78	0.36	-	0.20
Pontian	0.64	0.85	-	-	-	-
Kulai	0.22	0.35	0.60	0.45	0.20	0.37
Kota Tinggi	0.81	0.66	0.75	0.45	0.75	0.45

Source : Urban Transport Study, Johor Bahru, 1981

TABLE 4.19 : MAXIMUM PASSENGER LOAD FACTORS DURING PEAK HOURS

Place	To Place			From Place		
	Morning	Noon	Evening	Morning	Noon	Evening
Century Garden	0.90	0.27	1.00	0.77	0.23	0.89
Kolam Air	0.57	1.09	1.07	1.14	1.23	0.23
Kg. Melayu	0.35	0.50	0.75	0.75	0.45	0.79
Tampoi	0.82	1.07	1.20	0.57	-	0.41
Pontian	0.84	1.0	-	-	-	-
Kulai	0.45	0.66	1.00	0.73	0.36	0.64
Kota Tinggi	1.45	0.91	1.61	0.73	1.32	0.64

Source : Urban Transport Study, Johor Bahru, 1981

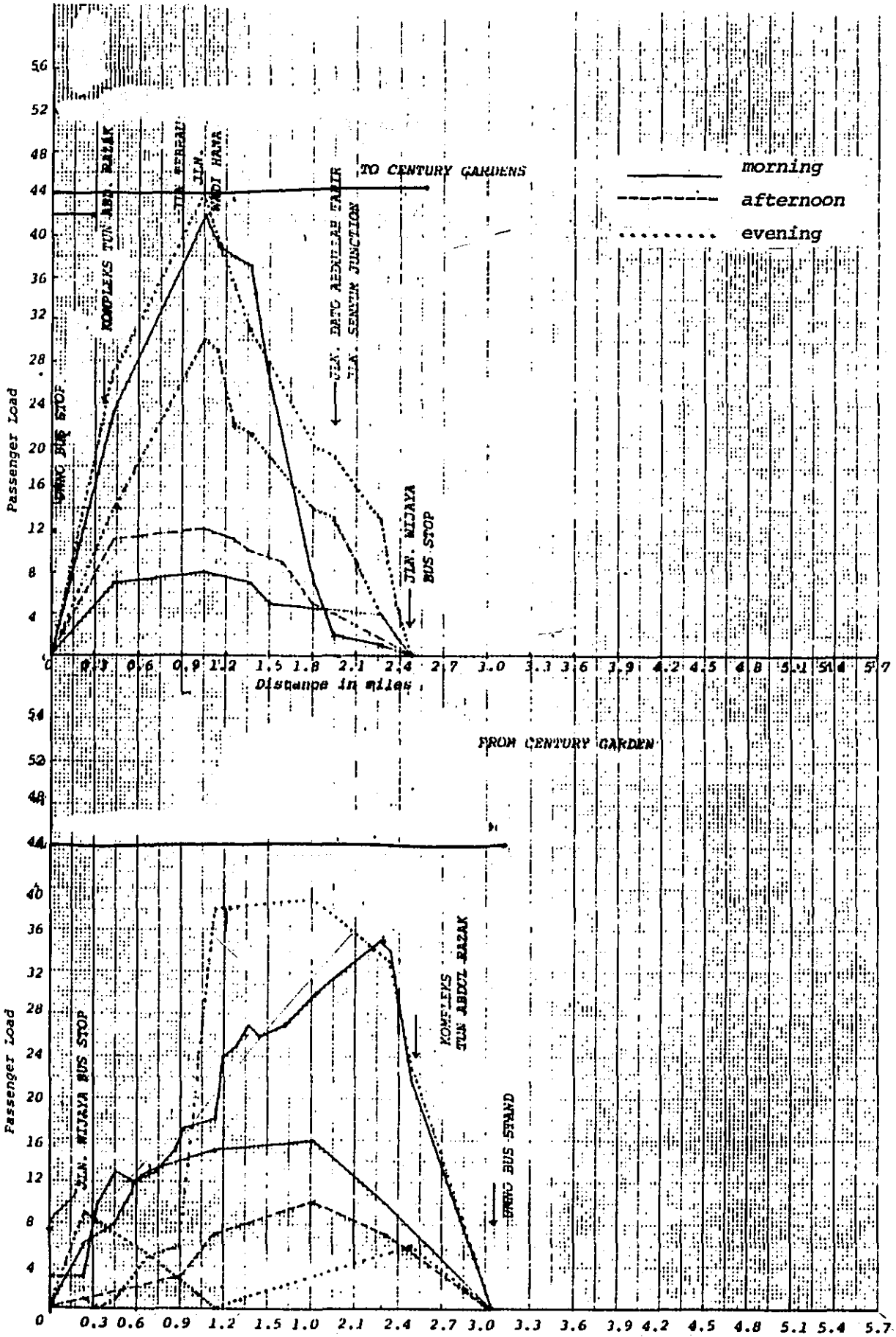


Fig. 4.15 : Distance in miles
Passenger Load : Route 51 to Century Garden

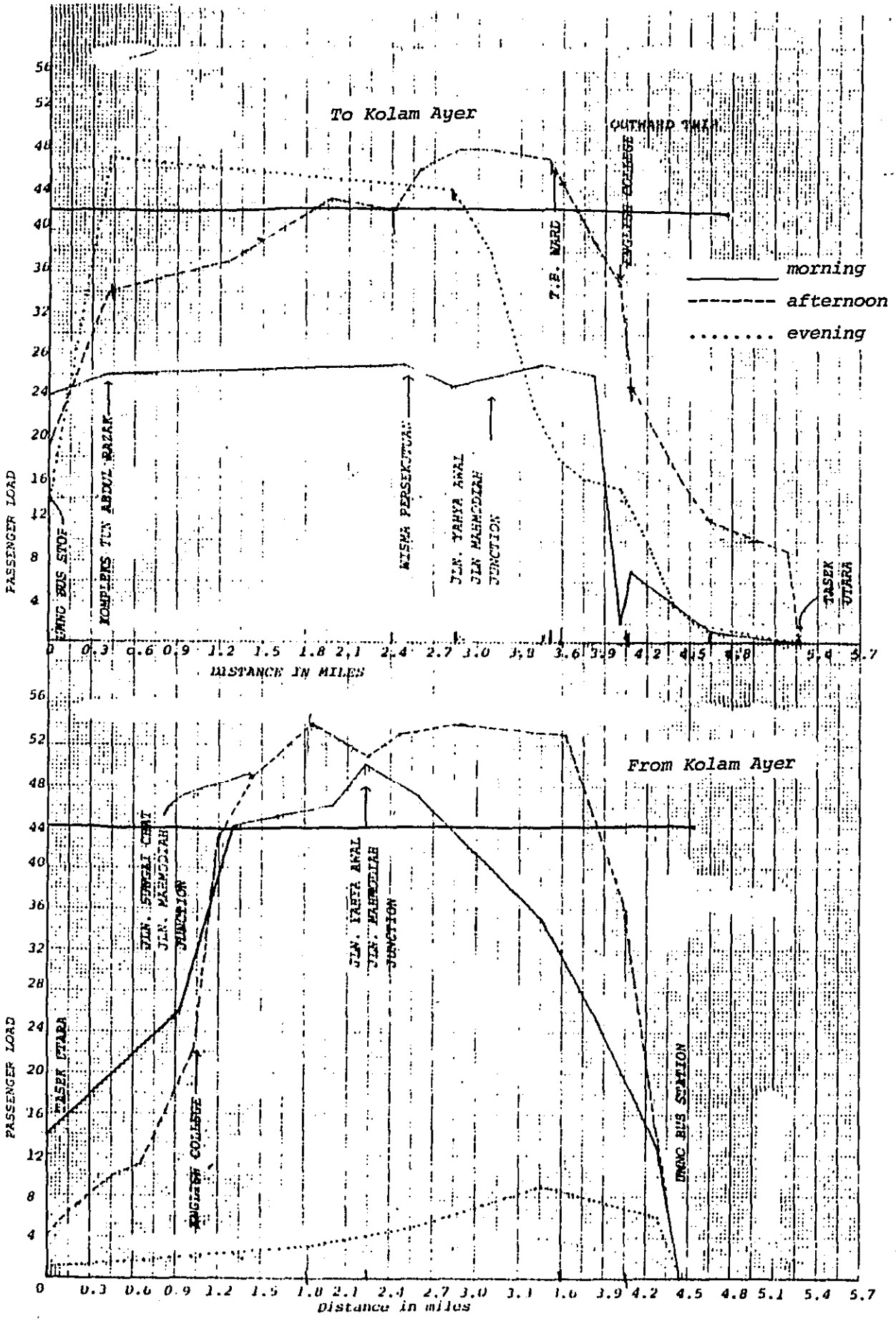


Fig. 4.16 : Passenger Load : Route 46 to Kolam Ayer.

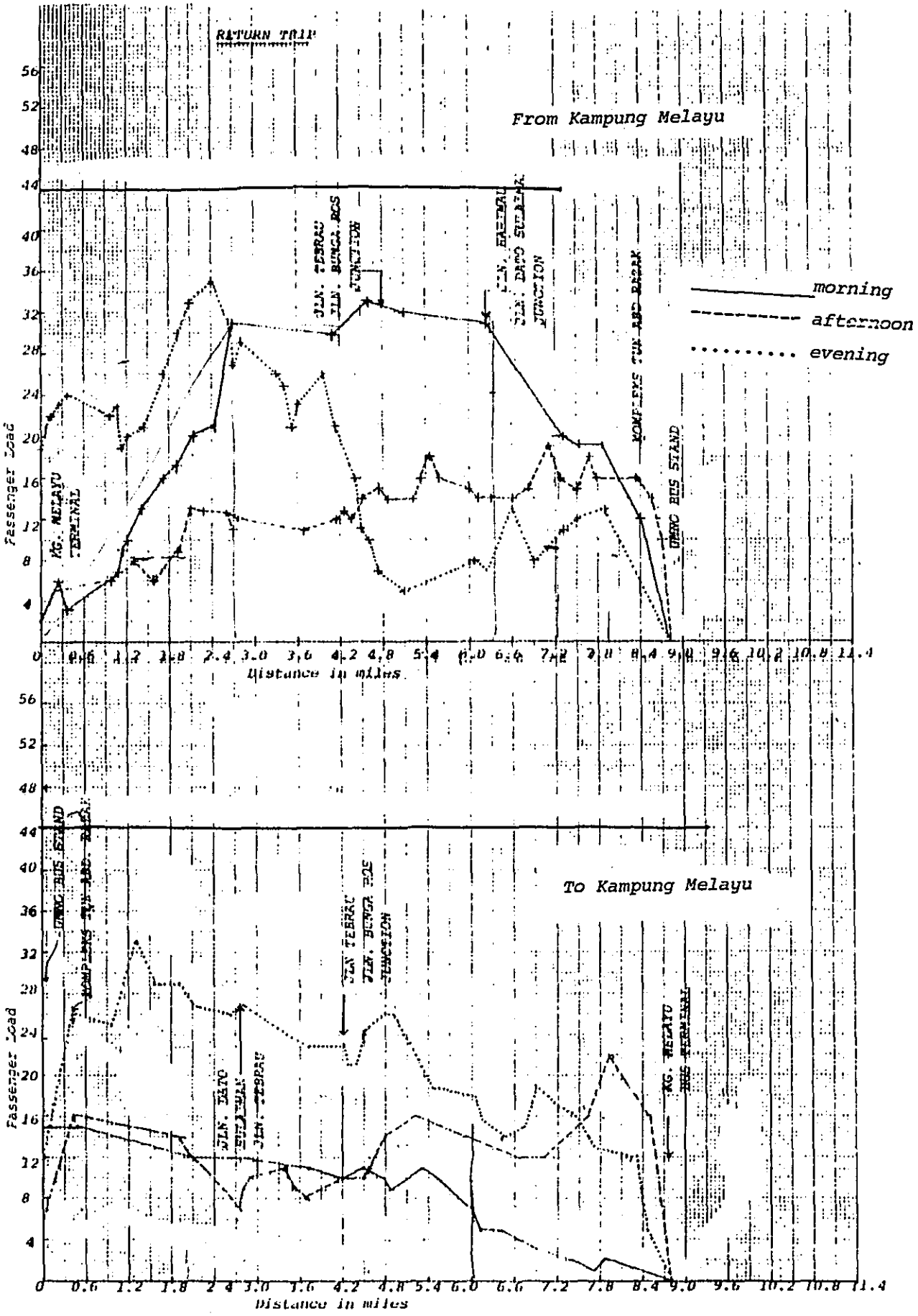


Fig. 4.17 : Passenger Load : Route 211 to Kampung Melayu

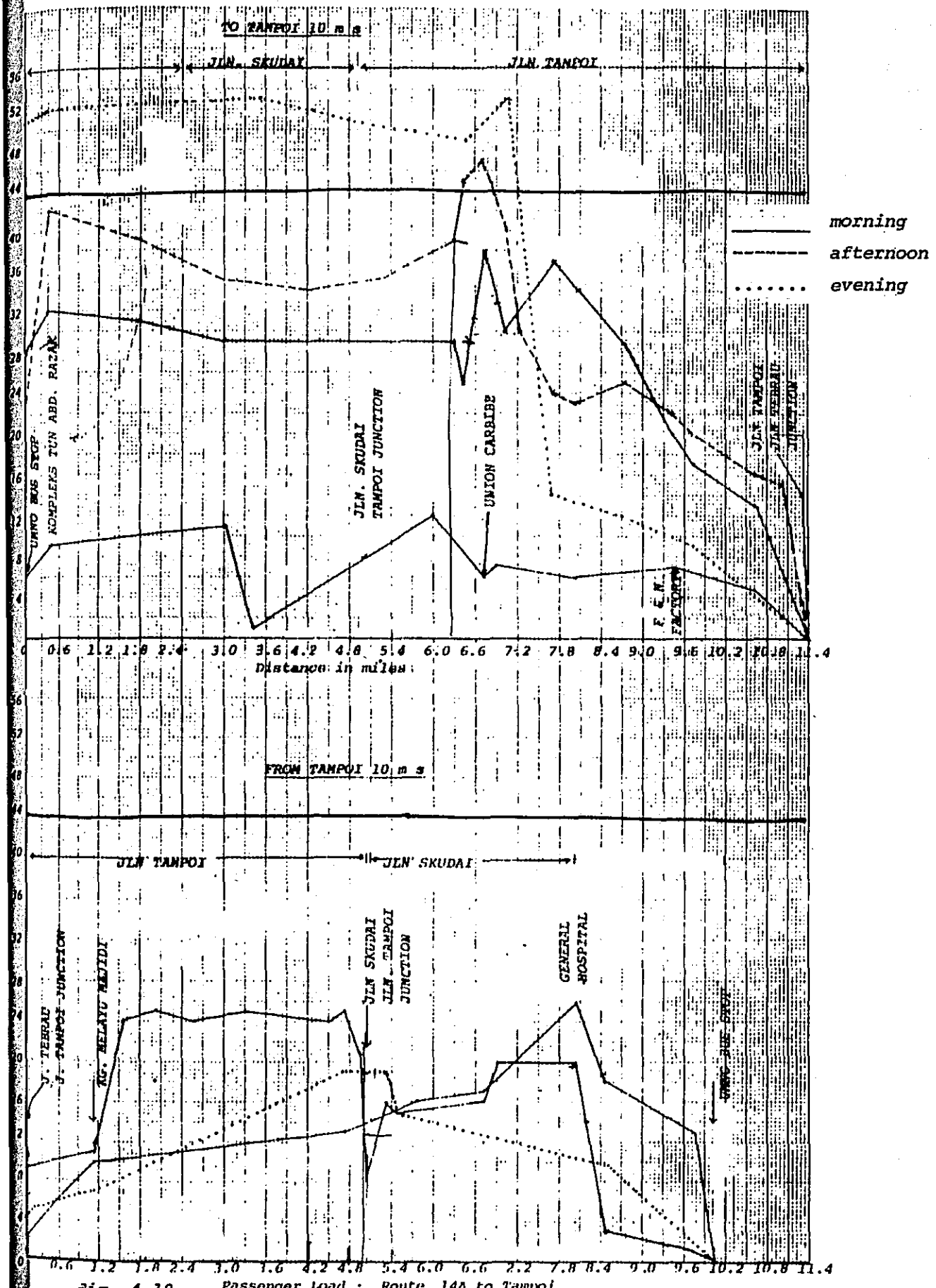


Fig. 4.18 : Passenger load : Route 14A to Tampoi

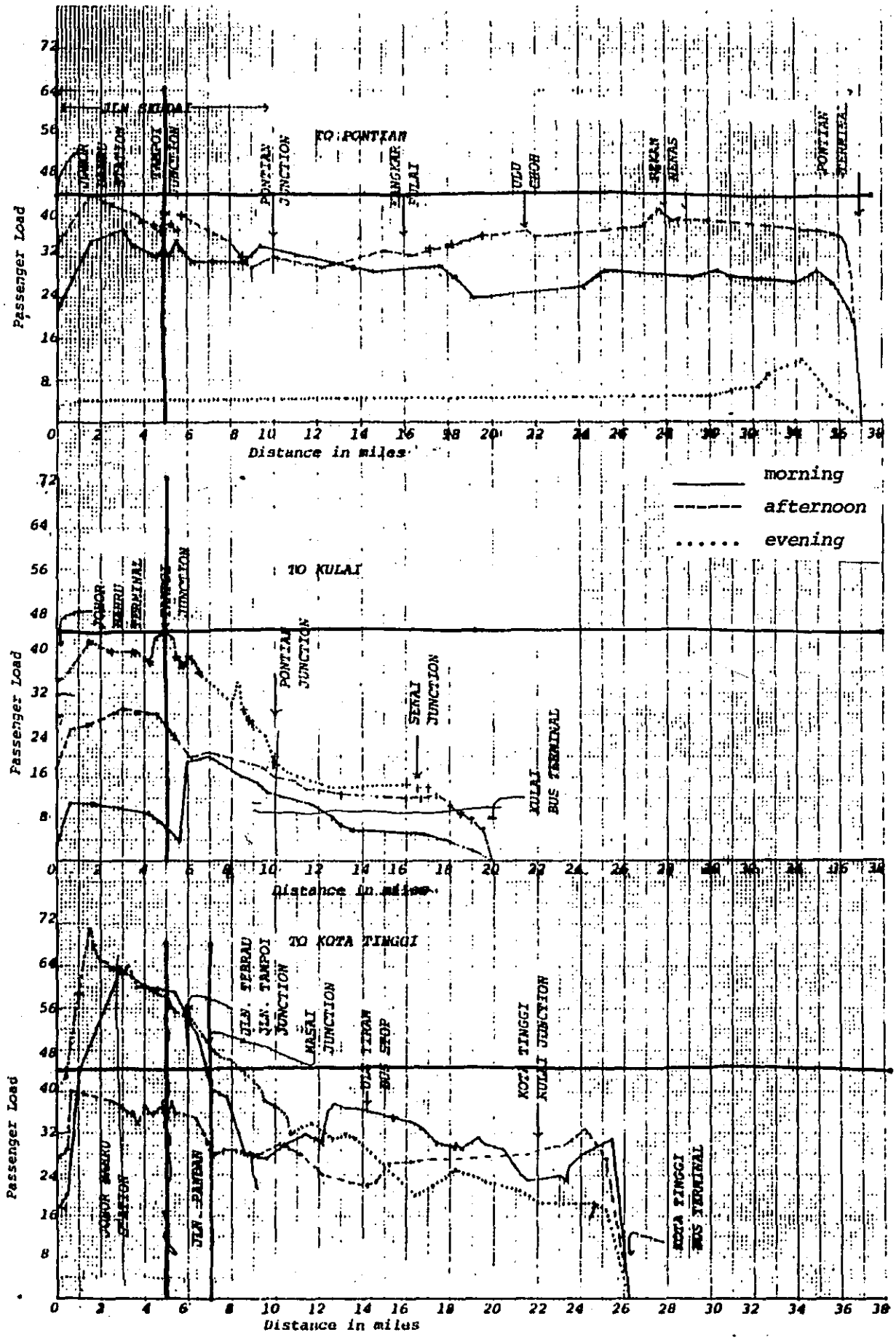


Fig. 4.19 : Passenger Load : Trips to Pontian, Kulai, Kota Tinggi.

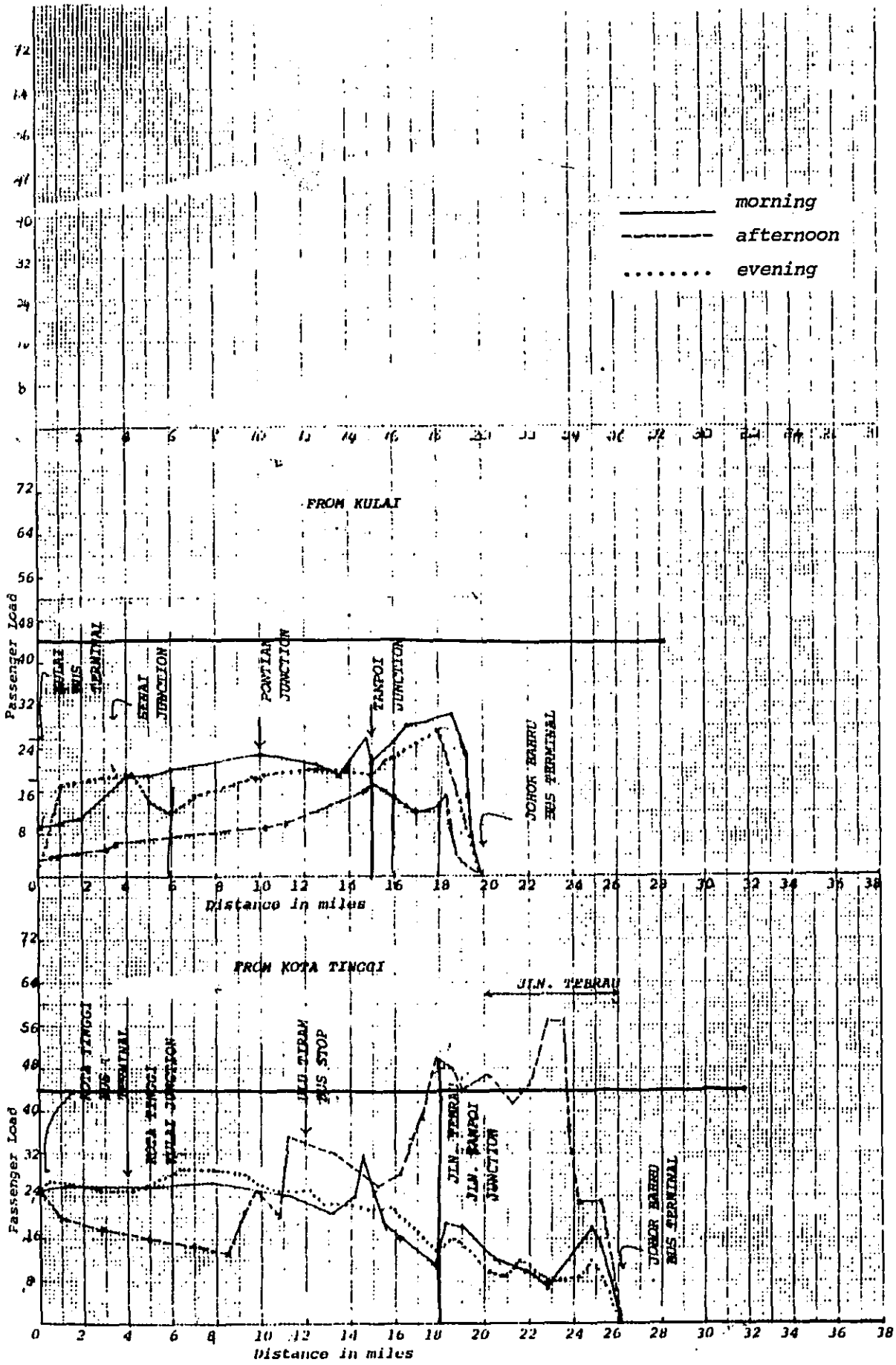


Fig. 4.20 : Passenger Load : Trips From Kulai, Kota Tinggi

4.2.4 Revenue and Costs

1. Fare System

The fare : 15 cents for the first mile and 6 cents for subsequent miles. For children between 5 and 14, the fare is at half rate. Children below 5 can travel free of charge.

2. Unit Revenue

Bus operating statistics and costs are shown in Table 4.25 to 4.30. Trends in unit characteristics are tabulated in Tables 4.20 to 4.25 and shown in Fig. 4.21.

There appears to be a wide range in the operating revenue per mile of the three major bus companies in Johor Bahru. In 1980, the unit revenue of 158 cents per mile of Company A was much higher than for Companies B and C at 124 and 121 cents per bus mile respectively. The unit revenue for Company A been consistently higher than the other two companies since 1977. Between 1977 and 1980, the unit revenue by Company A has grown at an average of 11% per year compared with Companies B and C's rates of 6% and 3% respectively. In fact, Company C suffered a decrease in revenue per mile in 1980 in addition to an absolute drop of 0.1%.

TABLE 4.20 : TREND OF REVENUE PER BUS MILE, 1976 - 1980 (Cents)

Company	1976	1977	1978	1979	1980	Average Growth p.a.
A	104.0	113.9	125.7	128.1	158.3	
		(9.5%)	(10.3%)	(1.9%)	(23.6%)	(11.1%)
B		103.3	107.2	111.5	123.7	
			(3.8%)	(4.0%)	(10.9%)	(6.2%)
C	108.8	113.2	118.4	121.3	121.0	
		(4.0%)	(4.5%)	(2.4%)	-	(2.7%)

Source : Urban Transport Study,Johor Bahru, 1981

The unit revenue of Company A increased by an average of 11% per year despite average passenger per mile growth of less than 2%. The tremendous growth in unit revenue of 24% in 1980 was because of the fare increase and also a 16% increase in passenger load. In 1980, passengers carried per mile by Company A was 4.42 compared with 2.65 by Company B and 4.79 by Company C. The load factor on the three companies were in the ratio of (C) 1.8 : (A) 1.07 (B) 1 in 1980. These positions have been maintained in the past 5 years. However Company B with a rate of increase of 10% in 1980 is expected to over take Company C which suffered a decrease of 11% in the same year.

TABLE 4.21 : PASSENGERS PER MILE , 1976 - 1980 (Cents)

Company	1976	1977	1978	1979	1980	Average Growth
A	4.17	4.17	3.94	3.81	4.42	
		-	(-5.5%)	(-3.3%)	(16.3%)	(1.4%)
B	-	2.3	2.5	2.4.	2.65	
			(8.7%)	(-4.0%)	(10.4%)	(4.8%)
C	5.66	5.9	5.1	5.4	4.79	
		(4.2%)	(1-13.6%)	(5.9%)	-11.3	(-4.3%)

Source : Urban Transport Study, Johor Bahru, 1981

The unit revenue of the rural feeder services at 91 cents and 107 cents (D and E, Table 4.25) in 1980 is much lower than for the urban services.

3. Unit Costs

In 1980, the operating cost per mile for the three companies was 127 cents for A, 125 cents for C and 112 cents for B. The unit operating cost of Company A has been increasing at an average of 10% per year, which is marginally (0.8%) less than the operating revenue. In the cases of Companies B and C, the unit operating cost has been increasing at about 6% per annum. The high rate of increase of unit operating cost by Company A catapulted it to be the most inefficient in 1980, followed closely by Company C, Company B appears to be 11.6% more efficient than Company A and 10% more than Company C.

TABLE 4.22 : TREND OF OPERATING COST PER BUS MILE*, 1976-1980 (Cents)

Company	1976	1979	1978	1979	1980	Average Growth (1976 - 1980)
A	85.8	87.7 (2.2%)	98.9 (12.8%)	102.4 (3.5%)	126.8 (23.8%)	(10.3%)
B	-	93.1	103.4 (11.1%)	105.1 (1.6%)	112.2 (6.7%)	(6.4%)
C	97.5	194.3 (1.8%)	106.4 (5.0%)	120.9 (13.6%)	124.8 (3.1%)	(6.3%)

* : excluding financial costs

Source : Urban Transport Study, Johor Bahru 1981.

Despite the high operating costs, Company A has been able to produce profit margins of about 20% in three of the last four years. The profit margin of Company B after dropping in 1978 because of reduced a revenue growth and increased operating cost has been increasing steadily since then to about 10% in 1980. On the other hand, Company C has been experiencing revenue growth lower than cost growth and in 1980 experienced a loss of 4 cents per bus mile.

TABLE 4.23 : UNIT PROFIT AND PROFIT MARGIN PER MILE, 1976-1980 (Cents)

Company	1976	1977	1978	1979	1980
A Unit Profit	18.2	26.2	26.8	16.6	31.5
Margin	(17.5%)	(23.0%)	(21.3%)	(13.0%)	(19.9%)
B Unit Profit	-	10.2	3.8	6.4	11.6
Margin	-	(9.9%)	(3.5%)	(5.7%)	(9.4%)
C Unit Profit	11.3	11.9	12.0	0.4	3.7
Margin	(10.4%)	(10.5%)	(10.1%)	(0.3%)	(-0.3%)

Source : Urban Transport Study, Johor Bahru 1981.

The operating costs of the rural feeder services at 87 cents (Company D) and 101 cents (Company B) are much lower than the urban services.

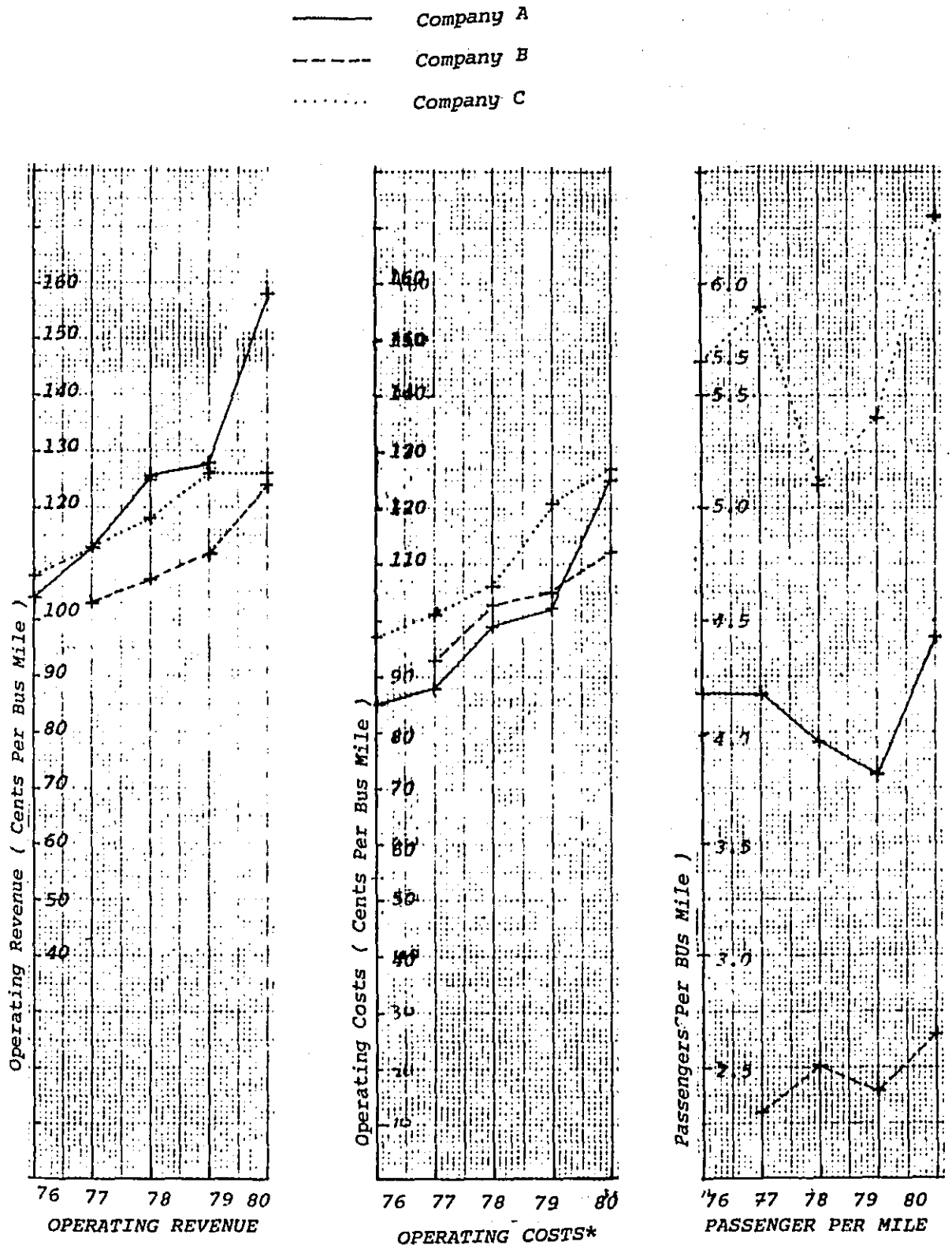


Fig. 4.21 : Operating Revenue, Costs and Passenger per Mile Comparisons

In 1980 wages formed about 37% of the operating cost of urban bus companies and 25% of the rural feeder services. Fuel, lubricant and tyres accounted for 20% and repairs and servicing another 20%.

Between 1977 and 1980, while total cost increased by an average of 9% per year in the three companies, repairs increase by 15% per annum, wages increased by 8% and fuel and lubricant by 7%. This increase in maintenance cost is most dramatic in Companies A and C where an increase of 18% per annum is recorded. (Table 4.24). But in terms of cost per mile Companies A and C are 73% and 43% respectively less efficient than Company B.

TABLE 4.24 : GROWTH IN WAGES, FUEL AND LUBRICANTS, AND MAINTENANCE AND REPAIRS 1977 - 1980 (Cents)

Company	Year	Wages		Fuel, Lubricant types		Maintenance Repairs		Total	
		Cents per mile	Annual Growth	Cents per mile	Annual Growth	Cents per mile	Annual Growth	Cents per mile	Annual Growth
A	1977	35.5		20.8		18.5		87.7	
	1980	48.7	(11.1%)	26.8	(8.8%)	30.7	(18.4%)	126.8	(13.1%)
B	1977	36.3		19.4		10.7		93.1	
	1980	40.7	(3.5%)	23.3	(6.3%)	17.8	(18.5%)	112.1	(6.4%)
C	1977	34.6		20.8		13.3		99.1	
	1980	44.1	(8.4%)	23.6	(4.3%)	25.4	(24.1%)	124.8	(8.0%)
Average increase 1977 - 1980 (% per annum)			(7.7%)		(6.5%)		(15.4%)		(9.2%)

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.25 : BUS OPERATING STATISTICS, 1980

	Bus Mileage Operated ('000 miles)	Passengers carried ('000)	Gross Revenue ($ '000)	Operating Costs ($ '000)	Profit (Loss) ($ '000)	Revenue per mile (Cents)	Cost per mile (Cents)	Passengers per mile (Persons)	Fare 'er Passengers (Cents)
A Alec	3,547.1	15,679.4	5,616.3	4,498.6	1,117.7	158.3	126.8	4.42	35.8
B South Johor	4,775.1	12,668.1	5,905.6	5,353.2	552.4	123.7	112.1	2.65	46.6
C T. Hakkim	730.0	3,500.0	884.3	910.6	26.3	121.0	124.7	4.79	25.3
D Kulai Tai Hin	153.3	-	139.3	128.7	10.6	90.9	84.0	-	-
E New Seelong	25.6	34.7	27.4	25.9	1.5	107.0	101.2	1.36	79.0

Source : Urban Transport Study, Johor Bahru, 1981

TABLE 4.26 : BUS OPERATING STATISTICS 1977

	Bus Mileage Operated ('000 miles)	Passengers carried ('000)	Gross Revenue ($ '000)	Operating Costs ($ '000)	Profit (Loss)	Revenue per mile (Cents)	Cost per mile (Cents)	Passengers per mile (Persons)	Fare 'er Passengers (Cents)
A Alec	3,358.2	14,008.3	3,825.8	2,946.5	579.3	113.9	65.9	3.63	27.3
B South Johor	4,443.0	10,160.8	4,590.1	4,138.5	451.6	103.3	93.1	2.29	45.2
C T. Hakkim	730.0	4,133.8	794.1	740.2	(53.9)	108.8	122.1	5.7	19.2
D Kulai Tai Hin	-	-	138.9	126.0	12.9	-	-	-	-
E New Seelong	25.4	32.0	26.1	23.7	2.4	102.7	93.3	1.25	81.5

Source : Urban Transport Study, Johor Bahru, 1981

TABLE 4.27 : BUS OPERATING STATISTICS (1972)

	Bus Mileage Operated ('000)	Passengers carried ('000)	Gross receipts ('000)	Operating Costs ('000)	Gross Profit or Loss ('000)	Receipts per mile (Cents)	Cost per mile (Cents)	Passengers per mile (persons)	Fare per Passenger (Cents)
A South Johor Bus Co. Bhd.	4,632.4	11,102.5	3,216.5	2,517.0	699.5	69.1	54.3	2.4	30.0
B Alec Bus Sdn. Bhd.	3,511.7	12,893.2	1,912.7	1,896.03	16.7 (Net)	54.5	54.0	3.5	14.8
C T, Hakkim Sdn. Bhd.	730.0	2,519.5	371.0	341.1	29.9 (Net)	51	46	3	15
D Sharikat Maju Bhd.	2,200.0	1,010.0 (Estimated SJR280,000)	558.2	592.0	(33.7)	24	27	0.5	55
E Pontian Bus Co. Ltd.	N O T A V A I L A B L E F O R 1 9 7 2								
F Tai Hin Bus	360.6	57.7	69.2	55.8	18.4	23	18	0.2	120
G New Seelong Bus Co.	58.4	25.5	16.7	16.1	.6	28.6	27.7	0.4	65
Total	11,439.037	27,608.451	6,144.330	5,418.029	726.301	53.7	46.3	2.4	22.3

Source : South Johor Study, 1973

TABLE 4.28 : BUS COMPANY EXPENSES, 1980

Company	Depreciation vehicle rental		Licence		Interest		Wages(incl. EPF)		Fuel & Lubricant		Tyres		Repairs & Service		Others		Total **	
	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	,$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile
A	517.3	14.5	89.8	2.5	-	-	1,730.1	48.7	707.6	19.9	245.9	6.9	1,088.3	30.7	119.5	3.4	4,498.6	126.8
B	173.4	3.6	333.2*	6.9	44.0	0.9	1,942.5	40.7	809.5	17.0	301.7	6.3	850.1	17.8	942.8	19.7	5,353.2	112.1
C	48.7	6.7	4.2	0.6	149.3	20.4	321.7	44.1	113.7	15.6	58.5	8.0	185.5	25.4	157.3	21.6	910.6	124.8
D*	18.4	12.0	12.7	8.2	3.9	2.5	23.5	15.3	——	——	54.9	35.8	——	——	20.6	13.4	128.7	63.0
E	11.4	5.1	0.4	-			8.2	32.0	5.0	19.5	1.4	5.5.	7.5	2.9	2.0	7.8	25.9	93.0

* 1979 Data ** excluding interest

Source : Urban Transport Study Johor Bahru 1981

TABLE 4.29 : BUS COMPANY EXPENSES, 1977.

Company	Depreciation vehicle rental		Licence		Interest		Wages(incl.) EPF)		Fuel & Lubricant		Tyres		Repairs & Service		Others		Total**	
	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile	M$'000	Cents per bus mile
A	124.2	3.7	143.1	7.2	22.5	0.7	1,191.8	25.5	524.2	15.6	174.1	5.2	619.8	18.5	69.3	2.1	2,946.5	87.7
B	119.0	2.6	586.0	13.1	17.2	0.4	1,612.6	26.3	658.9	14.8	204.6	4.6	479.5	10.7	477.9	10.8	4,138.5	93.1
C	60.4	8.2	3.5	0.5	168.0	2.3	252.3	34.6	102.6	14.1	49.1	6.7	97.5	13.3	157.9	21.6	723.3	99.1
D	25.5	-	11.3	-	2.7	-	15.8	-			71.3	-			19.2	-	-	-
E	1.0	3.9	1.6	6.3	-	-	8.1	31.9	3.5	13.8	1.3	5.1	6.0	23.6	2.3	9.1	23.7	93.3

** excluding interest

Source : Urban Transport Study Johor Bahru 1981

TABLE 4.30 : BUS OPERATING EXPENSES (1972)

Co	Vehicle Depreciation		Fuel & Lubricants		Tyres		Repairs to vehicle		Licence fees		Labour		EPF		Others Expenses		Total	
	M$	Cents	M$	Cents	M$	Cents	M$	Cents	M$	Cents	M$	Cents	M$	Cents	M$	Cents	M$	Cents
A	125313	2.7	348579	7.5	162534	3.5	390399	8.4	621767	13.4	841570	18.2	-	-	26850	0.6	2517012	54.3
B	47224	1.3	230410	6.6	128633	3.7	398719	11.4	299587	8.5	607195	17.3	29461	0.8	154805	4.4	1896034	54.0
C	53881	1.4	32105	4.4	15538	2.1	30187	4.1	50317	6.9	110716	15.2	8332	1.1	39978	5.5	341054	46.7
D	58838	2.6	98158	4.5	52000	2.4	142221	6.5	165431	7.5	28868	1.0	12261	0.5	35002	1.6	591980	26.9
E	N O T A V A I L A B L E F O R 1 9 7 2																	
F	N O T A V A I L A B L E F O R 1 9 7 2																	
G			2880	5.0	960	1.6	840	1.4	3028	5.2	7000	12.0	-	-	1440	2.5	16148	27.7
Total	254456	2.6	712132	6.4	359665	3.2	962366	8.5	1140130	10.2	1595349	14.3	50054	0.4	258075	2.3	5362228	48.2

Source : South Johor Study, 1973

4. Financial Viability

The financial statements for the town bus companies are shown in Table 4.31. These costs indicated include interest on short and long term loans.

From 1976 to 1980, Company A enjoyed considerable profits and a good rate of return. After the loss in 1976 and a setback in 1978, Company B's profits have increased steadily (87% in 1980). This was due to a significant increase in revenue per mile and also a comparatively low increase in operating costs. Company C has been experiencing losses since 1976. While revenue has kept pace with South Johor's up to 1979, there was a marginal decrease in revenue in 1980. Operating costs continued to be the highest among the three companies until 1980 when it was marginally less than Company A. In addition, in 1980 Company C maintained interest of $150,000 which increased its cost by 16% (or 20 cents per mile) and was equivalent to 97% of its paid-up capital. The companies appears under-capitalised.

TABLE 4.31 : FINANCIAL STATEMENTS OF BUS COMPANIES (1976 - 1980)
($ '000)

		1976	1977	1978	1979	1980
A Alec	Revenue	3,075.4	3,825.8	3,934.5	4,702.5	5,616.3
	Cost*	2,539.3	2,969.0	2,102.2	3,758.2	4,498.6
	Profit	536.2	856.8	832.9	944.2	1,117.9
	Profit Margin	17.4%	22.4%	21.2%	20.1%	19.9%
	ROI**	41.5%	66.3%	64.5%	73.1%	86.5%
B South Johor	Revenue	4,063.2	4,590.1	4,586.7	5,204.0	5,905.6
	Cost*	4,298.2	4,155.8	4,445.2	4,932.1	5,397.2
	Profit	(235.2)	434.3	41.5	271.9	508.4
	Margin	-	9.5%	0.9%	5.2%	8.6%
	ROI**	-	13.3%	1.3%	8.3%	15.6%
C Hakkim	Revenue	794.0	826.2	864.2	885.3	884.3
	Cost*	893.4	908.2	938.2	1,037.7	1,059.9
	Loss	(99.4)	(82.0)	(74.0)	(152.6)	(175.6)
	Margin	-	-	-	-	-
	ROI**	-	-	-	-	-

* including financial costs.
** Return on Investment or Profit/Paid-up Capital.

Source : Urban Transport Study, Johor Bahru, 1981.

4.2.5 Bus Facilities

1. Central Terminal

The central terminal is located at the end of Jalan Trus, at the periphery of the town centre (Fig 4.14). Most urban and intra-regional services do not usually go into the bus terminal. (It is used by inter-regional express buses and also by scheduled bus to Singapore, and by taxis)

Scheduled buses use the central terminal only for minor reasons. Buses wait at the other end of the route and repairs and servicing are done at workshops located away from the town centre.

Most passengers board and alight at the main bus-stands at Jalan Ah Fook and Jalan Tun Razak (in the CBD). These bus-stands are also near the taxi-stations at Jalan Station and Jalan Segget. Thus passengers who want to change to outstation taxis drop there.

It may be surmised that the bus terminal does not actually perform the functions of dropping/picking passengers or as an interchange between modes (except for express buses to the north and both express and scheduled bus to Singapore.

2. Bus-stands in Central Area

The central bus-stands are at Jalan Ah Fook and Jalan Tun Razak. The Jalan Ah Fook (near UMNO Building) group consists of 5 bus-stands, each about 1.2m x 2.4m spaced about 1.2m apart. This is inadequate to protect waiting users from the sun and rain. There are no lay-bys and the linear arrangement of bus-stops is not compatible with the number of bus movements (78 per hour). There is a need for a dual-channel bus-stand or decentralisation.

There was a recent shift of bus-stands at Jalan Ah Fook (near the market) to Jalan Tun Razak. This was to avoid the congestion at near the market. The operation of these stands has not been long enough for analysis. However, it is noted that the incidence alighting passengers crossing Jalan Tun Razak (a dual carriageway) is high and causes a problem of safety.

3. Other Bus-stops

The classification of bus-stops is shown in Table 4.32 and Fig 4.22.

In general bus-stops tend to be inadequately provided for in terms of shelter against sun and rain, in terms of lay-bys so as not to block traffic and in terms of bus information.

Table 4.32 Bus-Stop Types

SECTION NUMBER	SECTION NAME	STREET NAME	A	A'	B	B'
1	TOWN AREA	JLN. SELAT TEBRAU			1	1
		JLN. TUN DR. ISMAIL	2	2	1	1
		JLN. WONG AH FOOK			4	4
		JLN. DUKE	13	1		
		JLN. TRUS	4			
		JLN. AIR MOLEK	13	1		
		JLN. ABDUL RAHMAN ANDAK	2	2		
2	CENTURY GARDENS-KEBUN TEH	JLN HARIMAU	11	11		
		JLN DATO SULAIMAN	6	6		
		JLN. KEBUN TEH	11	11	2	
3	KG. MELAYU-KG. MAJIDI	JLN. RAHMAT	6	9		
		JLN. KENANGAN	4	4		
		JLN. STULANG BARU	4	4		
		JLN. BUDIMAN	4	4		
		JLN. MERDEKA	6	6	7	3
		JLN. MASJID	3	1	3	
		JLN. BUNGA ROSE	9	7		
		JLN. ANTOI	11	3		
		JLN. MELOR	9	3		
		JLN. CEMPAKA	10	6		
		JLN. BUNGA RAYA KECIL	8	8		
		JLN. TEBRAU	9	7	21	1
4	JLN. SCUDAI-MOSBERT	JLN. TUN DR. ISMAIL			4	
		JLN. SKUDAI			20	
5	KANGKAR TEBRAU	JLN. KOTA TINGGI	2		4	
6	LARKIN - KEMPAS	JLN. LARKIN			2	
		JLN. DATO JAFFAR			2	
		JLN. SENTOSA	2			
		JLN. DATO ABDULLAH HJ. OSMAN	4			
		JLN. UNGKU MOSHIN	1			
		JLN. ISNIN	2			
		JLN. AHAD	2			
		JLN. KASAWARI	2			
		JLN. LANGKASUKA	9		2	
		JLN. ASAS	2			
		JLN. DEWATA	1			
		JLN. GARUDA	1			
		JLN. MERBAH	8			
		JLN. PETALING	2			
		JLN. TAMPOI	2		6	
		JLN. RAJA UDANG	4			
		JLN. KEMPAS	18			
		JLN. DATIN HALIMAH	6		6	
7	PELANGI	JLN. STULANG DARAT			2	
		JLN. PASIR PELANGI			2	
		JLN. YAHYA ALDATAR			2	

8	KG. MD. AMIN - KG. BARU (KOLAM AIR)	JLN. MAHMODIAH	6	1	17	
		JLN. PETRI	9	9		
		JLN. MARIMAH	2	2		
		JLN. ABDUL SAMAD	8	8		
		JLN. NONG CHIK	5	5	2	
		JLN. WIRAMAN	1	1		
		JLN. TARUM	2	2	4	
		JLN. SUNGAI CHAT	4	4	4	
		JLN. TASEK UTARA			4	
		JLN. CAPTAIN MOHD. AMIN	10	6	3	1
		JLN. KOLAM AIR	13	10	1	1
		JLN. YAHYA AWAL	8	4	10	1
		TOTAL	283	148	136	13
		PERCENTAGE %				

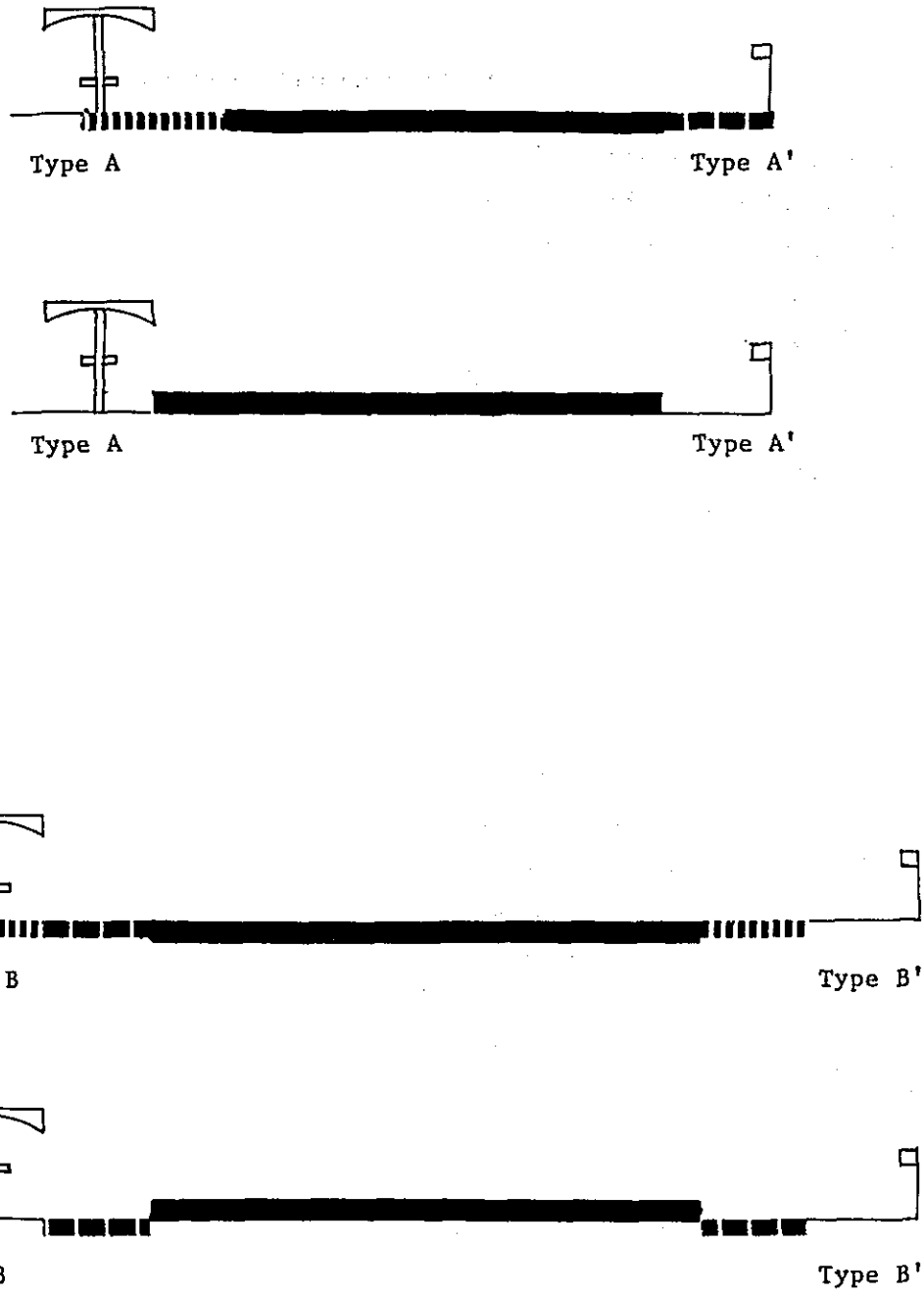


Fig. 4.22 Bus-stop Types

4.3 Passenger Characteristics

Interviews were conducted at bus-stops. They were stratified by landuses, viz: town centre, town periphery, medium density residential, low density residential, industrial, village and regional towns. Further details are mentioned in the Chapter 2 on Surveys.

4.3.1 Personal Characteristics

For all landuse categories except the periphery, the ratio of men to women bus users is approximately 60 to 40.

Table 4.33 : Sex of Bus-Users.

Land Use Category	Male %	Female %
Town Centre	56.5	43.5
Town Periphery	40	60
Medium Density Residential	60	40
Low Density Residential	59	41
Industrial Area	56	44
Rural Town	64	36
Regional Towns	54	46

Source: Urban Transport Study, Johor Bahru, 1981.

Passenger's ages tend to be well distributed with most passengers between 15 and 40 except in the industrial area, where more than three-quarters of the passengers are between 15 and 30. The low density residential zone also evinces a higher incidence of children below 15 years than the other landuse zones.

Table 4.34 : Age Distribution of Bus-Users

Land Use Category	7-14	15-19	20-29	30-39	40-47	50+
Town Centre	3.5	26.5	35.0	20.0	9.0	6.0
Town Periphery	2.5	35.0	33.7	18.8	8.7	1.3
Medium Density Residential	1.0	23.0	35.0	26.0	5.0	10.0
Low Density Residential	7.0	26.0	32.0	16.0	10.0	9.0
Industrial Area	-	22.0	56.0	10.0	6.0	6.0
Rural Town	4.0	20.0	20.0	22.0	14.0	20.0
Regional Towns	4.6	28.7	34.7	10.0	11.3	10.7

Source: Urban Transport Study, Johor Bahru, 1981.

From the samples interviewed it appears that the proportion of bus-users who are in the administrative, managerial, professional and technical groups is very low. Except in the rural town and industrial area, students form the most prominent group of bus-users. Housewives, and those engaged in the factory, construction, clerical, sales and service sectors are also prominent bus users.

Table 4.35 : Occupation of Bus Users

	Administrative + Managerial	Professional + Technical	Clerical & relates	Sales	Services	Factory, Construction, Transport	Agriculture, Animal Husbandry, Forestry, Fishing	Student	Housewife	Others	Total
Town Centre	0.5	3.5	12.5	7.5	9.0	18.0	2.5	21.0	16.5	10.0	100%
Town Periphery	-	1.0	31.2	-	-	2.5	-	36.3	17.5	7.5	100%
Medium D. Residential	-	2.0	3.0	2.0	9.0	12.0	-	21.0	13.0	38.0	100%
Low D.Residential	1.0	4.0	7.0	3.0	11.0	9.0	5.0	28.0	12.0	22.0	100%
Industrial	4.0	2.0	6.0	4.0	14.0	32.0	4.0	12.0	16.0	6.0	100%
Rural Town	2.0	-	2.0	12.0	4.0	32.0	4.0	18.0	10.0	16.0	100%
Regional Towns	-	0.7	7.1	8.7	9.3	15.3	8.6	30.7	13.3	5.3	100%

Source: Urban Transport Study, Johor Bahru, 1981.

4.3.2 Vehicle Ownership Characteristics

The percentage of respondents who own cars was less than 10% for the residential and industrial zones and rural and village towns. In these cases, the main reason for not using their own cars was because the cars were under repair, except in the low density residential area which is near to town and served by several bus routes, here parking and congestion problems explains why 56% (5 out of 9) did not use their own cars.

Respondents interviewed in the town centre and town periphery had a higher incidence of car ownership 13.5% and 17.5% respectively. Some 75% of town-centre respondents and 72% of town periphery respondents owned cars but did not use them because of parking or congestion problems.

The percentage of respondents who own motorcycles range from 6.0 to 18.0%. The incidence is highest in the industrial zone, low density residential zone and rural town. Respondents interviewed in the rural and village towns did not use their motorcycles because of danger and rain (100% and 80% respectively) In the town centre and periphery, repairs account for half the cases of non-use. Danger, tiredness and rain account for the rest. In the medium density residential area, danger accounts for all the cases of non-use, while in the low density residential zone, which lies adjacent to the town proper and can be reached by roads with little traffic, tiredness and rain are the overriding reasons. It can be discerned that danger as a reason for not using the motorcycle increases with the distance to be travelled and depending on the volume of traffic on the roads to be traversed.

Table 4.36 : Vehicle Ownership of Bus-Users

Land Use Category	Car %	Motorcycle %
Town Centre	13.5	8.5
Town Periphery	17.5	8.7
Medium Density Residential	8.0	6.0
Low Density Residential	5.0	13.0
Industrial	6.0	18.0
Rural Town	4.0	14.0
Regional Towns	3.5	9.3

Source: Urban Transport Study, Johor Bahru, 1981.

Table 4.37 : Reasons for not using car

Land Use Category	Under Repair	Parking	Parking too far	Traffic Congestion
Town Centre	25.0	17.0	29.0	29.0
Town Periphery	28.5	-	14.3	57.2
Medium Density Residential	100.0	-	-	-
Low Density Residential	44.0	12.0	-	44.0
Industrial	100.0	-	-	-
Rural Town	100.0	-	-	-
Regional Towns	100.0	-	-	-

Source: Urban Transport Study, 1981

Table 4.38 : Reasons for not using own motorcycle

Land Use Category	Under Repair	Danger	Tiredness	Rain
Town Centre	50.0	11.0	33.0	6.0
Town Periphery	50.0	34.0	-	16.0
Medium Density Residential	67.0	33.0	-	-
Low Density Residential	28.6	-	28.6	42.8
Industrial	45.0	33.0	-	22.0
Rural Town	-	50.0	-	50.0
Regional Towns	20.0	72.0	8.0	-

Source: Urban Transport Study, Johor Bahru, 1981.

4.3.3 Trip Characteristics

1. Purpose and Destination

Among all the landuse categories, home trips constitute the most prevalent purpose. In the town centre, shopping seems to be the next most important category followed by work trips while in the town periphery there are more work trips than shopping trips. In residential areas, shopping, and social trips are more than school or work trips. In rural and regional towns, the incidence of shopping and business trips are relatively high.

Residences seem to be the dominant type of destination for all landuse categories. In the town area, offices and shops seem to be the next most important categories. In the residential areas, school trips are second in importance to names as destinations. On the other hand, passengers from rural town and regional towns, tend to go to retail and wholesale shops.

Table 4.39 : Trip Purpose of Bus Users

Land Use Category	Work	School	Business	Home	Shopping	Recreation	Religious	Social	Others
Town Centre	10.5	8.5	3.5	35.0	19.5	3.5	2.5	9.0	8.0
Town Periphery	21.2	10.0	3.75	43.7	13.7	-	-	-	5.0
Medium Density Residential	8.0	15.0	-	26.0	18.0	1.0	-	10.0	7.0
Low Density Residential	10.0	10.0	2.0	35.0	14.0	-	1.0	23.0	2.0
Industrial	10.0	6.0	2.0	40.0	12.0	-	-	20.0	10.0
Rural Town	-	2.0	12.0	28.0	28.0	14.0	-	10.0	6.0
Regional Towns	9.3	9.3	15.0	55.3	15.0	-	-	6.7	7.5

Source: Urban Transport Study, Johor Bahru, 1981.

Table 4.40 : Trip Destinations of Bus Users

	Residence	Government/ Private Office	Retail/ Wholesale Shop	Factory	Transport Facility	Education Institution	Religious Social Institution	Agriculture	Park+ Recreation	Others
Town Centre	50.5	7.5	10.5	5.0	-	6.5	4.0	-	3.0	13.0
Town Periphery	26.3	21.2	16.3	-	-	10.0	1.2	-	-	10.0
Medium D. Residential	25.0	3.0	12.0	2.0	-	13.0	1.0	-	1.0	19.0
Low D. Residential	39.0	2.0	3.0	4.0	2.0	9.0	1.0	-	-	40.0
Industrial	40.0	2.0	8.0	8.0	-	2.0	4.0	-	-	36.0
Rural Town	40.0	-	26.0	2.0	-	2.0	-	8.0	4.0	18.0
Regional Towns	58.0	5.3	16.0	2.7	-	8.0	0.7	0.7	2.0	5.6

Source: Urban Transport Study, Johor Bahru, 1981.

2.Frequency of Bus User Trips

The trip frequency pattern is shown in Table 4.41. The frequencies of use between once a week and once every day are quite well represented. No dominant pattern appears from the tabulation although it can be noted that frequencies of twice a day or more is not common.

Table 4.41 : Trip Frequency Per Week (%)

Land Use Category	1 - 2 times	3 - 4 times	5 - 6 times	once a day	twice a day	more than twice a day	Total
Town Centre	27.0	21.0	10.0	25.5	12.5	4.0	100
Town Periphery	23.7	18.8	6.3	26.2	20.0	5.0	100
Medium Density Residential	20.0	19.0	9.0	45.0	7.0	-	100
Low Density Residential	23.0	34.0	21.0	18.0	4.0	-	100
Industrial	18.0	36.0	20.0	22.0	4.0	-	100
Rural Town	46.0	18.0	12.0	20.0	2.0	2.0	100
Regional Towns	20.0	17.3	21.3	39.4	-	10.0	100

 Source: Urban Transport Study, Johor Bahru, 1981.

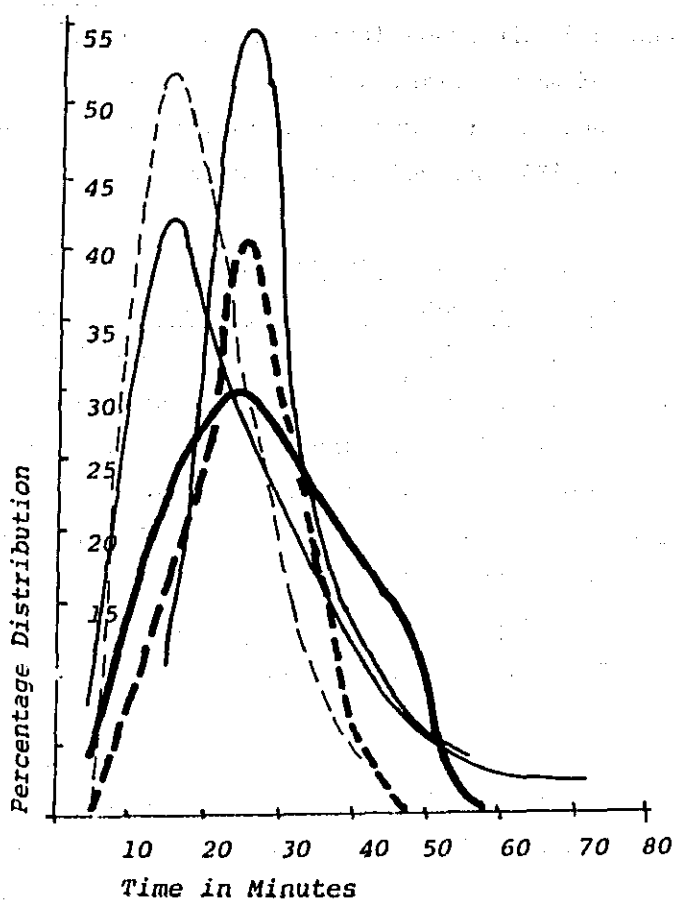
3. Travel Time

The travel time distribution of bus users interviewed at the various landuses and towns is shown in Figs 4.23. The average travel time is shown in Table 4.42. The travel time figures are consistent with their distance from Johor Bahru Town. The trip length for users interviewed in the regional towns is comparatively reduced because of short trips within these towns themselves as evinced by the dual peaks inFig. 4.23.

Table 4.42 : Average Trip Length

Land Use Category	Average Trip length (Minutes)
Town Centre	23.0
Town Periphery	27.0
Medium Density Residential	23.6
Low Density Residential	20.6
Industrial	28.2
Rural Town	21.2
Regional Towns	29.8

Source: Urban Transport Study, Johor Bahru, 1981.



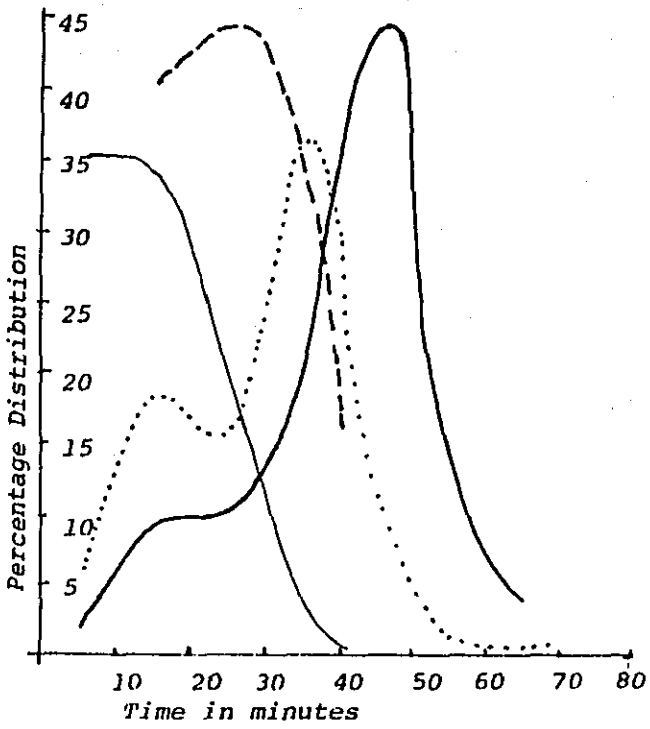


Fig. 4.23 : Travel Time(Trip Length Distribution Of Bus-Users

4. Transfers

Except for the rural town, the incidence of at least one transfer varies from 30% to 65%. The incidence of transfers is thus very high for such short trip lengths (Fig. 4.23).

Table 4.43 : Frequency of Transfers (%)

Land Use Category	None	Once	Twice
Town Centre	48.0	44.5	7.5
Town Periphery	35.0	60.0	5.0
Medium Density Residential	70.0	29.0	1.0
Low Density Residential	68.0	29.0	3.0
Industrial	52.0	40.0	8.0
Rural Town	94.0	6.0	-
Regional Towns	60.0	34.0	6.0

Source: Urban Transport Study, Johor Bahru, 1981.

4.3.4 Bus-stop Distance

The distribution of walking time to bus-stops is shown in Table 4.44 and Fig. 4.24. Assuming a maximum comfortable walk of 10 minutes or 150 metres, between 32% and 90% of bus-users are not adequately covered by bus-stops. Assuming 25 minutes or 400 Metres, the percentage not served varies from 1.0 to 20.5%.

Excluding respondents in town (whose houses may be anywhere in the Study Area) the industrial and residential areas seem poorly served if a 10 minute 150 metre standard is to be observed. For a 25 minute, 400 metre standard, the most badly served appear to be the rural town and medium density residential areas (Table 4.45).

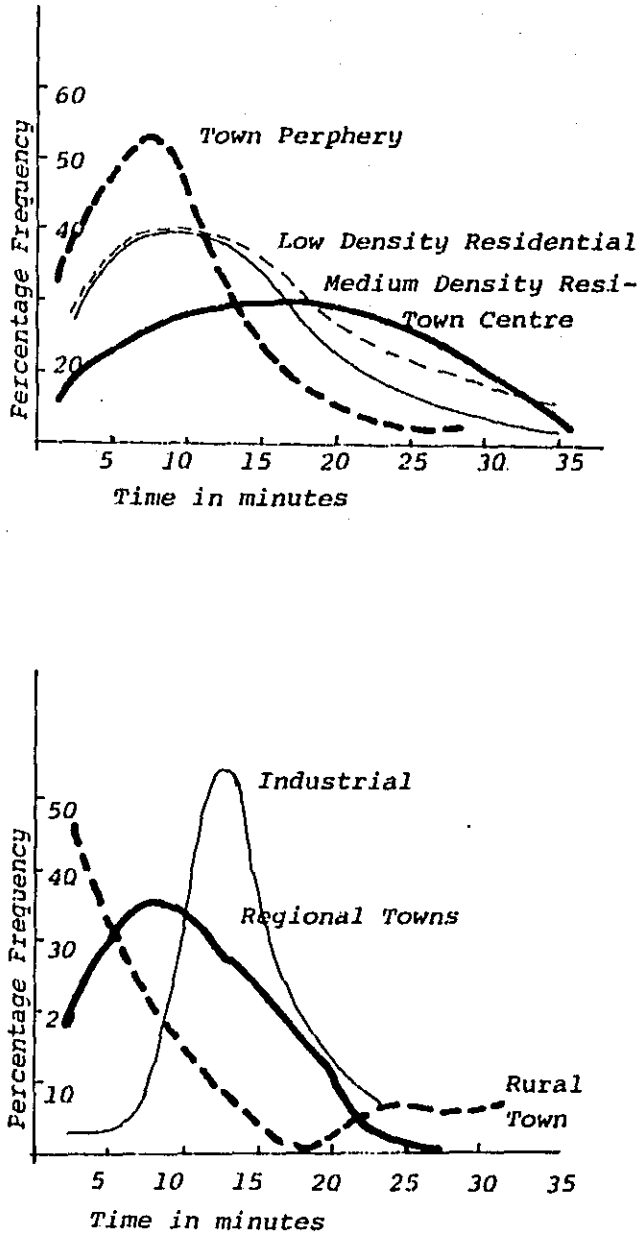


Fig. 4.24 : Distribution or House-to-bus-stop Walking Time

Table 4.44 : Distance of Bus-stop from House (%)

Interviewed at	0 - 4 mins	0 - 9 mins	10 - 14 mins	25 - 19 mins	20 - 24 mins	25 - 30 mins	more than 30 mins
Town Centre	7.5	15.0	18.5	19.5	12.0	19.0	8.5
Town Periphery	28.7	42.5	21.2	6.3	1.3	-	-
Medium Density Residential	17.0	29.0	24.0	11.0	8.0	4.0	7.0
Low Density Residential	19.0	29.0	26.0	15.0	10.0	-	1.0
Industrial	4.0	6.0	54.0	18.0	10.0	8.0	-
Rural Town	46.0	22.0	10.0	-	8.0	6.0	8.0
Regional Towns	19.3	34.7	26.7	16.0	2.7	2.0	0.6

Source: Urban Transport Study, Johor Bahru, 1981.

Table 4.45 : Percentage of bus-users living more than 10 minutes and 25 minutes from bus-stop.

	10 minutes (%)	25 minutes (%)
Town Centre *	77.5	20.5
Town Periphery *	28.8	-
Medium Density Residential	54.0	11.0
Low Density Residential	52.0	1.0
Industrial	90.0	8.0
Rural Town	32.0	14.0
Regional Towns	46.0	2.6

* refers to respondents' houses

Source: Urban Transport Study, Johor Bahru, 1981.

4.3.5 Waiting Time at Bus-stop

The waiting time at bus-stops is shown in Table 4.46. Assuming a maximum of 10 minutes as the comfortable limit, about 90% of passengers have to wait uncomfortably long in most landuse zones. (Table 4.47, Fig. 4.25). Even in the town centre, some 35.5% of passengers have to wait more than 10 minutes.

Table 4.46 : Waiting Time at Bus-stop

	0 - 4 mins	5 - 9 mins	10 - 14 mins	15 - 19 mins	20 - 24 mins	25 - 29 mins	more than 30 mins
Town Centre	34.5	30.0	23.0	5.5	4.0	2.0	1.0
Town Periphery	-	5.0	26.3	20.0	16.2	22.5	10.0
Medium Density Residential	2.0	43.0	10.0	8.0	10.0	7.0	14.0
Low Density Residential	-	6.0	14.0	23.0	33.0	18.0	6.0
Industrial	-	2.0	6.0	16.0	38.0	26.0	12.0
Rural Town	10.0	2.0	18.0	12.0	16.0	24.0	18.0
Regional Towns	2.0	9.7	21.3	16.7	16.0	9.3	25.3

Source: Urban Transport Study, Johor Bahru, 1981.

Table 4.47 : Percentage of Waiting Time more than 10 minute

Land Use Category	Percentage
Town Centre	35.5
Town Periphery	95.0
Medium Density Residential	55.0
Low Density Residential	94.0
Industrial	98.0
Rural Town	88.0
Regional Towns	88.3

Source: Urban Transport Study, Johor Bahru, 1981.

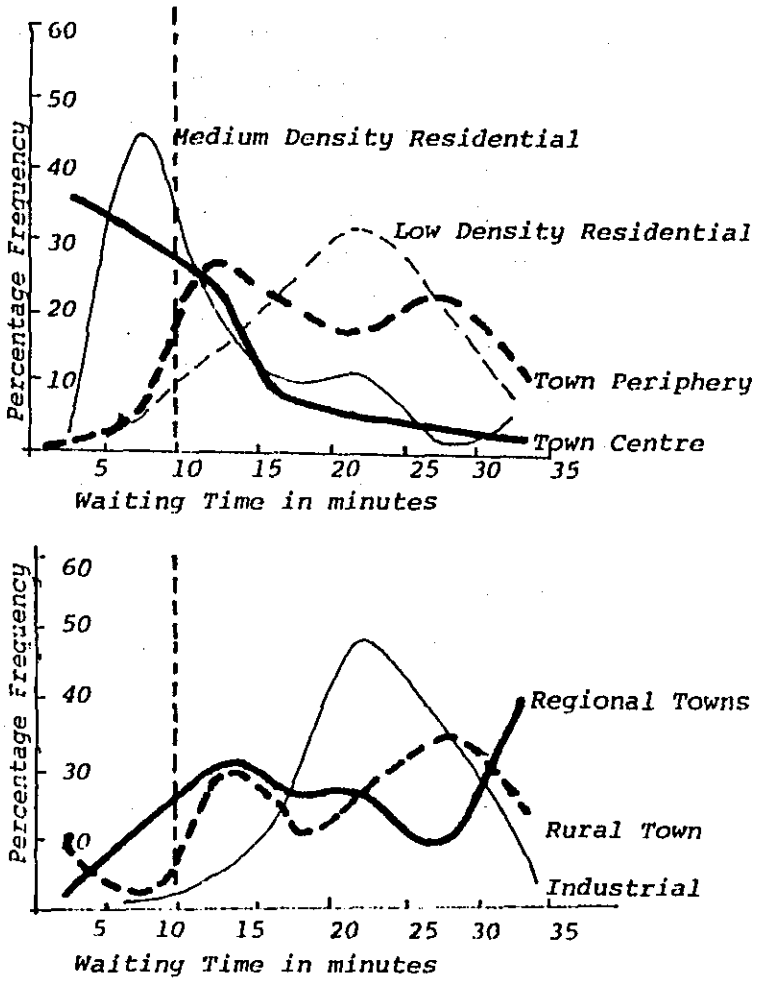


Fig. 4.25 : Waiting Time Distribution of Bus-users

4.4 Opinions on Vehicle Ownership and Bus Service.

4.4.1 Intention to Change Vehicle Ownership

Of the total of 252 respondents without a car, only one person or 0.4% intended to buy a car. Of the total of 255 respondents without a motorcycle, only 2% intended to buy one in the near future. Given this data, vehicle ownership appears to be relatively stable. However vehicle registrations are increasing at about 8% per annum. Without adequate data, a confident conclusion cannot be drawn. However, it may be that the intention to purchase a vehicle may come about as a result of a sudden spurt in income, eg. graduates entering the work force or workers crossing over the treshold income, which is difficult to sample.

The few respondents who wanted to purchase a private vehicle did so because of inconvenience in using public transport. The main reason for not buying a car or motorcycle was because respondents thought they were expensive.

4.4.2 Opinions on Existing Situation and Suggested Improvements

While weather is an inconvenience, most respondents cite distance to the bus-stop as a major inconvenience (Table 4.48) . Except in the town centre and periphery, more than 80% of respondents in each zone prefer nearer bus-stops. The average preferred distance is 8 minutes compared with the existing 16 minutes (Table 4.50).

The fact that routes and schedules are not shown does not bother respondents within Johor Bahru but is inconvenient to about two-thirds of out station respondents (Table 4.51). . Lack of shelter and seating is inconvenient in almost all the survey zones. From the survey, it appears that

the incidence of buses by-passing waiting passengers, is relatively minor. However, buses are not usually on schedule and the long wait seem to be inconvenient especially in the town periphery, the low density residential area, the urban kampung and Kulai.

The average waiting time of 25 minutes appear too long. An average preferred interval between buses is about 10 minutes. (Table 4.52).

The demand for new routes appear greater in the urban kampung, Ulu Tiram and Kota Tinggi. In Ulu Tiram there appears a need to link-up with Pasir Gudang which is not directly provided for. The town centre, periphery and low density residential area are currently well served by routes; the response thus refers to routes in other parts of the town. The sampled housing estate adjoins Jalan Tebrau and is thus well served by bus routes, thus accounting for the low response. Kulai, which is served by the Air Hitam highway does not need new routes but the response on waiting time at the bus-stop indicates a higher frequency is required.

The survey indicates a need to have circular routes by-passing the town to avoid transfers and also for more bus routes to penetrate the newer residential areas.

The blockage of doors, insufficiency of seats and overcrowding recorded imply an urgent need for improvement (Table 4.54). Bigger buses and standee buses are strongly preferred (Table 4.55). Heat and dirt are also problems but respondents appear unwilling to pay a higher fare for air-conditioning (same table). Respondents felt there was a need to increase bus-speed (Table 4.56 and 4.57) but not to increase bus fare.

Of the above improvements, nearer bus-stops

and more frequent services appear the most urgent (Table 4.58). Better bus-stops and faster buses are second in importance. More routes appears to be of significance too. Bigger buses and standee buses are also important but of lower priority. Airconditioning seem to be of low priority.

TABLE 4.48 : OPINIONS ON INCONVENIENCE GOING TO BUS-STOP

Zone	Percentage		
	Hot	Rain	Too Far
Town Centre	2	2	97
Town Periphery	2	2	80
Low Density Residential	57	2	42
Housing Estate	4	4	100
Urban Kampung	22	9	89
Ulu Tiram	24	20	67
Pontian	64	-	91
Kulai	4	4	100
Kota Tinggi	11	42	42

Source: Urban Transport Study, Johor Bahru, 1981.

TABLE 4.49 : OPINION ON DISTANCE TO BUS-STOP

Zone	Percentage saying bus stop too far	Percentage wanting nearer bus stop
Town Centre	97	22
Town Periphery	80	67
Low Density Residential	42	89
Housing Estate	100	100
Urban Kampung	89	96
Ulu Tiram	67	80
Pontian	91	100
Kulai	100	100
Kota Tinggi	42	82

Source : Urban Transport Study, Johor Bahru, 1981.

Table 4.50 : Opinion on Existing and Preferred Distance to Bus-stop

Walking Time	Existing distance (too far) %	Preferred Maximum %
0 - 4 min	11.9	33
5 - 9	29.1	53
10 - 14	18.7	14
15 - 19	14.9	-
20 - 24	13.3	-
25 - 29	4.8	-
more than 30	7.3	-
Total Average	100.0% 15.7 min	100.0% 8.1 min

Source : Urban Transport Study, Johor Bahru, 1981.

Table 4.51 : Opinions on Inconveniences at Bus-Stop

Zone	No Shelter	No Seat	Dirty	Route/ Schedule not shown	Bus doesn't stop	Bus not on time	Long wait
Town Centre	35.5	97.8	64.4	-	-	93.3	8.8
Town Periphery	28.8	44.4	20.0	-	-	42.2	57.7
Low Density Residential	93.3	82.2	37.7	-	6.6	26.7	66.7
Housing Estate	100.0	97.8	-	-	4.4	95.5	11.1
Urban Kampung	53.3	55.5	-	-	-	26.7	93.3
Ulu Tiram	57.7	44.4	6.7	6.7	11.1	53.3	20.0
Pontian	66.1	82.2	20.0	-	4.4	48.9	48.9
Kulai	100.0	97.8	6.7	75.5	-	71.1	100.0
Kota Tinggi	71.1	77.7	37.7	68 9	22.2	62.2	13.3

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.52 : OPINIONS ON WAITING TIME AND PREFERRED INTERVAL

Time	Existing (%)	Prefered Interval (%)
0 - 4 min	3.2	16.4
5 - 9	4.8	52.4
10 - 14	10.8	22.9
15 - 19	20.0	8.3
20 - 24	17.3	-
25 - 29	14.1	-
30+	29.8	-
Total (Average)	100.0 (24.5 min)	100.0 (9.5 min)

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.53 : OPINIONS ON NEW ROUTES

	Percentage Wanting New Routes (A)	By-pass Town Centre (% of A)	In Residential Areas (% of A)
Town Centre	15.5	40	100
Town Periphery	32.2	60	60
Low Density Residential	40.0	60	70
Housing Estate	17.7	40	100
Urban Kampung	95.5	60	80
Ulu Tiram	71.1	-	-
Kulai	8.8	-	-
Kota Tinggi	95.5	-	-

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.54 : OPINIONS ON INCONVENIENCES IN BUSES

Inconvenience	Percentage Yes Home Interview	Bus-stop Interview
One Door	33.3	*
Door Blocked	52.3	*
Passage Way Blocked	13.1	*
Getting In	*	13.2
Getting Out	*	5.4
No Seat	43.4	46.4
Overcrowding	24.0	28.9
Rudeness of Driver/Conductor	14.3	*
Hot	32.9	6.3
Dirty	39.9	12.5
Smoky	7.7	*

* Not Interviewed

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.55 : OPINIONS OF BUS-TYPE AND AIR-CONDITIONING

Bus Type/ Air Conditioning	Percentage Yes
Bigger Bus	72.3
Standee Bus	68.3
Air-Conditioning	-
No fare increase	58.1
10 Cents	25.7
20 Cents	6.1
30 Cents	0.3

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.56 : OPINIONS OF BUS SPEED CHANGES

Speed	Percentage Yes
Faster	72
Same	25
Slower	3

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.57 : OPINIONS ON EXISTING BUS FARE

Fare	Percentage Yes
Too High	8.2
Just Nice	91.8

Source : Urban Transport Study, Johor Bahru, 1981.

TABLE 4.58 : MOST URGENT IMPROVEMENTS

Improvement	Percentage
Nearer Bus-Stops	45.4
Better Bus-Stops	28.6
More Frequent Service	37.7
More Routes	14.7
Bigger Bus	14.8
Standee Bus	11.8
Air-Conditioning	7.4
Faster Bus	23.2

Source : Urban Transport Study, Johor Bahru, 1981.

5.0 SCHOOL AND FACTORY BUS

5.1 Characteristics of School and Factory Buses

School and factory buses possess the following similarities which differ from schedule buses.

- They have the same set of passengers daily.
- The passengers have a common destination (school or factory), ie. many to one trip pattern.
- The passengers' need for transport is concentrated at a point in time (beginning of school session or factory shift, end of school session or factory shift).
- Their routes are not fixed but can be adapted depending on the location of passengers' houses, ie. they offer door-to-door service.

School and factory buses also fill gaps in the scheduled bus service.

- The juxtaposition of schools and residential areas (as shown in Fig. 5.1) cause school trips to be circumferential. Since existing bus routes are radial, school buses shorten the travel time compared with scheduled buses students do not have to take a trip into town and transfer. A similar advantage occurs for factory workers.
- Shift workers who end or begin their shifts between 12.00 midnight and 6.00 am are not served by other means of public transport.

5.2 Advantages

School and factory buses offer the following advantages to school children and factory workers.

- The provision of door-to-door service avoids the need to walk to bus-stops. It is thus more convenient. Attendance is not delayed by the weather and it is safer for shift workers at night and for primary school children.

- From informal interviews, it appears that school and factory buses are more punctual. Waiting time is thus reduced.
- Factory and school buses are generally privately owned thus ensuring better upkeep and are more comfortable.

To the bus operator, there are the following advantages.

- Fares are collected monthly thus ensuring a steady flow of income.
- Conductors are not required to collect fares, saving on labour costs.
- Since passengers use the same vehicle again and again, it is believed that there is a lessen degree of vandalism.

To the employer, the factory bus is an incentive to attract production workers. It also helps to ensure punctuality of workers.

5.3 Drawbacks

Since factory buses pick-up passengers for only one factory and because workers are usually dispersed, it happens that even factories near each other will have their own buses plying perhaps different routes. Thus the member of miles travelled per passenger tend to be higher than scheduled bus services. School buses suffer a similar drawback but is alleviated by the fact they can serve more than one school and there is an informal exchange of passengers.

Because of the longer journey time, some passengers will have to be picked up earlier. They would have to sit out the length of the journey. Thus the saving in waiting time may be negated. Nevertheless for most passengers, it would be fair to say that travel time is lower than by scheduled bus.

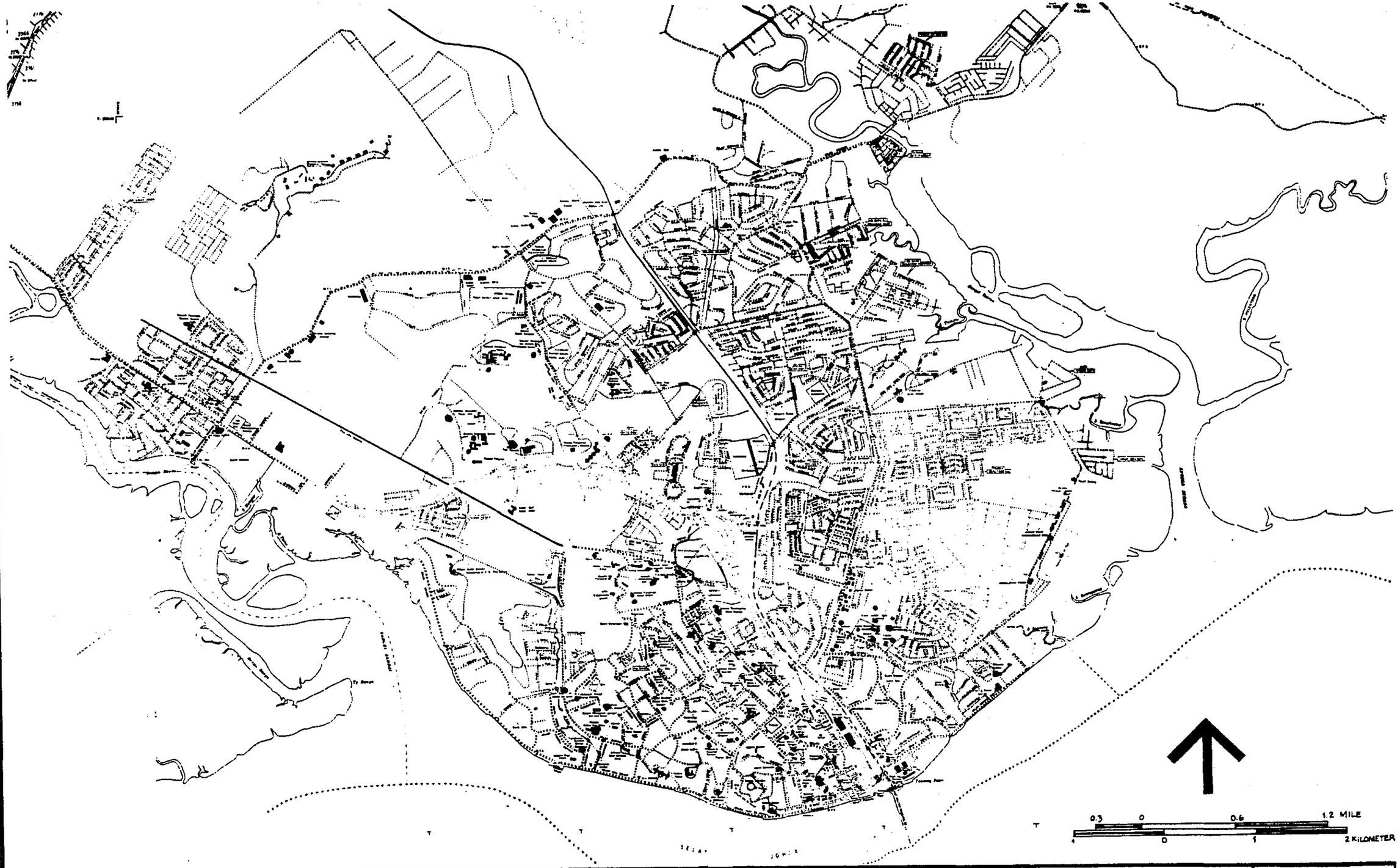
The dispersal of passengers also means that passengers are picked up one at a time, which is not as efficient compared with scheduled buses where bus-stops serve as collection centres.

5.4 Bus Fleet

RIMV Sources reveal a total of 931 school buses in the South Johor area. Of these, 25.4% are Malay-owned while 74.6% are owned by other races.

RIMV Sources reveal a total of 88 factory buses in the South Johor area. Some 18% are Malay-owned while 77% are owned by other races, with the remaining 5% of mixed ownership.

Factory buses tend to be operated by factories or contracted out to private operators while school buses are usually operated by private operators.



URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.	LEGEND:	TITLE: Location of Schools & Residential Areas.	MAP NO. Fig. 5.1

0 TAXI SERVICES

6.1 Taxi Characteristics

In the Study Area two types of taxi services may be distinguished which by regulation operate on a different basis.

Town taxis : which are authorised to collect single payments only, ie. the passengers travel as a group and make one payment.

: they may cruise and collect passengers in town or at the taxi stand.

Inter-Urban taxis : which are authorised to collect separate payments, ie. the passengers pay individually. This is also called the share ride system.

: they are authorised to pick passengers from one taxi stand to another.

Within its authorised area of operations, town taxis have no fixed routes and are thus demand responsive. They provide door-to-door service. This saves one walking trip to or from a bus-stop. It is usual however to walk to local distributors to be able to hail a taxi. Although taxi services are high in the town centre, it may be necessary to walk to a more accessible point if one is in the town periphery or residential areas. However in comparison with buses it may be said that walking and waiting time is much reduced.

These two advantages greatly increases convenience to the user who has baggage and protects the user from rain and sun.

Inter-urban taxis ply fixed routes from station to station. Minor deviations to drop passengers along the way do occur. Passengers are normally not picked up unless there is a vacant seat. On the shorter, out of town services, the number of passengers who board and alight over short distances are believed to be higher than for long-distance taxi.

Pirate taxis are unauthorised private vehicles which operate as taxis. Although no data is available, it is believed that this is prevalent in Johor Bahru.

6.2 Number of Taxis

In 1981, there were 668 town taxis registered in Johor Bahru of which 55% were Malay owned and 45% owned by other races. In Pontian and Kota Tinggi there were 5 and 3 taxis respectively.

The number of town taxis per 1000 population in the three districts are thus:

Johor Bahru : 1.60 per thousand persons.
Pontian : 0.041
Kota Tinggi : 0.027

In 1981, there were 304 inter-urban taxis registered in Johor Bahru, of which 60% were Malay owned. In Pontian and Kota Tinggi, there were 212 and 100 taxis respectively.

The number of inter-urban taxis per 1000 population in the three districts are thus:

Johor Bahru : 0.73 per thousand persons.
Pontian : 1.74
Kota Tinggi : 0.91

The number of town taxis compare favourably with Penang Island (0.68 taxis per thousand population), Province Wellesley (0.29), Singapore (0.70).

6.3 Ownership and Operating Characteristics

6.3.1 Period of Ownership

(Taxi Owner Survey)

6.3.2 Type of Ownership

(Owner-Operator, Rental from individuals, Company or Cooperative).
(Taxi Owner Survey).

6.3.3 Fare System

The fare for the first mile is 70 cents and 30 cents for subsequent half-miles for town taxis.

6.3.4 Revenue and Operating Costs

(Taxi Owner Survey)

6.4 Trip Demand and Characteristics

6.4.1 Trip Demand

(Daily, Annual, Trip Demand rates per week per person)
(Hourly Fluctuation)

(Taxi Owner Survey).
(Home Interview Survey
O-D pattern for taxis)

6.4.2 Origin and Destination

(Taxi Owner Survey).
(Home Interview)

6.4.3 Trip Length

(Taxi Owner Survey)

6.4.4 Frequency Per Taxi

(Taxi Owner Survey).

6.4.5 Occupancy of Taxis

(Taxi Owner Survey).

6.5 User Opinions

Table 6.5 indicates that respondents interviewed at home find taxi fares expensive. There appears to be a significant incidence of not using meters. Picking up of other passengers also appear to be inconvenient to taxi users. From this survey, it appears that hailing for taxis in town is no problem. In residential areas, it is slightly more difficult but does not constitute a major problem.

Table 6.5 : Difficulties using taxis

Difficulty	Percentage Yes	
	Johor Bahru	Regional Towns
Expensive	91.6	78.5
Over-charging (meter not used)	5.7	7.7
Pick up Others	22.2	11.8
Taxi in poor condition	2.2	3.5
Difficulty in hailing : town	2.2	1.7
Diffculty in hailing : suburbs	6.3	3.5

Source : Urban Transport Study, Johor Bahru, 1981.

About 77% of respondents interviewed at home feel that there should be more taxis in town.

About 20% of respondents agreed that there was a need to establish mini-taxis stations in housing estates. About 65% were in favour of dial-a-ride services. Of those who dissented, 78% felt it would

be more expensive, while 22% felt it was still unreliable. The dial-a-ride system needs a widespread use of telephones which is not the case in Johor Bahru.

About 30% would pay an extra 20 cents for air-conditioning in taxis; but this drops to 16% if the increase is 40 cents. There was a total disagreement to air-conditioning if the fare is increased by 60 cents.

About 36% felt that it was not inconvenient to share the taxi with other passengers. Expense was the main reason for this as in Johor Bahru, share-ride is cheaper.

6.6 Problems in Taxis Operations

Several problems are observed in connection with taxi operators.

1. Taxis are not fitted with taximeters, the taximeters do not work, are 'fixed' or taxi drivers do not want to use the meter. Taxi drivers thus overcharge when the meter is not used.

2. Taxis operate on the separate payment scheme. This is especially prevalent on trips towards the town centre.

   From the passengers' point of view, however, this could be advantageous as the fare is cheaper; comparable to bus fares. However the numerous and sudden stops disturb the regular flow of traffic.

3. Inter-urban taxis tout for passengers. This is prohibited by the Road Traffic Ordinance.

4. Town and inter-urban taxis pick up and drop passengers at bus-stops. This is prohibited but may be advantageous to the user who has to wait excessively long for the right bus.

5. Taxis also face competition from pirate taxis. There appears to be little enforcement.

7.0 INTRA-REGIONAL EXPRESS BUS SERVICES

7.1 Express Bus Service Schedule

Express buses differ from stage buses in that they travel from station to station only, without picking up passengers along the route. Within the Study Area, there is only one express bus route ie. from Pontian to Johor Bahru, operated by Pontian Express and Syarikat Kenderaan Melayu Pontian. The schedule is as shown in Table 7.1 below. There is a total of 24 services on weekdays and 29 on weekends.

TABLE 7.1 : SCHEDULE OF JOHOR BAHRU - PONTIAN EXPRESS BUS SERVICES

Time	Number of Trips departing from Johor Bahru	
	Pontian Express	SKMP
7 - 8	1	1
8 - 9	1	1
9 - 10	1	1
10 - 11	1	1
11 - 12	1	1
12 - 1	1	1
1 - 2	2	2
2 - 3	-	1
3 - 4	1	1
4 - 5	1	1
5 - 6	1	1
6 - 7	1 (Sat only)	-
7 - 8	1 (Sat only)	-
8 - 9	1 (Sat only)	-

Source : Urban Transport Study, Johor Bahru, 1981.

7.2 Travel Demand

A one-day survey (on a Monday) revealed the following occupancies on the outward bound service (Johor Bahru to Pontian). Since the services are operated by full-size buses, the occupancy rate is less than half.

TABLE 7.2 : OCCUPANCY RATE OF JOHOR BAHRU - PONTIAN EXPRESS BUS SERVICES

Departure Time	Occupancy (Number of Passengers)	
	Monday	Tuesday
7.30 am	10	10
8.20 am	25	15
9.20 am	20	7
10.10 am	15	20
11.10 am	10	7
12.00 noon	7	12
1.00 pm	5	10
1.50 pm	10	10
2.50 pm	26	25
3.40 pm	38	30
4.40 pm	40	34
5.30 pm	20	40
Total	226	220
Average	19 per trip	18 per trip

Source: Urban Transport Study, Johor Bahru, 1981.

7.3 Service Levels and Fare

Travel time between Johor Bahru and Pontian by the express bus is about 50 minutes or a speed of about 30 mph (50 kph) over the distance of 37 miles (60 km). This compares with a travel time of 85 minutes or a speed of about 25 mph (40 kph) by scheduled bus.

The frequency of about once every hour each way compares with four by scheduled bus. Though travel time is shorter by 38 minutes, the frequency of service of the express is only one fourth that of scheduled services. The ratio may however be lessened by the fact that scheduled buses do not stick to schedule.

The fare by express bus is $1.90 which is only 10 cents higher than the fare of $1.80 by scheduled bus.

7.4 Unit Operating Statistics

Operating statistics were available only for Syarikat Kenderaan Melayu and is shown in Table 7.3.

The revenue per mile of 61 cents in 1979 and 105 cents in 1980 is lower than the lowest for scheduled bus services in Johor Bahru (112 in 1979, 121 in 1980) and even lower compared with average inter-regional express rate of 174 cents per bus mile.

The cost per mile of 96 cents in 1980 is much lower than the average for urban scheduled services (121 cents in 1980) and inter-regional express services (126 cents) but higher than for the rural feeder services (78 cents).

The cost of borrowed funds at 7.7 cents in 1980 appear to be high in Syarikat Kenderaan Melayu Pontian, but lower than Hosni Tours (11.7 cents) which operates inter-regional express services and Hakkim (20.4 cents) which operates urban scheduled services.

TABLE 7.3 : OPERATING STATISTICS OF SYARIKAT KENDERAAN MELAYU PONTIAN

	1979	1980
Bus Milege Operated (thousand miles)	261.6	261.3
Passengers Carried (thousand)	131.6	158.5
Gross Revenue (thousand dollars)	159.3	275.5
Operating Costs (thousand dollars)	138.7	251.8
Revenue per mile (cents)	60.9	105.5
Operating Cost per mile (Cents)	53.0	96.4
Revenue per Passenger (Cents)	121	173.8
Operating Profit per mile (including interest)	7.9	9.1
Interest per mile (including interest)	3.8	7.7

Source : Urban Transport Study, Johor Bahru, 1981.

8.0 INTER-REGIONAL TRANSPORT MODES : COMPARATIVE ADVANTAGE

8.1 Modes

The following modes are available for inter-regional travel to the north : train, plane and express buses. To Singapore, train, scheduled bus and express bus services are availabe.

A comparison of fare and travel time given in Table 8.1 below :

Table 8.1 : Fare Comparison of Inter-regional Modes towards the North

Destination	Plane	Express Bus	Train			
			Express (NAC)	Express (N/AC)	Class 2	Class 3
Seremban	-		$21	$12.60	$15	$ 9.40
Kuala Lumpur	$ 55		$25	$15	$18.90	$11.90
Ipoh	$100		$35	$21.10	$28.90	$18.10
Penang	$130		$45	$27	$38.30	$24

Source : MAS, KTM and bus companies

Table 8.2 : Travel Time Comparison of Inter-regional Modes towards the North

Destination	Plane	Express Bus	Train	
			Express (AC)	Ordinary
Seremban	-	5.5	5.0	8.5
Kuala Lumpur	0.5	6.5	6	10
Ipoh	1.25*	5.3	4.35	8
Penang	1.25*	10	14	20*

* excluding transit time

Source : Urban Transport Study, Johor Bahru, 1981.

8.2 Travel Time

The distinct advantage of travelling by air is the saving in travel time. Between Johor Bahru town and Malacca town the saving in time is not very

INTER - REGIONAL

significant (2.5 hrs. by air and 3.5 hrs by express bus), when travel time to Senai Airport and to Malacca airport to town is included. However even by the same consideration, travel time is halved between Johor Bahru and Kuala Lumpur compared with express buses or by train. Savings in travel time is more significant for trips for Ipoh, Penang and northwards.

Travel time by express bus and express train is about the same to Kuala Lumpur. The difference is more significant for destination northwards. To Penang, there is a saving of 4 hours by express bus.

8.3 Travel Cost

Including transport cost to and from airports, the cost of travel by air to Kuala Lumpur town centre is more than 3 times the time by bus or train.

8.4. Travel Demands

Travel demand to the north by the various modes of transport is shown in Fig. 8.4 and to Singapore in Fig. 8.5.

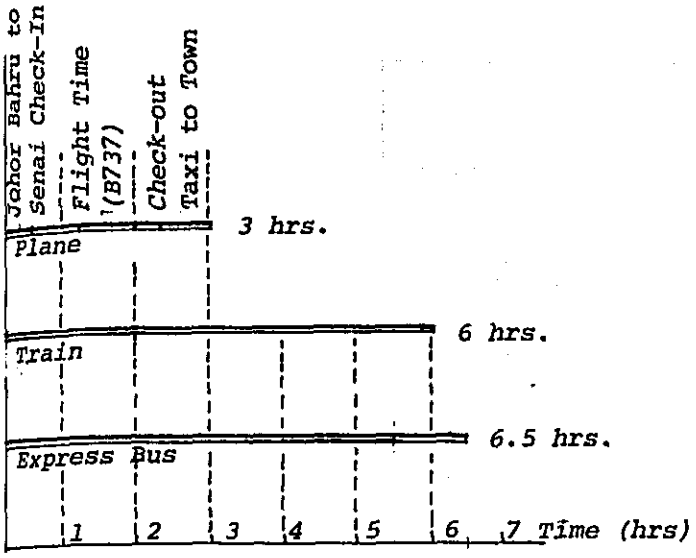


Fig. 8.1 : Travel Time to Kuala Lumpur

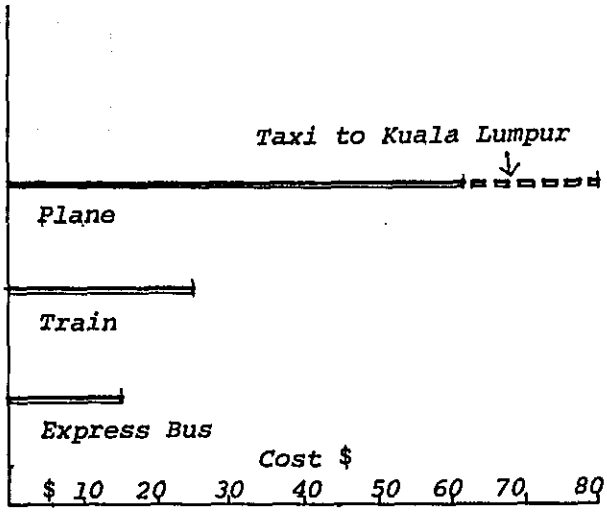


Fig. 8.2 : Travel Cost to Kuala Lumpur

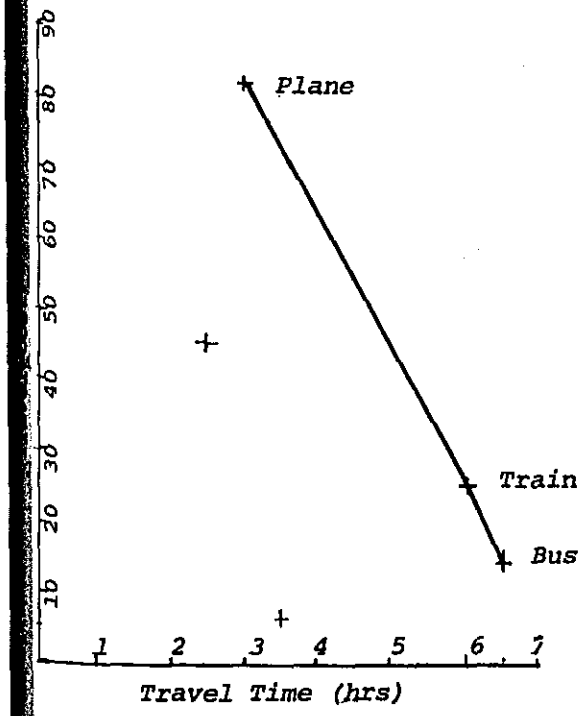


Fig. 8.3 : Travel Time Cost Comparison to Kuala Lumpur

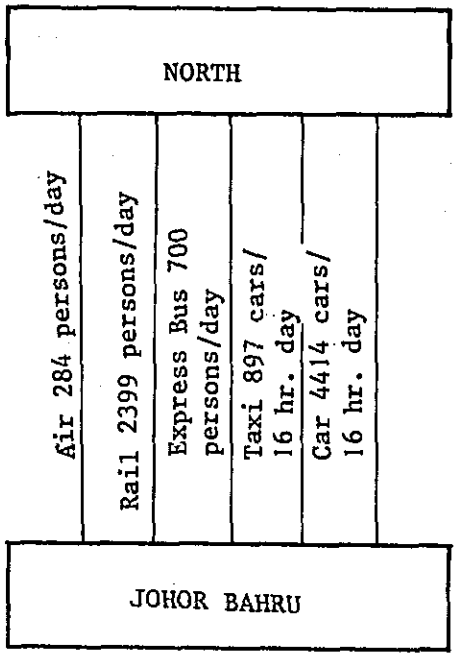


Fig. 8.4 : Two-way Travel Demand to the North

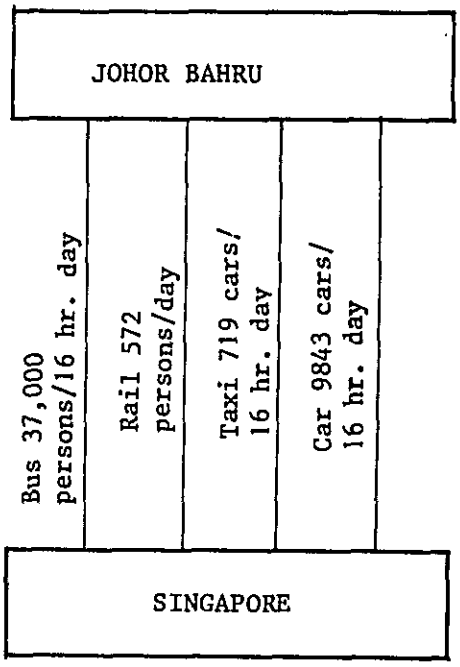


Fig. 8.5 : Two-way Travel Demand to Singapore

9. INTER-REGIONAL EXPRESS AND SCHEDULED BUS SERVICES

9.1 Services and Schedule of Express Services

Inter-regional express bus services serve all the major towns in Peninsular Malaysia. Express buses differ from scheduled buses in that they cannot pick up passengers en-route. They are however required to ply fixed routes. Services on longer distances are normally air-conditioned. Shorter distance services(eg. Muar, Batu Pahat) are not air-conditioned.

The daily schedule of inter-regional express services is shown in Table 9.1. There are 29 services per day northwards to destinations outside the state, 6 of which are to Kuala Lumpur. The frequency of service within the state is higher : 9 each to Muar and Batu Pahat, 6 to Kluang and 2 to Mersing. There are 315 services to Singapore at 7 minute intervals.

These services are operated by 9 companies of which only Hosni Express, Maju Express, Damai Express and South-east Express operate from Johor Bahru.

9.2 Travel Demand

Travel demand on inter-regional express services is shown in Table 9.2

The main demand for express services is to Singapore. On weekends, some 12,700 passengers are transported and weekdays 10,000.

Northwards the main destination is Kuala Lumpur with 170 passengers on weekends. Weekday's traffic is considerably lower. Kuantan and Rompin are also important destinations (100 and 90 respectively on weekends. Weekday Traffic however is low, especially to Rompin. The state capitals further north (Penang, Kota Bahru) also draw a significant number of passengers.

Table 9.1: Schedule of Inter-regional Express Bus Services

Primary Destination	Secondary Destinations	Departures Per. Day	Departure Time	Company
A Alor Star	Taiping Kuala Kangsar	1	9.00 p.m.	Mara
Butterworth	-	1	9.00 p.m.	Mara
	Ipoh	1	7.30 p.m.	Hosni
Ipoh	-	2	9.00 p.m.(2)	Mara
Kampar	-	1	9.00 p.m.	Aneka
Kuala Lumpur			9.00 a.m. 1.00 p.m.(2) 10.00 p.m.	Mara
			8.30 a.m. 9.45 P.m.	Aneka
Seremban	-	3	9.00 a.m. 1.00 p.m. 10.00 p.m.	Mara
B Kota Bharu	-	4	8.30 p.m. 7.30 p.m. 8.30 p.m.	Mara(SKMK)
Kuala Trengganu	-	2	9.30 a.m 9.00 p.m.	Mara Express (SIS)
Kuantan	-	4	8.30 a.m. 10.30 a.m. 11.00 a.m. 11.00 p.m.	Mara Express (SIS)
Rompin	-	4	10.30 a.m. 11.00 a.m. 10.25 p.m. 11.00 p.m.	(SIS)
C Muar	-	9	8.00 a.m. 9.00 a.m. 10.00 a.m. 12.00 noon 1.00 p.m. 2.00 p.m. 4.00 p.m. 5.00 p.m. 6.00 p.m.	Maju Express
Batu Pahat	-	9	8.00 a.m. 9.00 a.m. 11.00 a.m. 1.00 p.m. 2.00 p.m. 3.00 p.m. 4.00 p.m. 5.00 p.m. 6.00 p.m.	Hasry Express
Kluang	-	6	8.00 a.m. 9.00 a.m. 12.00 noon 2.30 p.m. 5.00 p.m. 7.30 p.m.	Bakti
Mersing	-	2	8.30 a.m. 2.00 p.m.	South-east Express
Air Hitam	-	4	7.30 a.m.(2) 8.30 a.m. 12.30 p.m.(2) 1.00 p.m.	Damai Express
Singapore	-	315	6.30 a.m.to 11.20 p.m. every 7 mins	Singapore-Johor Bahru Express

(Express Services to Pontian in Chapter 7)

Source: Urban Transport Study, Johor Bahru, 1981.

Table 9.2: Inter-regional Traffic Volume and Occupancy by Express Bus.

Destinations	Sunday Persons/day	Average Occupancy	Weekdays Persons/day	Average Occupancy
Alor Star	13	13.0	12.5	15
Butterworth	55	30.5	38.5	25.3
Taiping	6	3.0	1.5	-
Kuala Kangsar	-	-	1.0	-
Ipoh	26	13.3	13.5	7.5
Kampar	19	19.0	7.0	7.0
Kuala Lumpur	169	33.0	85.5	21.4
Seremban	-	-	-	-
Kota Baru	69	17.3	40.8	13.6
Kuala Trengganu	36	18.0	38.5	19.3
Kuantan	98	24.5	51.0	10.2
Rompin	89	29.7	4.0	4.0
Muar	203	25.4	132.0	14.7
Batu Pahat	199	22.1	152	19.1
Kluang	147	24.5	152	25.0
Mersing	50	25.0	45	22.5
Singapore	12,678	40.3	9,922	31.5

Source: Urban Transport Study, Johor Bahru, 1981.

Table 9.3: Past Trend of Passengers carried by Inter-regional Express Bus

Company	Destination	1976	1977	1978	1979	1980
Hosni	Butterworth					14,400
South-east	Mersing	36,178	39,129	40,471	42,239	48,181
Damai	Air Hitam					30,530

Source: Urban Transport Study, Johor Bahru, 1981.

Data collected from the express bus companies operating in Johor Bahru is insufficient to analyse past-trends. Data from the Mersing route indicates growth vary from 2.6% p.a. to 14% p.a. or an average of 7% growth per annum.

Occupancy on the J.B.- Singapore sector (40 passengers on weekends and 31 on weekdays) is the highest. Occupancy on the in-state sectors are quite high at about 25 passengers per bus. Further north, the occupancies are high to the large population centres (Butterworth 30 passengers on weekends, 20 on weekdays; Kuala Lumpur 34 passengers on weekends, 21 on weekdays).

9.3 Travel Time and Cost

Travel Time and Cost is shown in Table 9.4. This is self-explanatory :

Table 9.4: Travel Time and Cost by Express Bus

Destination	Fare (air con)	Fare (non aircon)	Travel Time
Butterworth	$ 26	-	12 hrs
Ipoh	$ 22	$ 16	10 hrs
Kuala Lumpur	$ 14	-	7 hrs
Kota Bahru	$ 27	$ 16	12 hrs
Kuala Trengganu	$ 17	$ 8.50	10 hrs
Kuantan	$ 14	$ 7	6 hrs
Muar	-	$ 5.50	3½ hrs
Batu Pahat	$ 5.50	$ 4	2½ hrs
Masai	-	$ 4.25	3 hrs
Kluang	-	$ 4	2 hrs
Singapore	$ 1	$ 0.80	3/4 hrs

Source: Urban Transport Study, Johor Bahru, 1981.

9.4 Characteristics of Express Bus Companies

The express bus companies based in Johor Bahru are small (Table 9.5). Hosni Tours which provide services to Butterworth has 10 buses, South-East 2, Damai and Maju only 2 and 3 buses respectively.

The buses are usually new because the companies are new. Damai Express started operation only in 1981 (Table 9.6). The buses have a capacity of around 40 passengers (Table 9.7).

Employment in express bus companies is small (Table 9.8) corresponding to the number of buses. Employment ranges from 7 to 68. Hosni employs a good racial mix of employees while Damai's employees is exclusively Malay. Most of South-east's employees are Chinese (Table 9.9). The working hours and salaries of employees is shown in Table 9.10.

Operating revenue and cost are shown in Table 9.11 and capital structure in Table 9.12. The profit margin is 1.45% for Hosni Tours and 24% for South-east Express. The rate of return on investment is 9.7% for Hosni and 102% for South-east Express.

Table 9.5: Fleet Size

Company	1976	1977	1978	1979	1980	1981
Hosni	-	-	-	5	7	10
South-east	2	2	2	2	2	2
Damai	-	-	-	-	-	3
Maju	15	17	19	25	25	27

Source: Urban Transport Study, Johor Bahru, 1981.

Table 9.6: Age of Fleet (October 1981)

Company	0-1 yr	1-2 yr	2-3 yr	3-4 yr
Hosni	4	6	-	-
South-east	-	-	2	-
Damai	3	-	-	-
Maju	2	6	2	2

Source: Urban Transport Study, Johor Bahru, 1981

Table 9.7: Bus Capacity

Company	20-30	30-40	40-50
Hosni	7	-	-
South-east	-	2	-
Damai	-	-	3
Maju	1	9	9

Source: Urban Transport Study, Johor Bahru, 1981.

Table 9.8: Employment in Express Bus Companies 1980/81

Company	Driver	Conductor	Maintenance	Admin.	Others	Total
Hosni	14	1	2	3	16	36
South-east	2	3	-	2	-	7
Damai	5	3	-	3	2	13
Maju	33	10	5	19	1	68
SKMP	5	6	-	-	5	15

Source: Urban Transport Study, Johor Bahru, 1981

Table 9.9: Racial Composition of Company Employees 1980/81

Company	Malay	Chinese	Indians	Others	Total
Hosni	20	12	2	-	36
South-east	-	6	1	-	7
Damai	13	-	-	-	13
Maju	65	1	2	-	68
SKMP	11	1	3	-	15

Source: Urban Transport Study, Johor Bahru, 1981.

Table 9.10: Working Hours and Wages of Employees (per month), 1981.

Company	Driver		Conductor		Maintenance		Admin		Others	
	Hours	Wages	Hours	Wages	Hours	Wages	Hours	Wages	Hours	Wages
Hosni	330	$900	240	$300	255	$500	255	$500	255	$300
South-east	208	$480	208	$480	-	-	208	$780	208	$410
Damai	208	$345	208	$250	-	-	208	$250	208	$200
Maju	208	$345	208	-	-	-	208	-	-	-
SKMP	238	$395	238	$239	-	-	-	-	238	$210

Source: Urban Transport Study, Johor Bahru, 1981.

Table 9.11: Operating Revenue & Costs Express Bus Companies

	Hosni	South-east	Damai	Maju
Revenue	$1,111,428	184,528	91,600	1,358,946.25
Express		139,462		244,319
Fuel/Oil	207,755	16,798		72,510
Tyres		11,897		135,065
Maintenance		9,974		48,612
Licence		3,552		52,850
Insurance	66,221	4,592		
Wages	129,052	43,214		70,870
Depreciation	197,423	26,076		
Interest				34,867
Short term		-		
Long term	78,875	-		
Others	234,131	23,359		
Profit Margin	16,081	45,066	-	115,997
	1.45%	24.4%		8.54%
Return on Investment	9.7%	102%	-	15.57%

Source: Urban Transport Study, Johor Bahru, 1981.

Table 9.12: Capital Structure of Express Bus Companies

	Hosni	South-east	Damai	Maju
Authorised	$ 500,000	$ 100,000	$ 120,000	5,000,000
Issued	$ 165,000	$ 44,200	?	745,003
Malay portion	100%	nil	100%	100%
Long term loans	$ 763,357	nil	$ 200,000	300,000

Source: Urban Transport Study, Johor Bahru, 1981.

9.5 Unit Operating Statistics

The average revenue per mile of 174 cents per mile in 1980 is higher than for urban scheduled services (121 cents same year) and intra-regional express services (105 cents).

The average operating cost per mile of 126 cents per mile 1980 is higher than for urban scheduled services (121 cents), intra-regional express services (96 cents) and rural feeder services (78 cents)

Table 9.13: Inter-regional Express Statistics 1980/1981

	Bus Mileage Operated ('000 miles)	Passengers carried ('000)	Gross Revenue ($'000)	Operating Costs ($'000)	Profit (Loss) ($ '000)	Revenue Per Mile (cents)	Cost Per Mile (cents)	Passenger Per Mile (Persons)	Fare Per Passenger ($ ¢)	Interest Per Mile (cents)
Hosni	672.7	57.6	$1111.4	1016.4	95.0	165.2	151.1	0.09	19.30	11.7
South-east	139.2	48.2	$184.5	139.4	45.1	132.5	100.1	0.35	3.82	-
Damai	41.0	30.5	$ 91.6	-	-	223.4	-	0.74	3.0	-
Maju	-	-	-	-	-	-	-	-	-	-

Source: Urban Transport Study, Johor Bahru, 1981.

9.6 Scheduled Services To Singapore

This service operates between 6am and 12 midnight at 5 minutes intervals or 216 return services a day.

9.7 Characteristics of Causeway Bus Users and Trips (includes express, scheduled and other buses)

The age and occupation of visitors to Singapore who cross the causeway by bus is shown in Tables 9.14 and 9.15.

Table 9.14 : Age Composition of Causeway Bus Passengers

Age	Percentage
less than 20	14.1
20 to 29	42.7
30 to 39	19.6
40 to 49	18.6
50 and above	5.0

Source : Urban Transport Study, Johor Bahru, 1981.

Table 9.15 : Occupations of Causeway Bus Passengers

Occupations	Percentage
Admin and Managerial	0.5
Professional and Technical	1.4
Clerical and related	6.4
Sales	3.6
Service	12.3
Factory, Construction, Transport	34.6
Agriculture, Animal Husbandry	0.9
Student	30.9
Housewife	4.1

Source : Urban Transport Study, Johor Bahru, 1981.

Within the Study Area, Johor Bahru is the origin or destination of 73% of the trips with Pontian 10%. Trips to Kulai, Kota Tinggi and Masai are at 5%, 3.2% and 2.7% respectively.

Table 9.16 : Destination in Study Area

Destination	Percentage
Johor Bahru	72.7
Pontian	10.5
Kota Tinggi	2.7
Kulai	5.0
Senai	-
Masai	3.2
Others	5.9

Source : Urban Transport Study, Johor Bahru, 1981.

Some 40% of the bus trips to Singapore are to work with 45% for shopping. Social reasons account for 7.5%. Other reasons are of minor importance.

Table 9.17 : Purpose of Bus-Users who visit Singapore

Purpose	Percentage (including home)	Percentage (excluding home)
Work	26.8	40.3
School	1.4	2.1
Business	1.4	2.1
Home	33.6	-
Shopping	29.6	44.5
Recreation	1.4	2.1
Religious	-	-
Social	5.0	7.5
Others	0.9	1.4

Source : Urban Transport Study, Johor Bahru, 1981.

From 16 hour counts on a Sunday and Monday, the number of bus passengers between Singapore and Johor Bahru is estimated to be 17,200 one way per day on weekends and 16,500 one way per day on weekdays.

The fluctuation of bus passengers crossing the causeway is shown in Table 9.18 and Fig. 9.1.

Table 9.18 : Bus Passenger Movements at Causeway

	Sunday	Monday
6 - 7 am	291	220
7 - 8	848	502
8 - 9	1,060	640
9 - 10	1,164	673
10 - 11	1,779	510
11 - 12 noon	1,088	681
12 - 1	1,164	805
1 - 2	947	658
2 - 3	832	727
3 - 4	1,188	1,826
4 - 5	1,081	1,226
5 - 6	1,094	1,852
6 - 7	1,138	2,226
7 - 8	1,023	1,476
8 - 9	303	1,812
9 - 10 pm	2,199	634

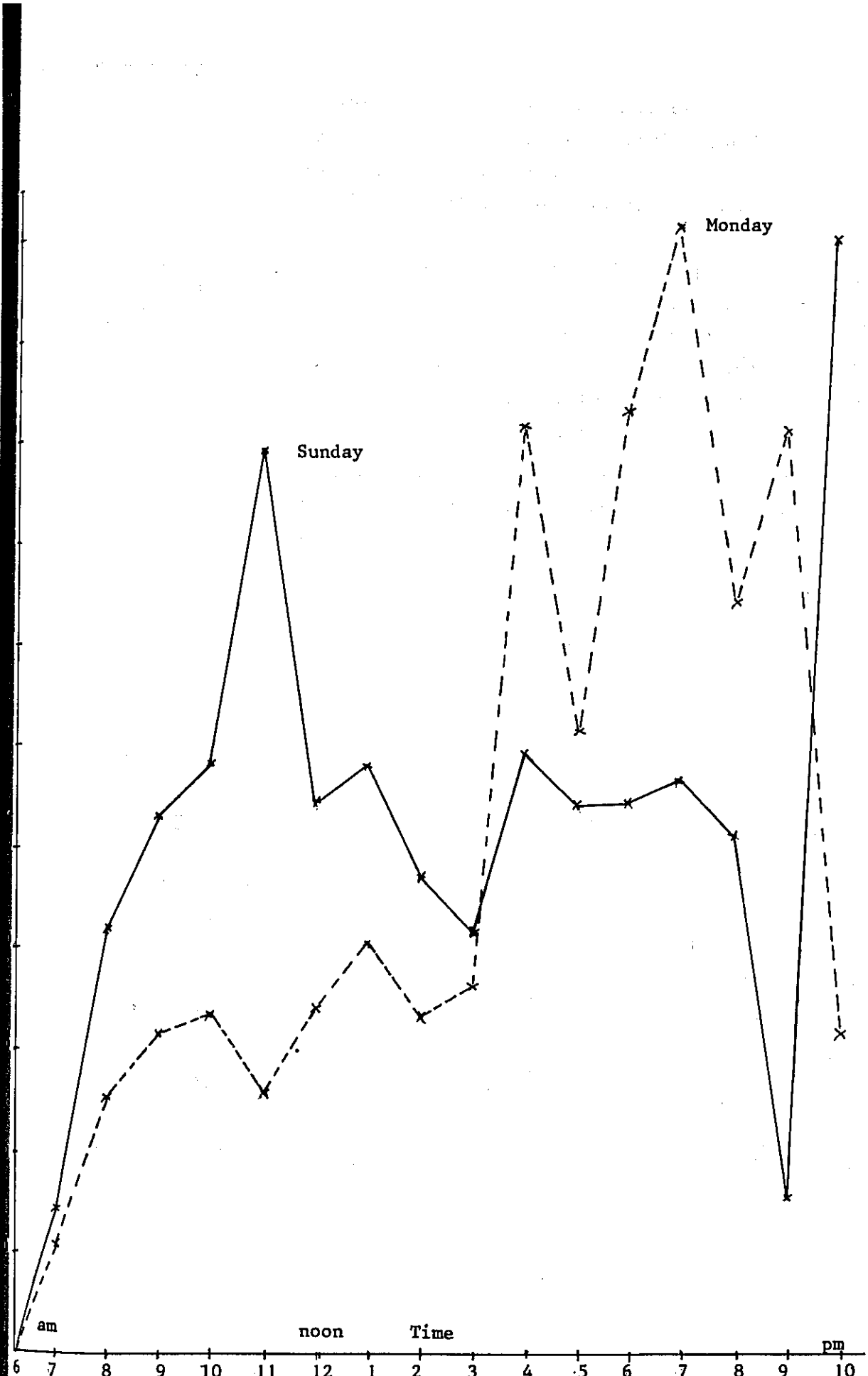


Fig. 9.1 : Bus Passenger Movements at Causeway from Singapore

10.0 RAILWAY SERVICES

This section describes passenger and trip characteristics of passengers arriving and departing from Johor Bahru Station. Freight Services is described in other reports of this study.

10.1 The Railway Services In Peninsular Malaysia

The network consists of three major sections. The Padang Besar - Kuala Lumpur and Kuala Lumpur - Singapore sections run the length of the more developed west coast. The Pasir Mas-Gemas section links the west coast with the east. There is a total of 1035 route-miles covered by 1340 miles of tracks.

For passenger services, there are two general types of service: express and ordinary. Express Rakyat and KTM trains stop at a few main stations and are faster. Train fares are given in Appendix.

Passenger traffic on Malayan Railway services have grown slowly and on the last few years, erratically as shown in the Table 10.1 below.

Table 10.1: Growth of Rail Passenger Traffic, Malayan Railways 1972-1979

Year	Number of Passengers('000)	Passenger Km million	Average trip length (Km)	Revenue ($ million)
1972	5,748	729	127	24.2
1973	5,668	798	141	28.1
1974	5,967	953	159	33.3
1975	6,070	1,014	167	35.5
1976	6,400	1,145	179	39.7
1977	6,389	1,273	199	45.3
1978	5,998	1,269	211	45.9
1979	6,243	1,372	220	50.3
Average Growth % per yr	1.2%	9.4%	11.6%	13.5%

Source: Yearbook of Transport statistics, 1980

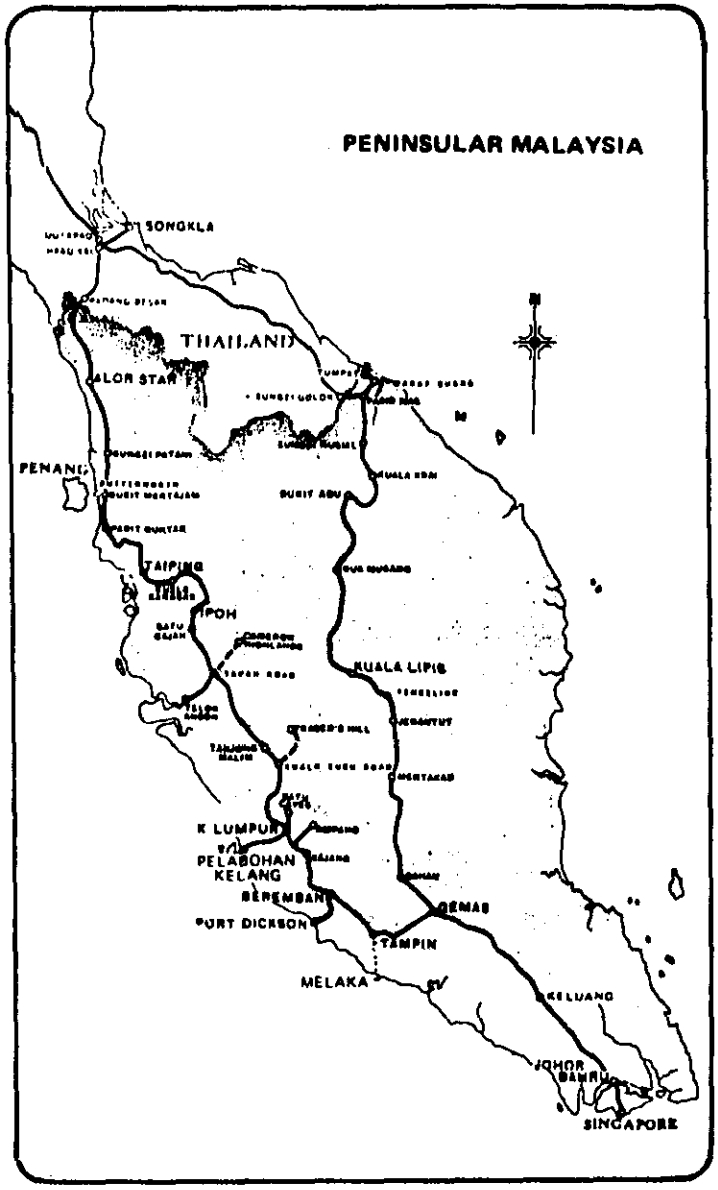


Fig 10.1: Railway Network In Peninsular Malaysia

These data indicate that although the passenger growth is low and erratic, the revenue from passenger rail services has increased steadily as a result of longer journey. The average journey length in 1979 is slightly more than the distance from Johor Bahru to Gemas, reflecting it. .mportance as a inter-regional mode of transport.

10.2 The Railway Services In The Study Area

The study area is bisected by the single line railway which cuts through the town and crosses the causeway into Singapore. Besides the main station at Johor Bahru, there are the smaller stations at Sedenak, Kulai, Tampoi and Kempas.

The following services are available in the study Area. From Kuala Lumpur, there are services northwards and from Gemas Services to the East Coast.

Table 10.2a: Rail Services at Johor Bahru

KUALA LUMPUR - SINGAPORE						
From	KTM Express	Express	People's Express	Ordinary	Express	Ordinary
Kuala Lumpur	0700	0900	1515	2015	2200	
Kajang	-	0938	-	2054	-	
Seremban	0807	1025	1627	2142	2326	
Tampin	0844	1117	1712	2237	0019	
Gemas	-	1224	-	2345	0124	
Gemas	-	1235	-	2355	0200	0745
Segamat	0951	1302	1828	0024	0235	0810
Kluang	1107	1449	1950	0235	0417	0947
Kulai	-	1617	2043	0343	0522	1051
J. Bahru	1220	1648	2112	0415	0554	1121
Singapore	1245	1730	2140	0505	0640	1200

Source : Malayan Railways.

Table 10.2b : Rail Services at Johor Bahru

SINGAPORE - KUALA LUMPUR						
To	People's Express Express		KTM Express	Ordinary	Express	Ordinary
Kuala Lumpur	1430	1725	1900	0505	0640	
Kajang	-	1647	-	0427	0602	
Seremban	1318	1547	1753	0335	0508	
Tampin	1233	1453	1715	0230	0408	
Gemas	-	1350	-	0130	0310	
Gemas	-	1335	-	0120	0229	1755
Segamat	1123	1258	1610	0039	0155	1730
Kluang	0952	1105	1452	2250	0014	1554
Kulai	-	0956	-	2149	-	1500
J. Bahru	0830	0915	1341	2032	2232	1427
Singapore	0800	0845	1315	2000	2200	1400

Source : Malayan Railways.

3. Travel Demand

Based on data from 1978-1980, the number of passengers boarding and alighting at Johor Bahru appears to be growing rapidly as indicated by Table 10.3 below.

Table 10.3: Number of Passengers Boarding & Alighting at Johor Bahru 1978-1980 ('000)

Year	Boarding Number	Alighting Number	Total Number	% growth
1978	367.6	371.5	739.1	
1979	459.3	460.7	920.0	24.5%
1980	524.1	560.6	1084.7	19.9%

Data: Malayan Railways; MR O-D Passenger Statistics

The distribution of origin of arriving trips and destination of departing trips for 1980 is shown by desire lines in Figs 10.2 and 10.3. The predominant flows appear to be to and from Kuala Lumpur, Kluang and Singapore which together form more than 54% of the total arrivals and almost 62% of departures.

The growth of passenger traffic between these centres and Johor Bahru is presented in Tables 10.4 and 10.5 below. From these data the traffic to and from Kuala Lumpur appear to be increasing but at a decreasing rate. Traffic to Kluang seem to be increasing at a decreasing rate but traffic from there appear to be increasing more rapidly. In 1980, the traffic from Singapore almost doubled that of the year before.

Table 10.4: Growth of Passengers To and From Kuala Lumpur, Kluang, Singapore 1978-1980 ('000)

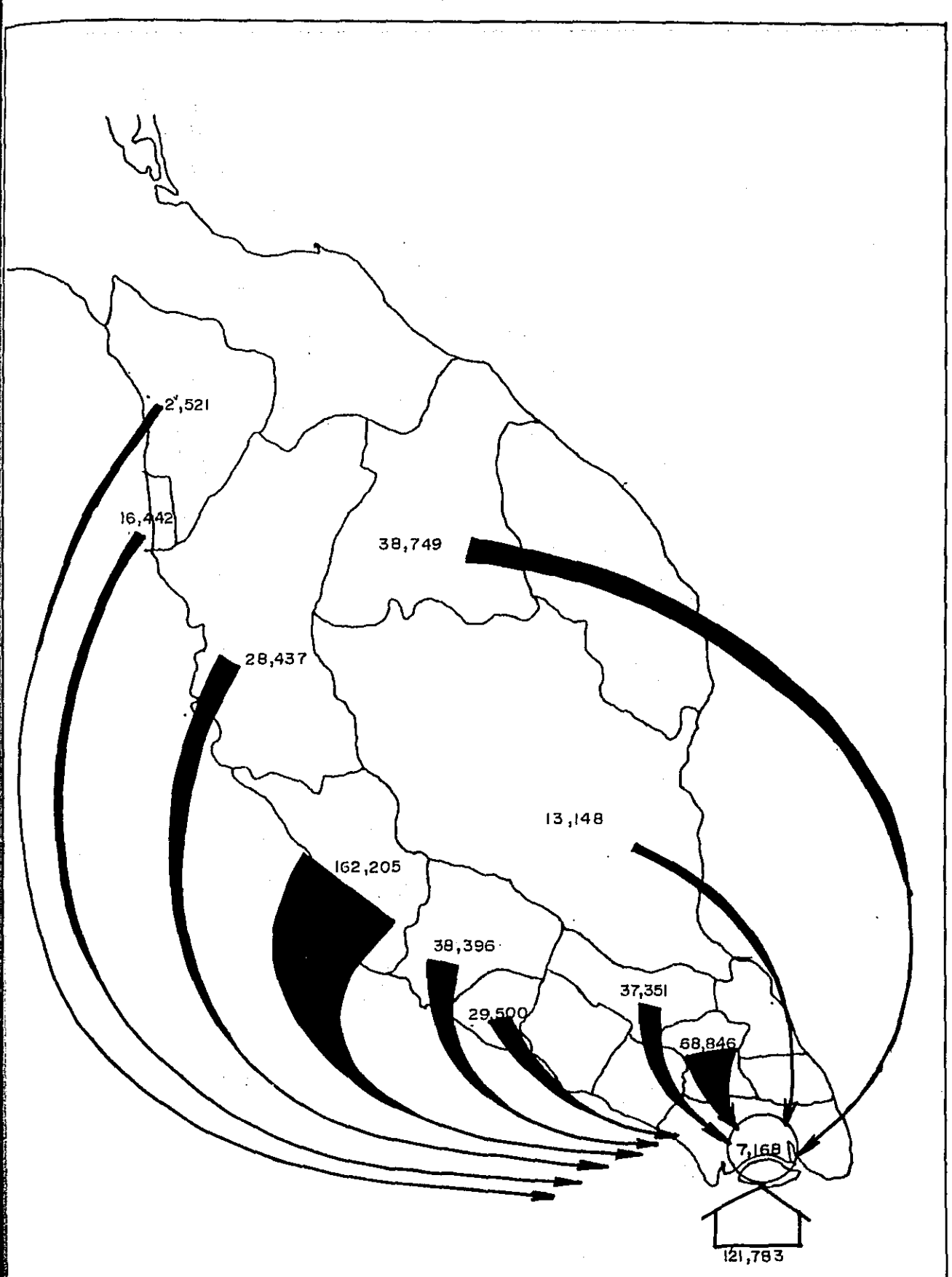
Year	Kuala Lumpur		Kluang		Singapore	
	To	From	To	From	To	From
1978	124.9	122.3	59.8	49.9	53.1	49.9
1979	144.6	144.8	72.0	57.7	75.0	63.2
1980	156.6	162.0	80.8	68.8	86.9	121.8

Source : Malayan Railways.

Table 10.5: Percentage Growth of Passengers To and From Kuala Lumpur, Kluang Singapore 1978-1980

Year	Kuala Lumpur		Kluang		Singapore	
	To	From	To	From	To	From
1978-79	15.8%	18.8%	20.4%	15.6%	41.2%	26.6%
1979-80	8.3%	11.8%	12.2%	19.2%	15.6%	92.7%

Source : Malayan Railways.



URBAN TRANSPORT MASTER PLAN STUDY JOHOR BAHRU CONURBATION; MALAYSIA.

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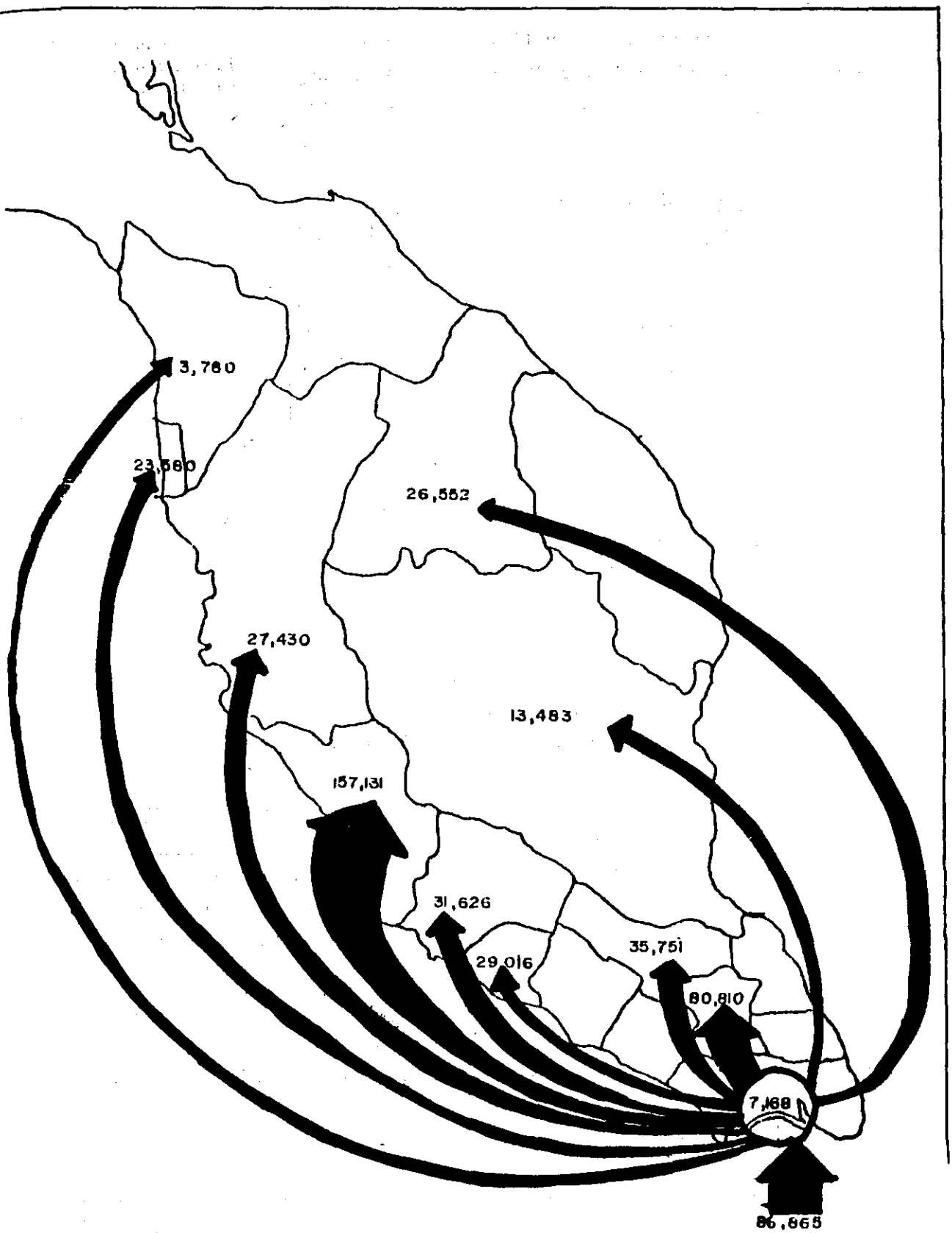
Title: ORIGIN OF TRAIN TRIPS ARRIVING IN JOHOR BAHRU, 1980.

map no.

fig. 10.2



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DESTINATION OF TRAIN TRIPS DEPARTING JOHOR BAHRU, 1981.

Map No.

Fig. 10.3

10.3 Personal Characteristics Of Rail Users

Some 78% of rail users are in the 20-39 age group. Users below 20 and above 50 constitute only 11%. Some 51% of the passengers interviewed were male and 49% female.

Table 10.6: Age Distribution of Rail Users

Age	Percentage
less than 20	8%
20 - 29	54%
30 - 39	24%
40 - 49	11%
50 and above	3%
Total	100%

Source : Urban Transport Study, Johor Bahru, 1981.

The occupational distribution of express and ordinary train passengers is shown in Table 10.7. The percentage in the administrative, managerial, professional & technical sector is very low. Other sectors are evenly represented except agriculture, animal husbandry and fishing which is not recorded in the sample and students who account for only 4% of ordinary train users.

Table 10.7: Occupation of Train Users

Occupation	Express (%)	Ordinary (%)
Administrative + Managerial	-	4
Professional & Technical	6	2
Clerical & related	14	10
Sales	10	14
Service	14	20
Factory, Construction, Transport,	18	6
Agriculture,Animal Husbandry,Fishing	-	-
Student	-	4
Housewife	20	20
Others	18	20
Total	100	100

Source : Urban Transport Study, Johor Bahru, 1981.

10.4 Impact On Urban Transport

The impact of passengers arriving at and departing from the Railway Station is important because it is located in the Town centre. Its traffic flow thus affects the use of the various modes of public and private transport in town.

10.4.1 Origin and Destinations of Trips (in Study Area)

About 73% of the passengers of express trains and 67% of ordinary trains depart from Johor Bahru, Kota Tinggi and Pontian being regional centres contribute significant percentages of rail users. Passengers in the "other" category originate from smaller towns and villages.

Arriving passengers are mainly going to Johor Bahru (Express 35%, ordinary 65%), Pontian (30% and 10% respectively) and Kota Tinggi (20% and 5% respectively).

It can be discerned that for express services passengers are drawn from a larger catchment area than for ordinary trains.

Table 10.8: Origin of Departing Passengers

Place	Express Train	Ordinary Train
Johor Bahru	73.3	66.7
Pontian	13.3	-
Kota Tinggi	3.2	6.7
Kulai	-	3.3
Senai	-	3.3
Others	13.2	20.0
Total	100.0	100.0

Source: Urban Transport Study, Johor Bahru, 1981.

Table 10.9: Destination of Arriving Passengers

Place	Express Train	Ordinary Train
Johor Bahru	35.0	65.0
Pontian	30.0	10.0
Kota Tinggi	20.0	5.0
Kulai	10.0	-
Senai	-	5.0
Others	5.0	15.0
Total	100.0	100.0

Source : Urban Transport Study, Johor Bahru, 1981.

10.4.2 Mode of Transport to/from Railway Station

Bus and taxi appear to be the most popular mode of transport to and from the railway station. together accounting for about 80% of the traffic. The percentage using these two modes are higher in trips from the station than to the station. This is to be expected as it is more convenient to drop passengers at the station than to pick them up.

Table 10.10: Mode of Transport to/from Railway Station

Mode	To	From
Private Car	10.0	10.0
Taxi	45.0	50.0
Bus	28.3	35.0
Walk	6.9	5.0
Other	10.0	-
Total	100.0	100.0

Source: Urban Transport Study, Johor Bahru, 1981.

Slightly more than half the passengers were travelling alone while about a third were travelling in groups of two or three.

Table 10.11: Group Size of Arriving and Departing passengers

Size	Arriving (%)	Departing (%)
alone	52.5	55
2 or 3	35.0	33.3
4 or more	12.5	11.7
Total	100.0	100.0

Source : Urban Transport Study, Johor Bahru, 1981.

10.5 Train User Opinions

10.5.1. Inconveniences in Train

Expensive food (37% express, 58% ordinary) and dirty toilets (30% and 24% respectively) were the most frequent complaints recorded for both express and ordinary services. Uncomfortable seats was a complaint among half the ordinary train passengers. The low speed and number of trips did not bother most of the passengers, express or otherwise.

Table 10.12: Passenger Opinions of Inconveniences in Train

Inconvenience	Express(%)	Ordinary(%)
Poor Quality Food	8	6
Expensive Food	37	5.8
Too Many Stops	-	6
Too Slow	4	12
Train not punctual	6	2
Train Noisy	16	12
No entertainment	18	16
Uncomfortable seats	18	50
Dirty Toilets	30	24

Source: Urban Transport Study, Johor Bahru, 1981.

10.5.2 Inconveniences in J.B Station

The most common complaints were that toilets in the station were dirty, (45%), the bus station too far 39% and not enough seats (32.5%). Lack of shelter seems to feature more as a problem to ordinary train users (32% ordinary, 10% express). Lack of car-parking spaces was a problem to only 17% of the passengers. The fact that bus-routes were not displayed in the station did not feature prominently as a problem.

Table 10.13: Passenger Opinion of Inconveniences in Johor Bahru Railway Station

Inconvenience	Express (%)	Ordinary (%)	Total (%)
Taxi Station too far	2	-	1
Bus Station too far	44	34	39
Bus routes not shown	4	4	4
No shelters	10	32	21
Not enough seats	23	42	32.5
Car parking problems	18	16	17.0
Dirty toilets	50	40	45
Others	16	28	22

Source: Urban Transport Study, Johor Bahru, 1981.

.0 AIR SERVICES

This section describes the trip characteristics and opinions of passengers arriving and departing at Senai Airport. Freight services is described in another report.

11.1 Air Services In Peninsular Malaysia

In Peninsular Malaysia, there are nine passenger airports. International services are operated out of Kuala Lumpur and Penang Airports. The other airports, besides Senai in the Study Area, are at Malacca, Ipoh, Alor Star, Kota Bahru, Kuala Trengganu and Kuantan. Scheduled passenger air services are operated exclusively by Malaysian Airlines System.

During the 1975/1980 period, Passenger Traffic in Peninsular Malaysia grew at 12.4% per annum, increasing from 2.19 million in 1975 to 3.94 million in 1980.

11.2 Air Services In Study Area

The only airport in the area is located at Senai, 16 miles north of Johor Bahru. It is capable of handling Boeing 737's and started operation in January 1974. It provides domestic flights within the peninsula and to Sabah and Sarawak. Between 1974 and 1980 the number of departures have grown at an average rate of 35.6% per annum and the number of arrivals by 35.7%. The increase has been particularly marked in 1980 whence more than a 100% increase was observed.

Table 11.1: Growth Domestic Passenger Traffic at Senai Airport

	Embarked Number	% Growth	Disembarked Number	% Growth
1974	7,991		8,716	
1975	11,760	47.2	12,608	44.6
1976	14,306	21.6	15,408	22.2
1977	14,658	2.4	15,851	12.9
1978	16,639	13.5	13,662	24.0
1979	23,462	41.0	26,524	34.9
1980	49,645	111.6	54,328	104.8

Source: Department of Civil Aviation

11.3 Personal Characteristics of Air Travellers

Some 85 percent of the passengers interviewed were males. They were predominantly in higher income occupations. Some 32% were at the administrative and managerial level and another 25% in the professional & technical sector. The remaining occupations are shown in Table 11.2 below.

Table 11.2: Occupation of Air Travellers

Occupation	Percentage
Administrative & Managerial	32%
Professional & Technical	25%
Clerical & related	6%
Sales	13%
Service	7%
Factory, Const, Transport	2%
Agriculture, Animal Husbandry, Fishery	-
Student	5%
Housewife	3%
Others	7%
Total	100%

Source: Urban Transport Study, Johor Bahru, 1981

11.4 Trip Characteristics

11.4.1 Origin and Destination

Kuala Lumpur dominates as the main origin and destination of passengers flying into Senai Airport, accounting for 80% of the arrivals and 77% of the departures. The next most important origin and destination is Malacca. Traffic from the north and east coast of the peninsula is relatively minor.

Table 11.3: Origin of Arriving Passengers & Destination of Departing Passengers

Place	As Origin of Arriving Passengers (%)	As Destination of Departing Passengers (%)
Kuala Lumpur	80.0	77.0
Malacca	12.5	8.2
Ipoh	-	5.0
Penang	5.0	1.6
East Malaysia	-	3.2
Overseas	2.5	5.0
Total	100.0	100.0

Source: Urban Transport Study, Johor Bahru, 1981.

11.4.2 Trip Purpose

Work and business trips account for about 58% of the arriving and departing traffic. Holiday and home trips are equally important, each accounting for 20% of arriving traffic and 12% of departing traffic.

Table 11.4: Trip purpose of Air Travellers

Purpose	% of Arriving Passengers	% of Departing Passengers
Work/Business	57.5%	58.3%
Holiday	20.0%	11.7%
Home	20.0%	11.7%
Others	2.5%	18.3%
Total	100.0	100.0

Source: Urban Transport Study, Johor Bahru,1981.

11.5 Impact Of Senai Airport Passenger Traffic On Urban Transport

On average in 1980, there were 136 departing passengers and 149 arriving passengers. Currently transportation between Senai Airport and points in the Study Area are afforded by three modes; viz

Private
Taxi
MAS bus

The fare by charter taxi from Senai to Johor Bahru is $20 while by MAS bus it is $5/- per person

11.5.1 Trip Generation by Arriving Passengers

Of the arriving passengers, 72.5% travelled alone while the remaining 27.5% travelled in groups of two or three.

Passengers were mainly going to Johor Bahru (82.5%). Kluang was also a important destination accounting for 7.5%. Passengers going to Singapore accounted for 10%.

Table 11.5: Destination of Arriving Passengers

Destination	Percentage
Johor Bahru	82.5%
Singapore	5.0
Kluang	7.5
Kulai/Senai	2.5
Kota Tinggi	2.5
Total	100.0

Source: Urban Transport Study, Johor Bahru,1981.

The main mode of transport to passengers' destinations are by private car and taxi. The percentage using the MAS bus at 5% is very small, implying an average of about 2 - 3 passengers per trip. However the sample is too small for such a conclusion to be drawn confidently.

Table 11.6: Mode of Transport to Destination

Mode	Percentage
Private Car	55%
Taxi	35%
MAS bus	5%
Others	5%
Hire car	-
Shared Taxi	-
Total	100%

Source: Urban Transport Study, Johor Bahru,1981.

On the proposed express link to Johor Bahru and Singapore, some 57.5% were of the opinion that they would use this service provided the fare is same as for MAS bus. Another 32.5% were prepared to use this service so long as it is lower than the taxi fare of $20.00 to Johor Bahru. Some 10% were not in favour of such a service.

11.5.2. Trip Attraction of Departing Passengers

Of the departing passengers some 62% travelled alone while 35% in groups of two or three.

Table 11.7: Distribution of Passenger Group Sizes

Size	Percentage
Alone	61.7%
Two or Three	35.0%
Four or Five	1.7%
More than five	1.6%
Total	100.0%

Source: Urban Transport Study, Johor Bahru,1981.

Most of the departing passengers came from Johor Bahru (78%) and Singapore (10%)

Table 11.8: Origin of Departing Passengers

Size	Percentage
Johor Bahru	78.3%
Singapore	10.0%
Kluang	1.7%
Kulai/Senai	1.7%
Others	8.3%
Total	100.0%

Source: Urban Transport Study, Johor Bahru, 1981.

Most of the departing passengers arrived by private car (57%) or taxi (38%).

Table 11.9: Transport to Airport

Mode	Percentage
Private Car	56.7%
Taxi	38.3%
Shared Taxi	3.3%
MAS Bus	1.7%
Total	100.0%

Source: Urban Transport Study, Johor Bahru, 1981.

On the proposed express rail link between Senai Airport and Johor Bahru, about 87% were in favour with 55% agreeable if the fare is less than by bus and another 32% if the fare is more than by bus but less than by taxi. Only 13% were not in favour.

12.0 SHORT-TERM ACTION PLAN

12.1 Scheduled Bus

12.1.1 General

The long term plan envisages the increased attractiveness of bus usage vis-a-vis private car ownership. This is to be achieved by improvements in:

1. Public Transport Service Level,
2. Public Transport Facilities.
3. Fare Strategy Improvement.
4. Public Transport Management and Operations.
5. Introduction of New Mass Rapid Systems.
6. Institutional System.
7. Improved Landuse Pattern.

The short-term action plan is proposed as an immediate step in the achievement of the long-range plan and thus merges into the large package of the long term plan. The components abstracted into the short-term plan are displayed in Table 12.1 below:-

Table 12.1 : Short-Term Components of Public Transport Plan

Specific Strategy	Short-Term	Medium and Long-Term
Improvement of Public Transport Services	*	*
Improvement of Bus Transport Facilities/Fleet	*	*
Fare Policy Improvement	*	*
Improvement of Management and Operations	*	
Application of Innovations in Bus/Mass Rapid Systems		*
Improvement of Institutional System	*	*
Improvement of Landuse Pattern		*

12.1.2 Present Problems

(1) User Problems (Service Problems)

a) Bus Routes

: Certain areas are not covered viz. Taman Pelangi, Taman Seri Tebrau, Taman Sentosa, Taman Tasek.

: Routes are radial, therefore bus users who want to travel circumferentially have to change buses in town. This also unnecessarily increases bus-trip demands The frequency of transfers is exceptionally high as shown in Table 12.2.

Table 12.2 : Frequency of Transfers

Respondents interviewed at:	% Frequency of one or more transfers
Town Centre	52
Town Periphery	65
Kolam Air Area	32
Housing Estate	30
Industrial	48
Ulu Tiram	6
Pontian, Kulai, Kota Tinggi	40

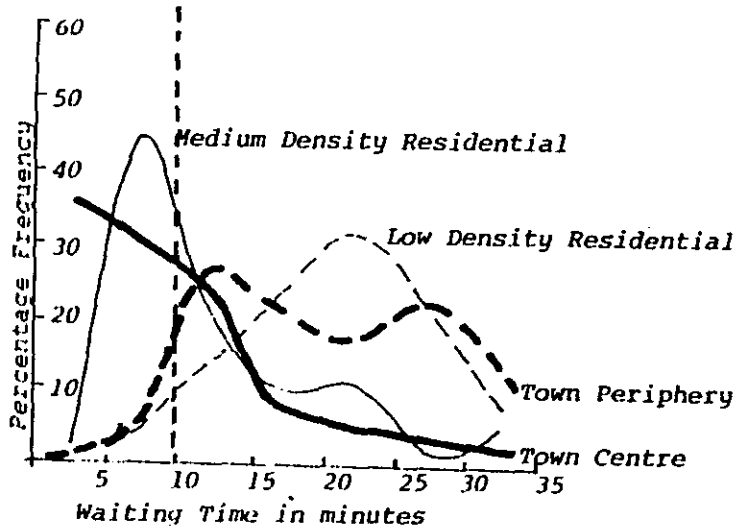
Source : Urban Transport Study, Johor Bahru, 1981.

b) Bus-stop Coverage

: Bus-stop coverage is inadequate resulting in longer than preferred walking distances (Fig. 12.1).

c) Long-waiting at Bus-stops (Fig. 12.2).

: Because of inadequate schedule or buses not following schedule the latter occurs because of breakdown of buses and because of traffic congestion.



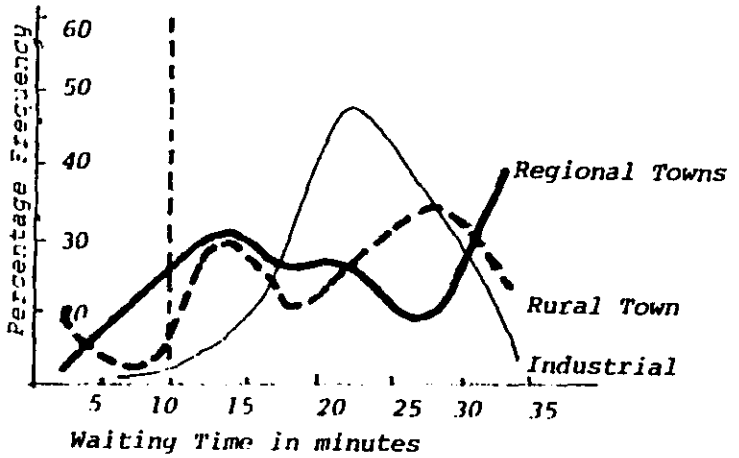
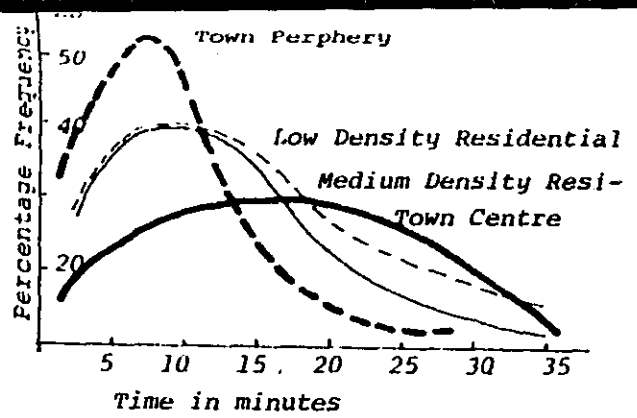


Fig. 12.2 : Waiting Time Distribution of Bus-users



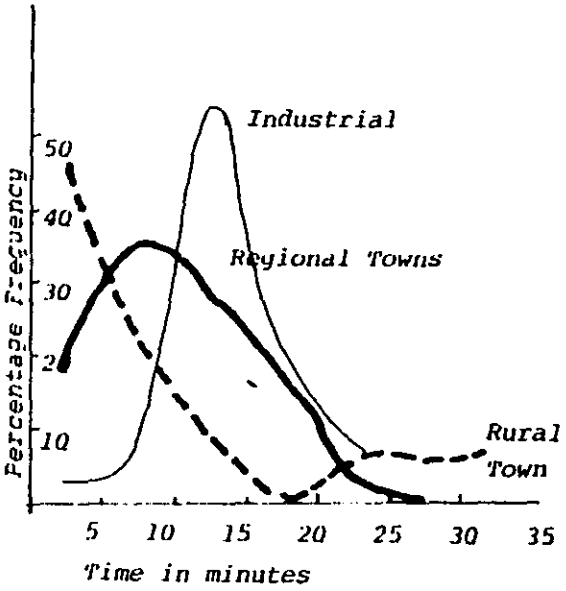


Fig. 12.1 : Distribution of House-to-busstop Walking Time

d) Poor Bus- Shelters

: The present design provides inadequate protection against sun and rain, especially in the town centre, where more space is required.

e) Rushing for Buses

: Because of the fear of not getting a place to sit or not getting on the bus at all, passengers do not queue up but rush for the bus. There is disorder when alighting passengers want to get down at the same time as most buses have only one door.

f) No place to sit in the bus

: Passengers complain they do not have a place to sit, sometimes on long journeys. Item (e) above and this are caused by a lack of capacity during peak hours.

g) Information display

: While most passengers appear to be familiar with their usual routes, there are complaints when commuters want to use different routes. Lack of information on schedule and detail route also deters potential users.

(2) Bus Company Problems (Management and Operation Problems).

a) Lack of flexibility in expansion

: The process of applying for new routes is slow. There are two departments (the Public Transport Licensing Board in the Ministry of Public Enterprises and the Registrar and Inspectorate of Motor Vehicles) which administer public transport affairs. A third government body, the Economic Planning Unit is involved in policy making.

In part, the absence of new routes since the last study in 1973 is due to this factor.

b) Inefficient Cost Management

Table 12.3 : Bus Operating Cost Per Mile

Company	Total Cost per mile (Cents) in 1980	Maintenance Cents per mile	Wages Cents per mile	Fuel, oil, tyres Cents per mile
A	126.8	30.7	48.7	26.8
B	112.1	17.8	40.7	23.3
C	124.6	25.4	44.1	23.6

The operating cost per bus mile appears to be very different. Companies A and C are 12% less efficient than B in unit operating cost. In terms of maintenance, A is 72% less efficient than B although fleet age is similar. Company C is 43% less efficient than B although its fleet is newer. In wages, A and C are 20% and 8% less efficient than B. In fuel, oil and tyres, A is 15% less efficient than B and C is about the same as B. (Table 12.3).

There appears a need to replace old buses to reduce maintenance costs.

c) Unsound Financial Management

: Company C has been operating at a loss. In 1980, it paid out interest equivalent to 97% of its paid-up capital.

d) Controlled Fare

: Bus fares are controlled by the Public Transport Licensing Board.

e) Encroachment from pirate taxis, school and factory bus

: Illegal operations of the above modes cut into the revenue of bus companies.

f) Traffic Congestion along Bus Routes

: Congestion occurs at the following places

. turning from Jalan Ah Fook to Jalan Station

. Jalan Tun Razak near Immigration Complex

. turning from Jalan Selat Tebrau into Jalan Ibrahim

. Jalan Tebrau from Police Depot to Taman Sri Tebrau

Because of congestion buses cannot make the route on time. Thus they are off schedule and the actual frequency is lower than scheduled.

g) Flooding along Bus Routes

: Flooding frequently occurs at

. 3½ m/s Jalan Scudai

. 5 m/s Jalan Kota Tinggi

(3) Facilities Problems

a) Bus Terminal

The major problem is that there is no permanent structure.

Because the existing station is not located along bus-routes, buses infrequently call at the bus-terminal. There is thus no connection between town bus routes and inter-regional routes which collect passengers at the bus-terminal.

The existing terminal appears to be poorly planned with no separation between each mode. The major problem is vehicular/pedestrian conflict. The structures are temporary and inconvenient to users as there are no proper toilets, places to sit and protection against sun and rain. Cleanliness in the terminal needs to be improved.

There is no route map schedule or information on fares. This is inconvenient to new users and users who are not frequent users of particular routes.

b) Town Bus-stands

During the morning peak there are 78 bus movements at the bus-stands in the town centre (At Jalan Ah Fook and Jalan Tun Razak). The survey revealed a maximum of 70 bus movements per hour during the peak hour. Travel time survey indicates stop time of more than one minute. There thus appear a need for at least a two-channel stations in the town cnetre as there are about 1.75 bus movements per minute.

The bus-stands in town do not provide adequate space. At Jalan Ah Fook, there are 1300 passenger movements per hour. The space provided by the bus-stands is inadequate. The design does not offer protection against sun and rain.

The bus-stands are without lay-bys. On the heavily trafficked Jalan Tun Razak this inconveniences other transport modes. At Jalan Ah Fook this is minor, as traffic from the round-about is now prohibited from turning directly into Jalan Ah Fook. Vehicle volume near the Ah Fook bus-stand is thus low and the buses do not hold up other traffic.

As with the terminal, there is no bus route map, schedule or fare information.

c) Suburban Bus-Stops

There is inadequate coverage of bus-stops, as explained in user problem (b) above..

The designs do not meet requirements. Most stops are without shelters or a place to sit on. There is no route, schedule or fare information eithers.

d) Roads

Congestion and flooding are already mentioned.

In addition, there are problems posed by on-street parking and digging up roads.

(4) Institutional Problems

a) Lack of forward planning and coordination

Under the existing government organization for public transport, there appears to be no planning and little coordination. Neither the EPU, the PTLB or the RTD are involved in anticipating problems, nor planning expansion. The current concerns appear to be determination of fares, approval or disapproval of route applications and enforcement. It is however promising that the RTD is now beginning to study these problems.

12.1.3 Short-Term Action Plan (Table 12.4)

1) Improvement in Bus Services

a) The expansion of bus services into the following areas:

- Pasir Pelangi, Taman Maju Jaya, Taman Sentosa, Taman Seri Tebrau, Taman Tasek

b) Improvement in routing

- re-routing in CBD ; to be proposed after improvement of traffic management (Fig. 12.3)
- sub-centre and suburban routes (Fig. 12.4)
- rural routes

c) Shortened Interval

- frequency of each route to be planned after O-D data is processed

d) Improved Reliability

- to ensure that buses are on schedule, the schedule should be realistically timed and the number of buses allocated accordingly
- breakdowns should be minimised by regular servicing and maintenance, replacement of old buses should also help to reduce breakdowns
- delays caused by congestion should also be minimised through the measures in 2 (c). There should be a set of contingency detours in the event of congestion, flooding or construction works. Signs should be put up at the affected bus-stops

Table 12.4 : Short-Term Components of Long-Term Strategies

	Short-Term	Mid- or Long Term	Notes
Improvement of Bus Services			
1. Extended	*	*	
2. Network Improvement	*	*	
3. Frequency (Headyway) Improvement	*	*	
4. Improved Reliability	*	*	
5. Free-Ride System		*	in CBD
6. Dial-a-bus		*	when telephone service is good enough
7. Ride and Ride System			only if feasible
8. Cycle and Ride System			"
9. Park and Ride System			"
10. Bus Hierarchy	*		
11. Subscription Service	*		
12.			
Improvement of Public Transport Facilities			
1. Bus Terminal		*	
2. Bus-Stops/Stands	*	*	
3. Access to Bus-Stops	*	*	
4. Bus Streets		*	
5. Bus Priority		*	
6. Bus Lanes		*	
7. Bus Ways		*	
8. Car Restriction		*	
9. Transit Hall		*	
10. Bus Information System	*		
11. Bus Fleet	*	*	
12. Mini-taxi Stations	*		
13. Coordination of P.T. Terminals		*	
14.			
Improvement in Fare and Pricing Policy			
1. Zone Fare System	*		
2. Fare Incentive System	*		
3. Fare Prepayment	*		
4. Discount Farea for Selected Groups	*		
5. Premium-service-Premium-Fare	*		
6.			
7.			
Improvement in Management and Operations			
1. Service and Maintenance Training	*		
2. Planning Training	*		
3. Control Training	*		
4. Other Employee Training	*		
5. Schedule Control	*		
6.			
7.			
Introduction of MRT			
1. Mass Rapid Transit		*	if feasible
2. Use of Railway for Commuters		*	if feasible
3.			
4.			

Table 12.4 (contd)

5.			
6.			
Improvement in Institutional System			
1. Systematic Regulations		*	
2. Enforcement		*	
3. Bus Operation Cost and Revenue Accounts	*		
4. Regional Consultative Committee	*		
5. Staggertime	*	*	
6. Queue	*	*	
7. Choice of School		*	
8. School Bus Association	*		
9. Factory Bus Association	*		
10.			
Improved Landuse Pattern		*	

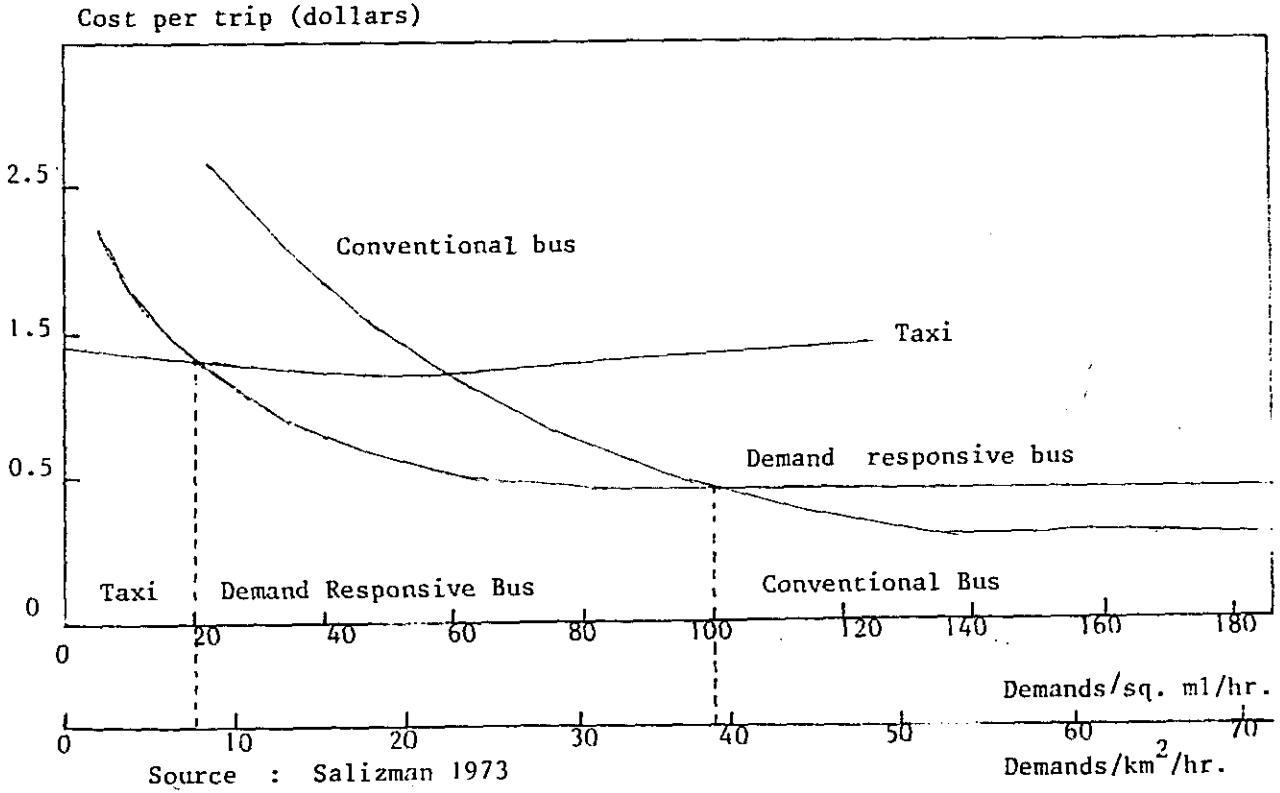


FIG. 12.3 : : COST PER TRIP FOR TAXI CONVENTIONAL OR DEMAND RESPONSIVE BUSES AS A FUNCTION OF THE DEMAND DENSITY.

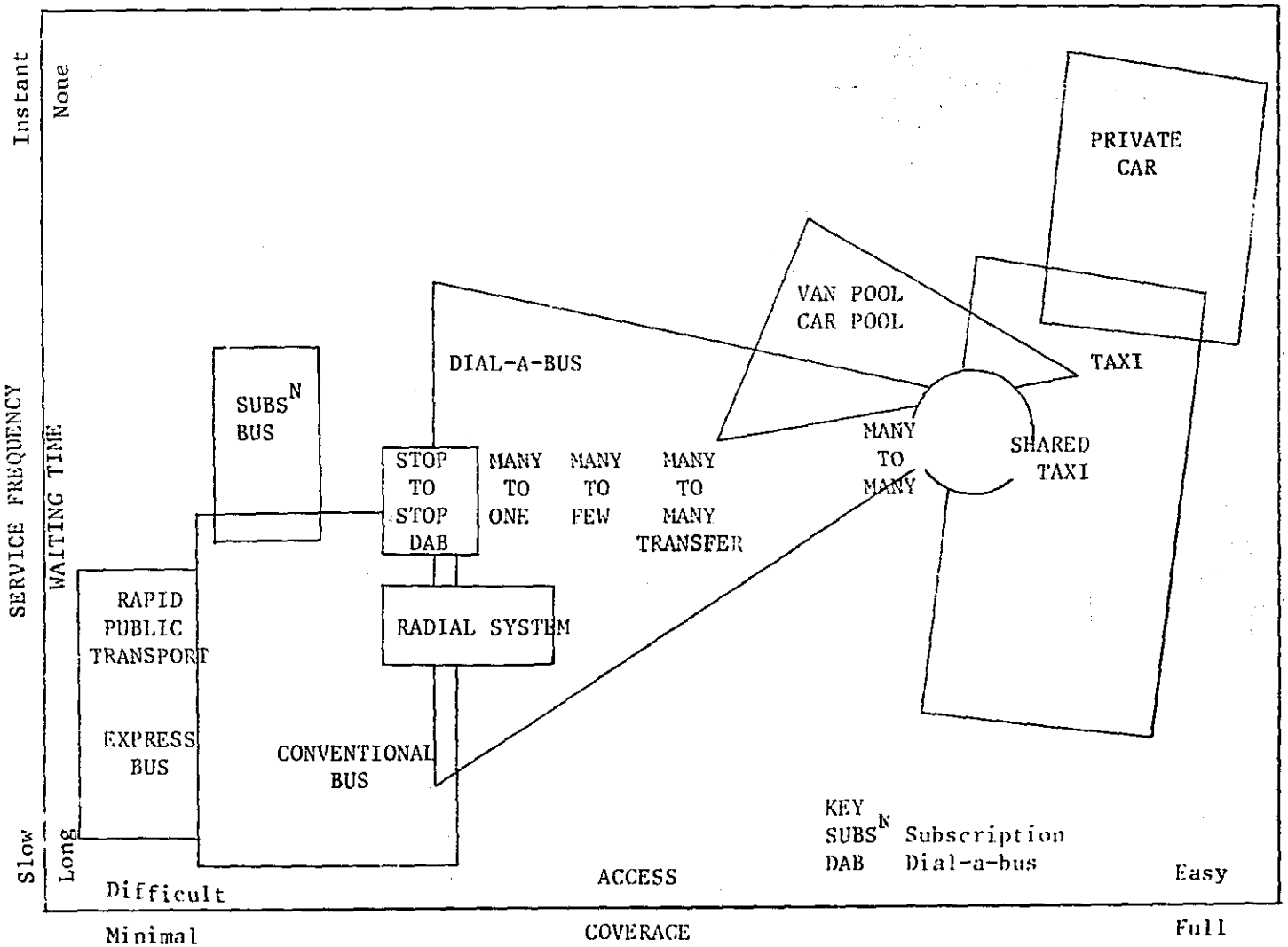


FIG. 12.4 : CONCEPTUAL FRAMEWORK - TRANSPORT SYSTEMS.

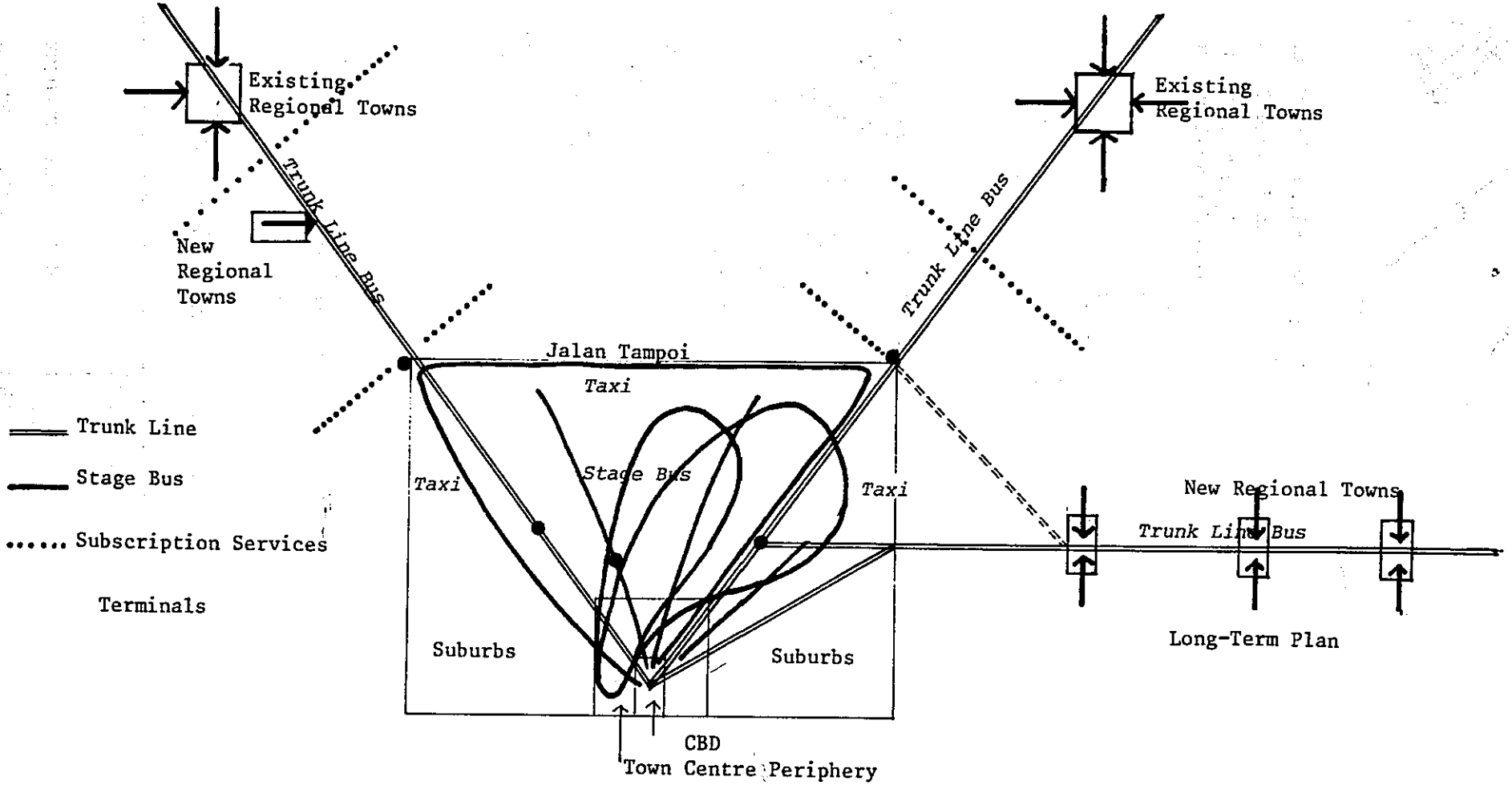
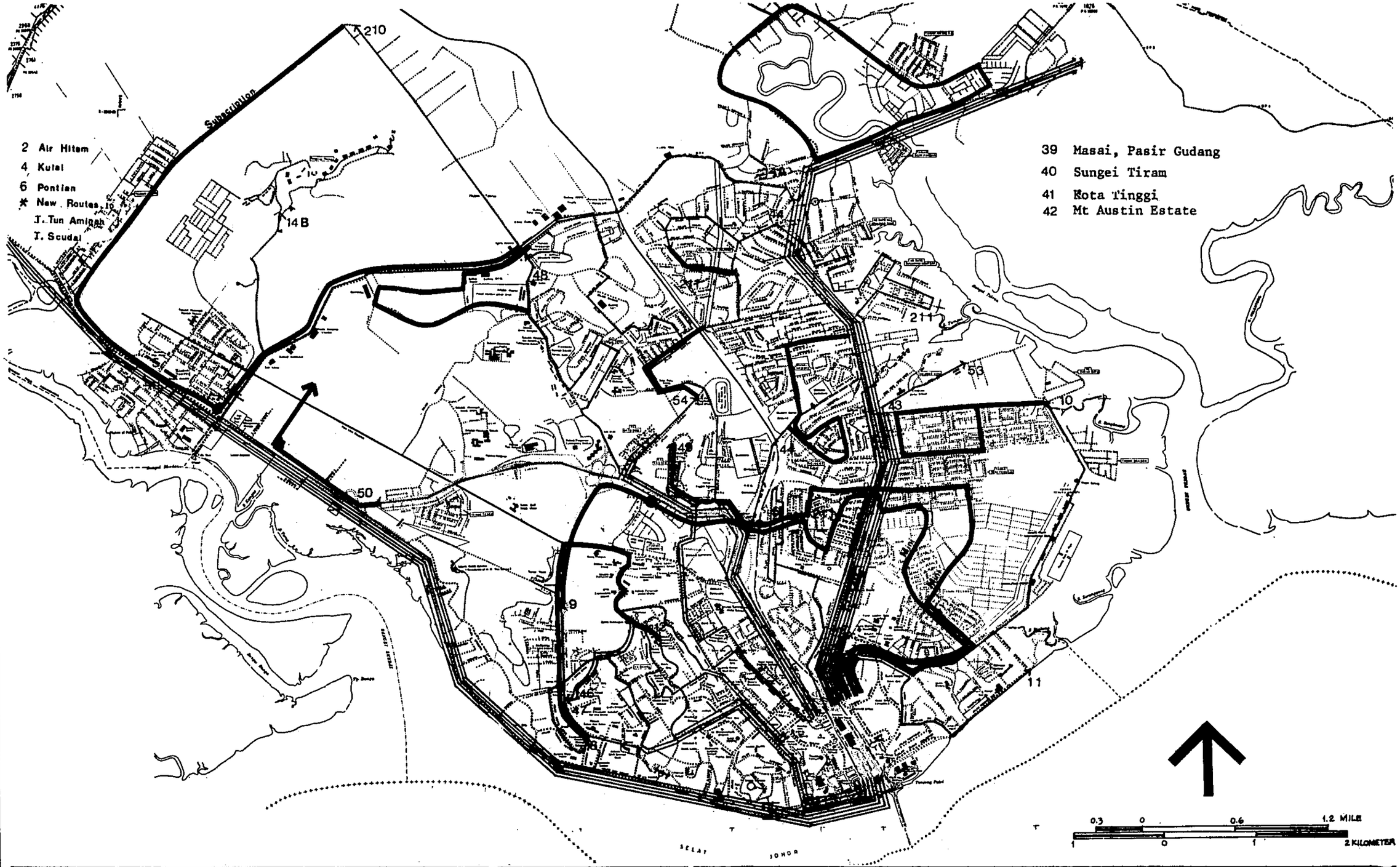


Fig. 12.5 : Conceptual Public Transport System



URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- Existing Bus Route
- New Route or Extension
- End of Route with Route Numbers (e.g. 8)
- Cancelled Route

TITLE:

PROPOSED BUS ROUTES IN JOHOR BAHARU

MAP NO.

FIG. 12-6

2) Improvement in Bus-Stand

a) Improved Bus-Stand Design

: Every bus-stop should have the following

. shelter from rain or sun

. adequate seating

. bus-route map

. waste disposal

. bus-lay by

: . Expansion of Jalan Ah Fook Bus-stop

b) Improved Access to Bus-Stand

: In the short-term, they should be a target of one bus-stand per direction every 300 metres.

c) Street Improvement

: To increase bus-speed, there should be improvements in streets used by bus through traffic control and management measures.

d) Improved Information System

: All Bus-stands should be provided with route maps, schedule and fare system. The route map should also be shown inside the bus.

3) Fleet Improvement

a) Bus-Types

: There should be systematic replacement of aging buses. This will reduce maintenance cost and minimise breakdowns. The new buses should

. have two doors

. the doors should be wider

. be low to facilitate boarding/alighting especially for the handicapped and aged and to improve safety

. standee buses should be used on short routes

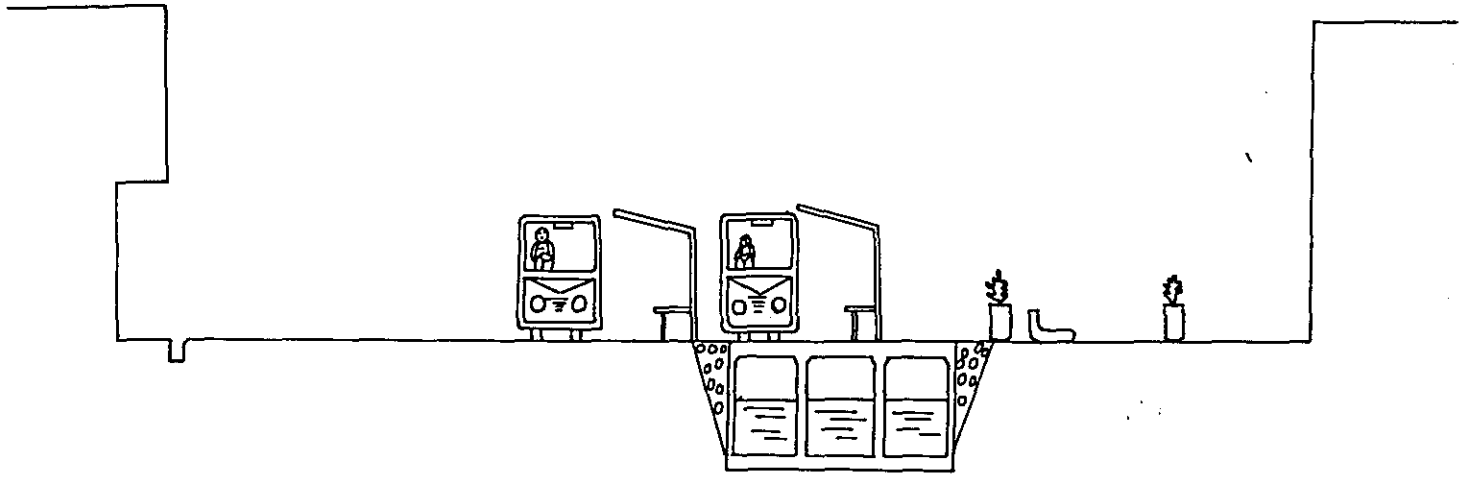


Fig. 12.7 : Proposed Dual-Channel Bus-Stop at Jalan Ah Fook

The capacity of the buses should be related to the demand. Where demand density is low, smaller capacity buses should be used. In the short-distance inter-town services, the buses used should have capacities of less than 20 persons sitting. Where demand density is high, there should be large capacity buses. If the routes are short, standee buses should be provided.

b) Incentives to Replace Buses

Incentives in the form of accelerated depreciation allowance should be provided by the Ministry of Finance to encourage replacement.

Import duties on buses should be minimised.

4) Improvement in Fare and Pricing Policy

a) Discount Fare for Special-User-Group

The handicapped and elderly should be provided with a discount system.

b) Fare-Prepayment Scheme

Fare prepayment

- reduces the expense and inconvenience at each boarding (ticketing, handling change)
- increase ridership and revenues
- improves cash flow for the operator
- shortens boarding time
- heightens public awareness of public transport

In principle, there should be a discount on prepaid fares. While uniform card would be convenient, the differences in trip length and trip purpose should be considered.

Since work and school trips demand tends to have low price elasticity compared with other trips, it is proposed that there should be two categories of cards.

- Peak Hour cards priced at 20 round-trips per month and with unlimited mileage on fixed sectors on town bus services. For those working 5 to 6 days this is a discount of 10 to 33% even when transfers are not considered. The use of the card for other trips will enhance the discount without increasing the operator's cost as non-peak hour occupancies are currently low
- Non-Peak Hour cards for unlimited mileage during non-peak hours on town services. This category of trips, being more elastic, will have to be priced more carefully.

In both cases, it would be advisable to determine amount of discount through market research or through pilot schemes. There should be extensive promotion to accompany such a scheme.

For the fare prepayment scheme to succeed, the coordination between bus companies should be improved. The scheme should be operated in a unified manner even though the companies may be separated.

c) Premium Service-Premium Fare Scheme

Studies have shown that a few reliable, services a day for work trips can pay for themselves out of fare revenue if premium fares are charged. It is proposed that fares for peak hour commuting may be increased to

perhaps 20 or 25 cents for the first mile with a concommittant increase in service level (viz increased bus speed through express services, skip-stopping; increased frequency: guaranteed schedule). At the same time, the current type of service, while being improved, should still be kept in service as an alternative to this premium-fare-premium-service-scheme. This competition will ensure that the level of service is maintained at a level superior to the non-premium service to deserve the premium fare.

5) Improvement in Management and Operations

a) Improvement in Financial Management

The operating capital of Company C should be increased.

b) Improved Efficiency

With the introduction of new buses, the rate of repairs and breakdown will be minimised. However, there will still be a need to service and maintain these new vehicles in addition to the aging ones not yet replaced.

The operating costs of bus companies should be controlled via the statutory declaration suggested in 6 (c). Comparison with other bus companies in and outside the region will give indications of the level of cost efficiency. The control of fares based on reasonably efficient cost levels will deter bus companies from inefficiency.

c) Employee Training

There should be enhanced training in the planning of routes, frequency, bus-type required and contingency scheduling. Tax incentives of credits should be given to such costs incurred. In-service training to enhance driving safety should be given to bus drivers.

6) Institutional Improvement

a) There should be a Public Transport Consultative Committee consisting of government officials, bus companies, planners and laymen and bus-users.

The bodies involved should be

. State Economic Planning Unit (Chairman)
. State Public Works Department
. State Traffic Police
. State Road Transport Department
. (Regional Public Transport Licensing Board)
. State Town and Country Planning Department
. Municipal Authority
. Bus Company Representatives
. Transport Planners
. Concerned Citizens/Bus Users
. Developers (by invitation)

The function of this committee would be

. to anticipate areas requiring bus services
. to assist in bus routing
. to advise the PTLB on fares and fare schemes
. to advise the PTLB on other public transport

b) There should be improved coordination between the PTLB and the RTD. The possibility of uniting these two bodies should be considered in the light of advantages for public transport services.

c) The RTD should be active in the checking of service levels, particularly in terms of reliability of schedule.

d) The public should be encouraged to queue up to enter buses. This will promote safety as well as ensure a shorter boarding time.

e) The present week system in Johor Bahru is unique. State Government departments work from Saturdays to Thurdays and private companies with Federal Government departments work from Mondaysto Saturdays. To reduce travel demand, there should be encouragement to work a 5-day week. To reduce peak hour demand, staggertime should also be encouraged. The present condition where government offices start at 8.15 am while private firms start mainly at 8.30 or 9.00 am should be expanded.

12.1.4 Bus Service and Routing Proposal

1. Bus Travel Demand Patterns and Problems

The CBD is the focal point of trips which are mainly radial in pattern, originating in the town periphery, suburbs and also inter-regional traffic crossing the causeway. The concentration of trips has brought a concommitant concentration of bus routes.

These characteristics give rise to the problems of traffic volumes in excess of road capacity. Inadequate capacity causes congestion and delays. It is thus more difficult to manage bus routes effectively and to handle the high volume of passengers.

In the town periphery and sub-centres bus trip demand is not as concentrated as in the CBD. They are also varied in direction of flow. The problems in the town periphery and sub-centre are related to low road capacity and thus congestion along the radial roads and roads serving the sub-centres.

In the suburbs, trip demand is stable and in numerous directions. Trip purposes are varied and destinations dispersed. There is thus a problem of adequate routes to minimise transfers at the CBD. The lesser density of residential development in comparison with the CBD causes problems of access. Currently, the access to bus stops, waiting time and reliability of service leave much to be desired. However, if the short term proposed action plan is adopted, these problems should be ameliorated if not eliminated.

The rural areas are characterised by very low density, dispersed development. Demand density is inadequate for efficient bus operations yet it is necessary to provide public transport cheaply.

In the regional towns, the demand for inter-town travel is directed towards Johor Bahru. The requirement is minimised travel time. In the future, this demand is expected to increase greatly in line with the need to commute to and from the new towns towards Pasir Gudang and along Federal Route 1 up to Kulai.

In areas with high demand density, the long term solution for public transport would be to increase capacity of bus streets, and bus facilities. Where trip demand is in many directions as in the suburbs, then there is a need to provide for looped routes which by-pass the town. In residential areas, access to bus-stops can be improved by spacing bus-stops more closely. Waiting time should be reduced by increasing frequency.

In the rural areas where demand density is low, alternative modes such as small capacity buses should be explored. For inter-town services, fast, reliable and high capacity bus services should be provided.

2. Conceptual Hierarchy

A possible classification of public transport modes is shown in Table 12.6. In terms of routes, individual means of transport are most flexible while fixed route transport (bus lines, railways) and subscription services (school, factory bus) are fixed. Taxis and dial-a-ride buses lie in between.

In terms of schedule, private vehicles are most independent while fixed route transports are fixed. Schedule for subscription services may be pre-arrangement as with dial-a-ride. Taxis may also be pre-arranged by telephone or be hailed. The private car is permanently available while fixed route transport pick up passengers only at stops.

The car and van pools give a reduced waiting time and good access (almost door-to-door). The taxi gives better access but the waiting time range is wider; sometimes as good as in car/van-pool, sometimes much longer. The share-ride taxi's characteristics are in-between.

The best access and shortest waiting time is, of course, offer by private vehicles.

3. Conceptual Proposal

Based on the above conceptual framework, a more rational public transport hierarchy is proposed. There should be seven modes of public transport in the Study Area. (Fig. 12.4).

Travel and commuting between the regional towns of Pontian, Kulai and Kota Tinggi to Johor Bahru together with travel demands to and from the new urban centres between Kulai and Johor Bahru and between Pasir Gudang and Johor Bahru will increase tremendously in the future. The trunk-line service, is envisaged as a hybrid between the conventional stage bus and express bus. These maxi-bus with capacities ranging from 40 to 60 seats (no standing passengers) should travel at greater than 50 kph with stops only at 3 to 5 km apart.

The conventional bus services currently existing in town should be retained and upgraded. There should be a target of stops every 300 m. In the residential areas, where existing roads are not planned as bus routes, small capacity buses (16 to 20 passengers) should be used. Small capacity buses will lower costs and at the same time allowing higher frequencies (6 to 10 times per minute than stage buses 4-6).

12.2 Factory bus and School Bus

1) Factory Bus

The number of factory bus is small now, so there are few problems.

It is possible to indicate the need for more systematic organization in order to avoid overlapping of their route and congestion around industrial estate (which are forecasted in near future).

An organised association or cooperative should control service level for the protection of users and to help individual operators in getting loans and solving administrative problems

2) School Bus

The school bus provides good service, ie. the safety of school children and the convenience of door to door service. It is possible to indicate the need for more systematic organization similiar to factory bus.

An organized association or cooperative should protect the interest of school children and help operators in getting loans and solving administrative and technical problems.

12.3 Taxi

Taxis are more efficient where demand density is low and provide a flexible route and door to door service.

The number of taxis is not a problem because the ratio of town taxis to population in Johor Bahru district is much higher than Singapore and Penang.

(Johor Bahru 1.6 vehicle/thousand)
(Singapore 0.7 vehicle/thousand)
(Penang 0.5 vehicle/thousand)

In order to promote the usage of taxis, it is necessary to ensure that taxis operators charge fairly ie. use taxi meter and to eliminate pirate taxis.

To ensure a more even spread of taxis service, mini-taxi stations should be set up in residential areas preferably in the commercial centre.

Table 12.5 : Demand Pattern, Problems and Suggested Improvements

Area	Demand Pattern	Problems	Suggested Improvements
CBD	. concentration of trip generation and attraction . trip demand radiates from CBD . concentration of bus routes	. road capacity . effective handling of passengers . effective management of bus routes . reliability of service . transfer occurs here	. central terminal for exchange . facilities to enhance convenience (eg. waiting, eating, rest) . exclusive bus lanes
Town periphery Sub-centres	. stable trip generation and attraction . varied trip directions	. congestion along radial roads . have to transfer from CBD to reach here . narrow roads	. sub-terminal . bus lane, bus bay . loop routes
Suburbs residential	. stable trip generation . multi-directional trips	. access to bus-stop . long waiting time . reliability of service	. higher density of bus-stops . increase frequency . alternative routes . shortening bus-stops times
Rural	. small demand density	. inefficient bus operation . encroachment of illegal taxis	. establish transport system ~~for~~ for small demand (low frequency, small capacity low)
Regional centres	. high demand to Johor Bahru town . short town trips . surrounded by large rural areas, thus rural trips	. rapid arrival at Johor Bahru	. rapid transit system to Johor Bahru . establish transport system for small demand
Others . School . Factory	. demand concentrated at points in time . many-to-few trip type	. for factory, no scheduled bus service from 12.00 midnight to 6 am.	. continue school bus . continue factory bus . introduce stage bus service in accordance with demand

Table 12.6 : Possible Classifications of Transport Services

Service Characteristics		Individual Means	Demand-Responsive Systems		Subscription Service	Fixed Route Transport
		Private, car two-wheeler	Taxi	Dial-a-Ride bus	School and Company Buses van-pool car-pool	Bus lines, Tramways Railways
Route	- Fixed				X	X
	- Fixed with Many to one (few)			X		
	- Deviation Many to Many			X		
	- Flexible	X	X			
Schedule	- Fixed					X
	- With pre-arrangement			X	X	
	- In real time	X	X	X		
Mode of Collection	- Permanent availability	X				
	- Telephone call		X	X		
	- Hailing		X			X (*)
	- Pre-arrangment			X	X	
	- At station		X		X	X
Comfort	- Assured seat	X	X	X	X	
	- Regularity					Variable
	- Absence of strangers	X	X (*)		Moderate	Yes

*) In a few cases.

Subscription services collect passengers either at a stop or by pre-arrangement. Dial-a-ride services collect passengers either by phone or by pre-arrangement.

The comfort of private vehicles is best as a seat is assured and there are no strangers. With fixed bus routes, there is no assured seat, regularity is variable and there will be many strangers. With subscription services, a seat is assured and presence of strangers is minor. With dial-a-ride, and taxis seats are assured.

Fig. 12.3 shows a comparison of cost in relation to demand density for taxis, demand responsive bus and conventional bus. The taxi is most efficient where demand density is less than 8 trips/km^2/hr (20 trips/sq. mile/hr) while the demand responsive bus is the most efficient up to 39 trips/km^2/hr (100 trips/sq. mile/hr). The conventional bus is most efficient for demand densities higher than this.

Given the considerations above, a conceptual framework is evolved as shown in Fig. 12.4.

The express bus and rapid public transport gives minimal coverage and service frequency is low. The conventional stage bus gives similar service frequency but better coverage and access. The subscription bus (factory, school) can give marginally lower access and coverage as the convential bus but waiting time is reduced.

The dial-a-bus alternatives can cater to a wide range of service frequency and access. The radial system and stop-to-stop dial-a-bus gives low coverage and middling service frequency. Many-to-one, many to-few and many-to-many dial-a-bus services improve the coverage and access.

When demand density is low, subscription services similar to the school and factory bus should be introduced. This should be assigned to provide feeder services between rural villages and rural towns and also between rural villages and peripheral towns like Tampoi and Pandan. In more dispersed localities, cycle and ride should be encouraged. School and factory bus services should be expanded within the municipality but should be secondary to trunk-line services along the Johor Bahru - Pasir Gudang corridor.

Share-ride taxi services should continue in the rural areas to supplement subscription services. Within the municipality, share-ride taxis which are illegal should be prohibited to improve bus travel demand. Taxis should be restricted to single payment services. The existing inter-town taxi services should be continued.

Concurrent with the above plan, there should be development of new terminal facilities to collect and control peripheral and suburban transfers.

Trunk line passengers may want to go into the CBD, the town centre periphery or the suburbs. Sub-terminals should thus be provided at the intersection of trunk lines and peripheral bus routes. Suburban bus transfers should occur at sub-terminals which can also handle transfers from the trunk line. In the CBD, there should be facilities for handling high passengers flows and bus movements.

The actual bus routes and terminal locations should be concluded only after origin and destination information are processed for the current year, and for the medium and long term.

Type		Route Length (km)	Capacity	Speed (kph)	Frequency (per hour)	Distance Between Bus-stops	Road assignment and purpose
1. Trunk Line Bus		30-50km	40-60	50	2-6	3-5km	Assigned to bus ways primary distributors to connect regional centres and satellite towns with Johor Bahru; may be developed into Rapid Transit
2. Feeder Bus	2.1 existing stage bus	10km	40	15-30	4-6	300	Within Outer Ring Road (Jalan Tampoi), to secondary and local distributors to serve in Johor Bahru town area.
	2.2 mini-stage bus	10km	16-20	15-30	6-10	300	
3. Subscription Bus	3.1 school, factory bus	10km	16-20	20-30	based on factory, school shifts	as necessary	Factory routes, School routes
	3.2 other subscription	10km	10-20	20-30			Outside Outer Ring Road
4. Share-Ride-Taxi		5	5	40-60			. assigned to areas which have few bus routes
5. Conventional		No change					. as at present

Table 12.6 : Short Term Route and Frequency Plan (Changes Only)

Old Route Number	Changes	Additional (km)	Peak Hours			Non-Peak		
			Loop or Line	Trip Purpose	Interval	Loop or Line	Purpose	Interval
New Route	Tampoi-Jalan Kempas-T. Johor Jalan Scudai - Tampoi (Subscription)	+	Loop		Subscription	Loop	Others	30 - 60 (small Bus)
14A and 44	44 cut into Melodies Garden, Taman Mejidi	nil +	Loop	Work	7.5	Loop	Others	10
50	Extend to Bandar Baru Tampoi	+	Line	Work Others	30 min	Line	Others	10
21 and 54	Link via J. Garoda, J. Dewata	1.6 +	Loop	Work	7.5	Loop	Others	15
9	Extension to J. Larkin Century Gardens, Pelangi (Mini)	11.2	Loop	School Work	5	Loop	Others	10
49	Extension to Century Gardens, Pelangi(Mini)	9.6	Loop	School Work	5	Loop	Others	10
10	Extension to T. Sentosa (Mini)	3.2	Loop	Work	5	Loop	Others	7.5
New Route	T. Tun Aminah, T. Scudai, Senai		Line	Work	10	Loop	Others	15
4	plus to Senai Airport	1.5	Line/ Loop	Work	15	Line/ Loop	Others	30
48	Extension from J. Datin Halimah to J. Janika - J. Senggama - J. Kukoh (Mini)		Loop	School/ Work	5	Loop	School/ Work	10
46	detour to J. Abu Samad - J. Tasek Utara - J. Kolam Air (Mini)		Loop	School/ Work	5	Loop	School/ Others	10

13.0 LONG-TERM PLAN

13.1 Policies and Strategies

In this section, policies and strategies specific to public transport are developed within the context of the targets for transportation in general.

The minimization of energy consumption, the reduction of capital investment, the more effective utilization of urban space and better social equity will be better achieved by a policy to increase the competitive edge of public transport vis-a-vis the private.

To increase the attraction of public transport, the following are proposed.

1. To improve public transport services, facilities and system so as to make it more convenient and comfortable to public transport users as well as to maximise the usage of public transport.

2. To improve the management and operation system thus making it more efficient and safer.

3. To provide for the transportation of the poor such as the elderly and the handicapped so as to contribute to social equity.

Based on the above policies, the following package of the strategies are proposed:

1. Improvement of public transport services.
2. Improvement of public transport facilities.
3. Fare strategy improvement.
4. Improvement of management and operations.
5. Introduction of Mass Rapid System.
6. Improvement of Institutional system.
7. Improved Landuse Pattern.

The timing for the implementation of each strategy will differ since some strategies may be acted upon immediately on a short term, some may be continuous and others may be implemented on a long term basis. The timing of the implementation is roughly shown in Table 13.1. The involvement of social, technical and institutional aspects is shown in Table 13.2.

Table 13.1 : Timing of Strategies for Implementation

Specific Strategy	Short-Term	Medium and Long Term
Improvement of Public Transport Services	*	*
Improvement of Bus Transport Facility/Fleet	*	
Fare Policy Improvement	*	*
Improvement of Management and Operations	*	
Application of Innovations in Bus/Mass Rapid System		*
Improvement of Institutional System	*	*
Improvement in Landuse Pattern		*

Table 13.1 : Timing of Strategies for Implementation

	Short-Term	Mid- or Long Term	Notes
provement of Bus Services	*	*	
Extended Coverage	*		
Network Improvement	*	*	
Frequency (Headway) Improvement	*	*	
Improved Reliability	*	*	
Free-Ride System		*	in CBD
Dial-a-bus		*	when telephone service is good enough
Ride and Ride System			only if feasible
Cycle and Ride System			"
Park and Ride System			"
Bus Hierarchy	*		
Subscription Service	*		
provement of Public Transport Facilities			
Bus Terminals		*	
Bus-Stops/Stands	*	*	
Access to Bus-Stops	*	*	
Bus Streets		*	
Bus Priority		*	
Bus Lanes		*	
Bus Ways		*	
Car Restriction		*	
Transit Hall		*	
Bus Information System	*		
Bus Fleet	*	*	
Mini-taxi Stations	*		
Coordination of PT Terminals		*	
provement in Fare and Pricing Policy			
Zone Fare System	*		
Fare Incentive System	*		
Fare Prepayment	*		
Discount Fares for Selected Groups	*		
Premium-service-Premium-Fares	*		
rovement in Management and Operations			
Service and Maintenance Training	*		
Planning Training	*		
Control Training	*		
Other Employee Training	*		
Schedule Control	*		
roduction of Mass Transit		*	if feasible
Mass Rapid Transit		*	if feasible
Use of Railway for Commuters		*	if feasible

Table 13.1 (contd)

5.			
6.			
6. Improvement in Institutional System			
1. Systematic Regulations		*	
2. Enforcement	*	*	
3. Bus Operation Cost and Revenue Accounts	*		
4. Regional Consultative Committee	*		
5. Staggertime	*	*	
6. Queue		*	
7. Choice of School		*	
8. School Bus Association	*		
9. Factory Bus Assocation	*		
10.			
7. Improved Landuse Pattern		*	

Table 13.2 : Social, Technical and Institutional Aspects of Proposed Strategies

Specific Strategy	Social Approach	Technical Approach	Institutional Approach
Improvement of Public Transport Services	*	*	
Improvement of Public Transport Facility/ Fleet		*	
Fare Policy Improvement	*		
Improvement of Management and Operations		*	*
Application of Innovations in Bus/Mass Rapid System		*	*
Improvement of Institutional System			*
Improvement in Landuse Pattern			*

13.2 Long Term Proposals

As mentioned in section 13.1, long term public transport proposals should be based on the policies to improve the competitive edge of public vis-a-vis private vehicles in order to achieve the minimization of energy consumption, the reduction of capital investment, the more effective utilization of urban space and for better social equity.

1. Improvements in Bus Services

a) Extended Coverage

Bus routes should be expanded as quickly as possible in response to urban development. The PTLB should initiate the expansion into the proposed new towns and industrial areas.

b) Reliability and Frequency

At all times reliability, expected to be improved via the short-term plan, should be maintained. Frequency should be improved in response to demand.

c) Other Services

Free-ride in the CBD should be introduced to facilitate movement in the CBD concurrent with motor car restrictions. Dial-a-bus should be introduced in lower density areas (demands less than $40/km^2/hr$) when telephone coverage and services are improved. Cycle, and ride should also be introduced to improve access in local areas. Parking for bicycles and motorcycles should be provided to a high level of security. Ride-and-ride and park-and-ride should be considered as part of the implementation of motor car restriction schemes.

2. Improvement in Public Transport Facilities

a) Terminals

There is a need for a multi-level interchange in the CBD.

This is necessary in the long term as ground space for boarding and alighting passengers will not be sufficient. It will also facilitate the transfer between public transport modes. This complex should be developed also as good class commercial space, not only for commercial reasons, but also to attract shoppers these and minimise travel to other parts of the CBD. Taxis to Singapore should be based here. The site of the existing taxi station at Jalan Station appears suitable.

There is also a need for an interchange at the periphery of town. It is suggested that a feasibility study be carried out for a railway/taxi (both interurban and town) station/bus (trunkline and feeder) station complex north of Jalan Tampoi, adjacent to the railway track. This complex will serve as the primary location of transfers to outstation modes and also to a lesser degree, for transfers to destinations within the town.

b) Priority System, Bus Lanes, Busways

Initially streets travelled by buses should be improved. Subsequently, priority should be given to buses. When possible, bus lanes should be provided along the primary distributors. Right-of-way has already been provided for the Johor Bahru - Pasir Gudang Corridor and steps should be taken to promote the use of this busway.

3. Introduction of Mass Rapid Transit

a) Introduction of Mass Rapid Transit to replace busway.

b) Utilization of Port Access Railway for commuting.

The feasibility of these two proposals are being analysed.

4. Improvement in Institutional System

a) Regulations

In accordance with the improvements proposed, supporting regulations should be introduced and implemented.

b) Choice of School

Land surrendered for schools should be used as early as possible. There should be a policy to induce students to go to the neighbourhood school to minimise school trips.

5. Improvement in Landuse Pattern

Dispersal of Commercial centres should be encouraged to minimise travel demands on the CBD. Subcentres should provide for every day needs with the CBD providing higher level services.

APPENDICES

QUESTIONNAIRE Name of Company : _____

A. Please furnish the following data and materials

1. Bus Route Map
2. Location map of bus stops and bus stations/terminals
3. Fare structure
   - Normal fare
   - Monthly discounted fare (if any)
   - School children fare (if any)

B. Please fill up the following questionnaire sheets regarding operating characteristics :

1. Origin and Destination and Operating mileage by bus routes - Form B-1
2. Frequency and Operating hour by routes - Form B-2
3. Past trend of number of passengers, operating mileage and passenger - mileage. - Form B-3
4. Number of passengers by each route - Form B-4

C. Please fill up the Questionnaire Sheets related to Bus Fleet.

1. Past Trend of Number of buses - Form C-1
2. Number of buses - Form C-2
3. Number of buses - Form C-3

D. Please fill up the Questionnaire Sheets related to employment :

1. Number of employee by years - Form D-1
2. Racial composition of your company employee - Form D-2
3. Working hours and monthly wages - Form D-3

E. Please fill up the Questionnaire Sheets related to revenue and expenditure

1. Bus Operating revenue by year - Form E-1
2. Monthly and daily bus operating revenue - Form E-2

3. Bus operating expenditure

Form E-3

4. Capital structure of your company

Form E-4

F. If you have any comments regarding bus operation, please give us comments

Form F

Form B-1 Origin and Destination and Operating Mileage

Route	Origin	Destination	Distance	
			KM	MILE

Form B-2 FREQUENCY OF EACH ROUTE

Route No. _____ (Number of times)

TIME	Scheduled		Actual Operation		
	No. of buses	No. of trips	No. of buses	No. of trips	
4-5 a.m.					
5-6 "					
6-7 "					
7-8 "					
8-9 "					
9-10 "					
10-11 "					
11-12 afternoon					
12-1 p.m.					
1-2 "					
2-3 "					
3-4 "					
4-5 "					
5-6 "					
6-7 "					
7-8 "					
8-9 "					
9-10 "					
10-11 "					
11-12 "					
12-13a.m.					

Form B-3 Total Passengers, Bus mileage, passenger mileage in 1972 - 1980

	1972	1973	1974	1975	1976	1977	1978	1979	1980	
Total										
1) Passenger transported										
2) Bus mileage operated										
3) Passenger mileage on board										
Within Johor Bahru town										
1) Passenger transported										
2) Bus mileage operated										
3) Passenger mileage on board										
To Singapore										
1) Passenger transported										
2) Bus mileage operated										
3) Passenger mileage on board										
To Pontian										
1) Passenger transported										
2) Bus mileage operated										
3) Passenger mileage on board										

Form B-3

	1972	1973	1974	1975	1976	1977	1978	1979	1980	
To Kota Tinggi (1) Passenger transported (2) Bus mileage operated (3) Passenger mileage										
To North Specify ( ) (1) Passenger transported (2) Bus mileage operated (3) Passenger mileage										
Others Specify ( ) (1) Passenger transported (2) Bus mileage operated (3) Passenger mileage										
Others Specify ( ) (1) Passenger transported (2) Bus mileage operated (3) Passenger mileage										

Form B-4 : NO. OF PASSENGERS TRANSPORTED ON EACH ROUTE

ROUTE NUMBER	YEAR	
	1979	1980
ROUTE -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
" -		
TOTAL		

Form C-1 Number of Buses

Type of Services	Number of Bus				
	1976	1977	1978	1979	1980
Scheduled					
Factory Bus					
School Bus					
Sightseeing Bus					
Others					
				Total	

Form C-2 Bus fleet by age (as on 1.10.81)

Bus age	Number of Bus
0-1 year	
1-2	
2-3	
3-4	
4-5	
5-6	
6-7	
7-8	
8-10	
10-	
TOTAL	

Form C-3 Number of buses by capacity

Capacity	Number of Bus	
0-10		
10-20		
20-30		
30-40		
40-50		
50 & above		

Form D-1 Number of employees by year

Type of worker	1976	1977	1978	1979	1980	
Bus driver						
Bus conductor						
Engineer of Bus maintenance						
Administrative						
The others						
Total						

Form D-2 Racial composition of your company employees

Race	1976	1977	1978	1979	1980	
Malays						
Chinese						
Indians						
Others						
Total						

Form D-3 Working hours and monthly wages

	Number of working hours per month	Wage or salary per month (incl.EPF,SOCSO)
Bus driver		
Bus conductor		
Engineer		
Administrative		
Others		

Form E - 1

Bus Operating Revenue by Year

Year	1976	1977	1978	1979	1980	
Scheduled Bus Revenue						
Fare Revenue						
Others (specify)						
Factory Bus Revenue						
School Bus "						
Sightseeing Bus Revenue						
Others (specify)						
Total						

Form E-2 Monthly and daily bus operating revenue

MONTH / DAY	MARCH	JULY	DECEMBER
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

Amount of monthly Fare Revenue in 80'	
Month	Revenue
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Form E-3 Bus operating Expenditure

	1976	1977	1978	1979	1980	
Total Expenses						
1. Fuel and oil						
2. Tyres						
3. Maintenance and Repair						
4. License fee						
5. Insurance						
6. Wage of Labour						
7. Vehicle depreciation						
8. Interest						
8-1. short term loan						
8-2. long term loan						
9. Other Expenses						
Profit						

Form E-4

Capital Structure of your company in 1980

1. Authorised capital _____

2. Issued capital _____

3. Malay portion of issued capital _____

4. Long term loans _____

Form F

1-1 What are the main problems faced by present day bus transport operators in Johor Bahru?

1-2 Do you have any specific problems along the bus routes?

1-3 At which location of the road network do problems often occur at present?

1-4 Do you have any suggestion for the change of the present bus network?

1-5 How are the routes determined and what are the problems encountered in changing or setting up new routes?

1-6 Will there be any new bus-route-plan in the near future and do you intend to introduce any new routes and to abolish certain routes?

BUS-USER INTERVIEW: INSTRUCTIONS

A General Instructions

1. This interview is to find out the characteristics and opinions of bus-users. It is to be conducted at bus-stops.
2. For stations 1 to 4, interview respondents going in the direction away from town. For other stations, interview respondents going in the direction of town. For all station, interview respondents waiting to take a bus.

B Schedule

1. The surveys are to be conducted on ___ and _____
2. The Schedule is as follows:-

	Stations	Time
1st day	1. Jln Ah Fook. UMNO 2. Jln Ah Fook. Market 3. Depan MPJP	2 shifts: 6 a.m. to 3 p.m. 3 p.m. to 12 midnight
2nd day	4. In front of convent 5. Jln Tebrau Junction with Jln Utama 6. Jln Tebrau opposite Police Depot 7. Jln Scudai near Jln Wasina 8. Jln Abdul Samad 9. Ulu Tiram 10. Kulai 11. Jln Tampoi near Jln Datin Halamah 12. Kota Tinggi	1 shift: 7 a.m. to 6 p.m.

3. Enumerators are to report at 8.30 at the office on the third day to submit the completed questionnaires

C Quota and Sampling

1. Each interviewer is required to return 50 questionnaires for each station,

   Eg. The enumerator on duty from 6.00 a.m. to 3.00 p.m. at Station 1 on the is expected to return 50 questionnaires. The same is expected of the enumerator from 3.00 p.m. to 12.00 p.m.
   Eg. The enumerator on duty at station 4 on the from 7.00 a.m. to 6.00 p.m. is expected to return 50 questionnaires

   The 50 questionnaires returned must be duly completed. Incomplete questionnaires will not counted.

2. Enumerators are to report at 8.30 a.m. at the office on 1st October to submit the completed questionnaires.

BUS-STOP INTERVIEW

URBAN TRANSPORT MASTER PLAN STUDY
for the
JOHOR BAHRU CONURBATION

Interviewer's Name:

Sheet No.

0.1 Location of bus-stop

0.2 Time of Interview

1.1 AGE of Respondent

0 ☐ 7-14
1 ☐ 15-19
2 ☐ 20-29
3 ☐ 30-39
4 ☐ 40-49
5 ☐ 50 and above

1.2 SEX

1 ☐ Male
2 ☐ Female

1.3 OCCUPATION

0 ☐ Administration and Managerial
1 ☐ Professional and Technical
2 ☐ Clerical and related
3 ☐ Sales
4 ☐ Service
5 ☐ Factory, Construction, Transportation and related
6 ☐ Agriculture, Animal Husbandry, Forestry and Fishery
7 ☐ Student
8 ☐ Housewife
9 ☐ Others

1.4 Do you have a car which you can use?

1 ☐ Yes
2 ☐ No

1.5 Do you have a motorcycle which you can use?

1 ☐ Yes
2 ☐ No

2.1 TRIP PURPOSE

1 ☐ To work
2 ☐ To school
3 ☐ Business Engagement
4 ☐ To home
5 ☐ Shopping
6 ☐ Recreation
7 ☐ Religious Purpose
8 ☐ Social Visit
9 ☐ Others

2.2 DESTINATION

0 ☐ Residence
1 ☐ Government and Private Office
2 ☐ Retail and Wholesale Shops
3 ☐ Factory
4 ☐ Transport Facility
5 ☐ Educational Institution
6 ☐ Religious and Social Institution
7 ☐ Agriculture
8 ☐ Parks and Recreation
9 ☐ Others

2.3 USE OF BUS per week (round-trips)

1 ☐ 1-2 times
2 ☐ 3-4 times
3 ☐ 5-6 times
4 ☐ everyday
5 ☐ twice a day
6 ☐ more than twice a day

2.4 How far is your usual bus-stop from your house?

2.5 How long do you usually have to wait for the bus you want?(minutes)

1 ☐ 0-4 minutes	☐ 1
2 ☐ 5-9	☐ 2
3 ☐ 10-14	☐ 3
4 ☐ 15-19	☐ 4
5 ☐ 20-24	☐ 5
6 ☐ 25-30	☐ 6
7 ☐ more than 30	☐ 7

2.6 How long do you expect your trip to be (from boarding to alighting) in minutes?

0 ☐ 0-9
1 ☐ 10-19
2 ☐ 20-29
3 ☐ 30-39
4 ☐ 40-49
5 ☐ 50-59
6 ☐ 60-69
7 ☐ 70-79
8 ☐ 80-89
9 ☐ more than 90

3.1 Why don't you use a taxi?

1 ☐ too expensive
2 ☐ have to wait long for taxi
3 ☐ taxi never passes my house
4 ☐ Others: specify _____

3.2 Ask only if respondent has motorcycle
Why don't you use your motorcycle?

1 ☐ under repair
2 ☐ riding motorcycle is dangerous
3 ☐ too tired to ride motorcycle
4 ☐ rain
5 ☐ Others: specify _____

3.3 Ask only if respondent has car
Why don't you use your car?

1 ☐ under repair
2 ☐ no parking at destination
3 ☐ parking too far
4 ☐ traffic congestion
5 ☐ Others: specify _____

4.1 Do you have to transfer to get to your destination or return to your origin?

1 ☐ no
2 ☐ once
3 ☐ twice

4.1.1 Where do you transfer? Specify:

_____

_____

4.2 Difficulties at bus-stop

1 ☐ no shelter
2 ☐ no bench
3 ☐ long wait
4 ☐ crowded
5 ☐ rushing for bus
6 ☐ route/schedule not shown
7 ☐ Others: specify

_____

_____

4.3 Difficulties inside bus

1 ☐ no seat/ have to stand
2 ☐ overcrowded/packed
3 ☐ getting in
4 ☐ getting out
5 ☐ hot
6 ☐ dirty
7 ☐ Others: specify _____

4.4 Bus speed

1 ☐ too slow; takes too long
2 ☐ just nice
3 ☐ too fast; dangerous
4 ☐ jerky

4.5 Bus fare

1 ☐ too high
2 ☐ just nice

HOME INTERVIEW SURVEY : PUBLIC TRANSPORT	URBAN TRANSPORT MASTER PLAN STUDY for the JOHOR BAHRU CONURBATION	Interviewer's Name:	Interview No. (household)	Sheet No.

A. HOUSEHOLD INFORMATION

0.1 Number of Persons in your Household

	All Members	7 years and above
Male		
Female		
Total		

0.2 Household Income

1☐ Less than $100
2☐ $100-$299
3☐ $300-$599
4☐ $600-$999
5☐ $1000-$1999
6☐ $2000-$4999
7☐ $5000 and above

0.3 Occupation of Household Head

0☐ Professional and Technical
1☐ Administrative and Managerial
2☐ Clerical and related
3☐ Sales
4☐ Service
5☐ Factory,Construction,Transport
6☐ Agriculture,Forestry,Fishery, Animal Husbandry
7☐ Student
8☐ Housewife
9☐ Others: specify _____

0.4 Number of Cars

0☐ none
1☐ one
2☐ two
3☐ more than two

0.5 Number of Motorcycles owned by household

0☐ none
1☐ one
2☐ two
3☐ more than 2

0.6 Distance from house to nearest bus-stop (in minutes)

1☐ 5 minutes
2☐ 10 minutes
3☐ 15 minutes
4☐ 20 minutes
5☐ more than 20

Zone No.

Distance to bus-stop

☐ 0-100m
☐ 100-300m
☐ 300-500m
☐ 500-1000m
☐ more than 1000m

HOME INTERVIEW SURVEY : PUBLIC TRANSPORT

URBAN TRANSPORT MASTER PLAN STUDY
for the
JOHOR BAHRU CONURBATION

Interview No. | Sheet No.

B. PERSON INFORMATION

1.1 SEX

1☐ Male
2☐ Female

1.2 AGE GROUP

1☐ Below 20
2☐ 20-29
3☐ 30-39
4☐ 40-49
5☐ 50 and above

1.3 OCCUPATION

0☐ Administrative and Managerial
1☐ Professional and Technical
2☐ Clerical and related
3☐ Sales
4☐ Service
5☐ Factory, Construction and Transport
6☐ Agriculture, Animal Husbandry, Fishery, Forestry
7☐ Student
8☐ Housewife
9☐ Others: Specify _____

1.5 Please list all the trips you made last week to each of the destinations on the left by purpose and according to vehicle used.

Place	Purpose	CAR	M/CYCLE	TAXI	PIRATE TAXI	SCHEDULED BUS	FACTORY/ SCHOOL BUS	OTHERS
JOHOR BAHRU TOWN	Work							
	School							
	Others							
SINGAPORE	Work							
	School							
	Others							
SENAI	Work							
	School							
	Others							
PASIR GUDANG	Work							
	School							
	Others							
KOTA TINGGI	Work							
	School							
	Others							
PONTIAN	Work							
	School							
	Others							
OTHERS	Work							
	School							
	Others							
Sub-total	Work							
Sub-total	School							
Sub total	Others							
TOTAL								

2.1 Do you have a car or motorcycle which you can use?

☐No ☐Yes (go to 3.1)

2.2 If not, do you plan to buy a car or motorcycle in the near future?

car ☐No(go to 2.5) ☐Yes
m/cycle ☐No(go to 2.5) ☐Yes

2.3 If you plan to buy a car or motorcycle, list not more than 2 reasons why

1☐ inconvenient to take taxi or bus
2☐ too expensive to use taxi
3☐ status symbol
4☐ Others: Specify _____

2.4 How much must a person earn to buy a car or motorcycle?

car $ _____ per month

motorcycle $ _____ per month

2.5 If you don't plan to buy a car or motorcycle, list not more than 3 reasons why.

1☐ you don't travel much
2☐ public transport is adequate
3☐ car is expensive
4☐ motorcycle is expensive
5☐ Others: Specify _____

3.1 Main mode of daily transport (see from 1.5)

0☐ Walking
1☐ bicycle
2☐ motorcycle(go to 3.2)
3☐ car(go to 3.2)
4☐ taxi(go to 3.3)
5☐ school/factory bus
6☐ [illegible]
7☐ [illegible]
8☐ [illegible]
9☐ [illegible]

3.2 Why do you use car/motorcycle? (List not more than 3 reasons)

1☐ can afford it
2☐ air-conditioning
3☐ can use anytime
4☐ don't have to walk to take bus or taxi
5☐ don't have to wait for taxi or bus
6☐ dont't have to share taxi
7☐ others: specify _____

3.3 Why do you take taxi instead of bus? (list not more than 4 reasons)

1☐ shorter walk from house
2☐ no need to walk to destination
3☐ no bus service in the area
4☐ don't have to wait so long
5☐ taxi is not so crowded as bus
6☐ taxi fare is not so expensive
7☐ Others: specify _____

3.4 Why do you take bus instead of taxi? (list only one)

1☐ [illegible]
2☐ bus is not inconvenient
3☐ others: specify _____

4. What difficulties do you face using bus?

HOUSE TO BUS-STOP

4.1
1 ☐ too far → how many minutes walk? 4.1.1 — 1 ☐ 0-4, 2 ☐ 5-9, 3 ☐ 10-14, 4 ☐ 15-19, 5 ☐ 20-24, 6 ☐ 25-29, 7 ☐ 30 & above
2 ☐ hot
3 ☐ rain

AT BUS-STOP

4.2 (list no more than 3)
1 ☐ no bus-stop sign
2 ☐ bus-stop sign not clear
3 ☐ no shelter
4 ☐ no place to sit
5 ☐ bus stop is dirty
6 ☐ bus-stop needs repair

4.3
1 ☐ route, schedule not shown

4.4
1 ☐ bus does not stop
2 ☐ bus not on time
3 ☐ long wait → 1 ☐ 0-4, 2 ☐ 5-9, 3 ☐ 10-14, 4 ☐ 15-19, 5 ☐ 20-24, 6 ☐ 25-29, 7 ☐ 30 & above

INSIDE BUS

4.5
1 ☐ only one door for both exit and entrance
2 ☐ door always blocked with people
3 ☐ passage blocked with too many people standing

4.6
1 ☐ cannot get seat/ have to stand
2 ☐ too many people standing
3 ☐ conductor/driver rude and impatient

4.7
1 ☐ hot
2 ☐ dirty
3 ☐ smoky
4 ☐ others: specify _____

SPEED

4.8
1 ☐ too fast
2 ☐ just nice
3 ☐ too slow
4 ☐ too jerky

FARE

4.9
1 ☐ too high
2 ☐ just nice

4.10
no central bus terminal 1 ☐ yes 2 ☐ no

5. How do you feel about the following suggestions for improving the bus service?

5.1
Bus-stops nearer house: 1 ☐ no need, 2 ☐ yes, 3 ☐ strongly yes
5.1.1 What is a comfortable walking distance? 1 ☐ 0-4, 2 ☐ 5-9, 3 ☐ 10-14

5.2
better bus-stops: 1 ☐ no, 2 ☐ yes, 3 ☐ strongly yes
5.2.1 Are you willing to pay higher fare for better bus-stops? 1 ☐ strongly no, 2 ☐ no, 3 ☐ yes, 4 ☐ strongly yes

5.3
more frequent service: 1 ☐ no, 2 ☐ yes, 3 ☐ strongly yes
5.3.1 how frequent? 1 ☐ 5 mins, 2 ☐ 10 mins, 3 ☐ 15 mins, 4 ☐ 20 mins

5.4
more routes: 1 ☐ no, 2 ☐ yes
5.4.1 1 ☐ more routes in residential area, 2 ☐ by-passing town centre

5.5
bigger bus: 1 ☐ no, 2 ☐ yes

5.6
standee bus: 1 ☐ no, 2 ☐ yes

5.7
air-condition bus: 1 ☐ no, 2 ☐ yes → Are you willing to pay higher fare? 1 ☐ no, 2 ☐ 10 cents, 3 ☐ 20 cents, 4 ☐ 30 cents

5.8
faster: 1 ☐ no, 2 ☐ yes

5.9
slower: 1 ☐ no, 2 ☐ yes

5.10
one rate for all distances: 1 ☐ no, 2 ☐ yes → ☐ 30 cents, ☐ 40 cents, ☐ 50 cents, ☐ 60 cents

5.11 Of the above, list two suggestions you feel are most important
☐ 5.1 ☐ 5.2 ☐ 5.3 ☐ 5.4 ☐ 5.5 ☐ 5.6
☐ 5.7 ☐ 5.8 ☐ 5.9 ☐ 5.10

6 What difficulties do you face using taxi?

1 ☐ expensive
2 ☐ no fixed fare/meter not used
3 ☐ taxi picks up other passengers
4 ☐ taxi in poor condition
5 ☐ difficulty in hailing taxi in town
6 ☐ difficulty in hailing taxi in residential areas
7 ☐ Others: _____

7 How do you feel about the following suggestions for improving taxi service?

7.1 More taxis to serve residential areas
1 ☐ no 2 ☐ yes 3 ☐ strongly yes

7.2 Setting up taxi stations in housing estate
1 ☐ no 2 ☐ yes 3 ☐ strongly yes

7.3 System to phone for taxis
1 ☐ no → 7.3.1 Why no? 1 ☐ more expensive, 2 ☐ unreliable, 3 ☐ others
2 ☐ yes
3 ☐ strongly yes

7.4 Air-conditioned taxis with fare increased by 20 cents
1 ☐ no 2 ☐ yes 3 ☐ strongly yes

7.4 Air-conditioned taxis with fare increased by 40 cents
1 ☐ no 2 ☐ yes 3 ☐ strongly yes

7.5 Air conditioned taxis with fare increased by 60 cents
1 ☐ no 2 ☐ yes 3 ☐ strongly yes

7.6 No picking up other passengers
1 ☐ no 2 ☐ yes 3 ☐ strongly yes

7.7 If no, why not?
1 ☐ more expensive 2 ☐ others: _____

RAILWAY STATION INTERVIEW : INSTRUCTIONS

A General

1. The purpose of this interview survey is to find out the characteristics and opinions of passengers.

2. The survey is to be conducted on _____ and _____ October.

B Sample

1. Interviews will be carried out at the following times for 2 days.

up to 9.15	= 9.15 train	= ordinary train, departing
11.21 onwards	= 11.21 train	= ordinary train, arriving
12.20 onwards	= 12.20 train	= express train, arriving
15.00 to 1.41	= 13.41 train	= express train, departing

2. For each arriving train, every enumerator is to be interview 2 respondents. For each departing train, every enumerator is to interview 3 respondents. A total of 20 completed interview (12 departing, 8 arriving) is to be returned to the office at 3.00 on the second day.

RAIL USER SURVEY
Departing Passenger

Interviewer's Name:

1.Type of Service ☐ Express ☐ Ordinary

2. AGE	less than 20
	20-29
	30-39
	40-49
	50&above
3.SEX	Male
	Female
4. OCCUPATION	Admin.&Managerial
	Professional&Technical
	Clerical&related
	Sales
	Service
	Factory,Construction, Transportation&related
	Agriculture,Animal Husbandry,Forestry Fishery
	Student
	Housewife
	Other
5. ORIGIN	Johor Bahru
	Pontian
	Kota Tinggi
	Kulai
	Senai
	Other
6.TRANSPORT FROM ORIGIN	Private Car
	Taxi
	Bus
	Walk
	Other
7.INCONVENIENCES IN THE TRAIN	Poor quality food
	Expensive food
	Too many stops
	Too slow
	Train not punctual
	Noisy
	No entertainment
	Uncomfortable seats
	Others:specify
8.INCONVENIENCES IN THIS STATION	Taxi Station too far
	Bus Station too far
	Bus routes not shown
	No shelter
	Not enough seats
	Parking problems
	Dirty Toilets
	Others:specify
9.SIZE OF GROUP	alone
	2 or 3
	4 or more

RAIL USER SURVEY

Arriving Passenger

1.Type of Service ☐ Express ☐ Ordinary

Interviewer's Name:

2.AGE	less than 20	
	20-29	
	30-39	
	40-49	
	50&above	
3.SEX	Male	
	Female	
4.OCCUPATION	Admin.&Managerial	
	Professional&Technical	
	Clerical&related	
	Sales	
	Service	
	Factory,Construction, Transportation&related	
	Agriculture,Animal Husbandry,Forestry Fishery	
	Student	
	Housewife	
	Other	
5.DESTINATION	Johor Bahru	
	Pontian	
	Kota Tinggi	
	Kulai	
	Senai	
	Other	
6. TRANSPORT TO DESTINATION	Private Car	
	Taxi	
	Bus	
	Walk	
	Other	
7.INCONVENIENCES IN THE TRAIN	Poor quality food	
	Expensive food	
	Too many stops	
	Too slow	
	Train not punctual	
	Noisy	
	No entertainment	
	Uncomfortable seats	
	Others:specify	
8.INCONVENIENCES IN THIS STATION	Taxi Station too far	
	Bus Station too far	
	Bus routes not shown	
	No shelter	
	Not enough seats	
	Parking problems	
	Dirty Toilets	
	Others:specify	
9. SIZE OF GROUP	alone	
	2 or 3	
	4 or more	

AIRPORT INTERVIEW : INSTRUCTIONS

A General

1. The purpose of this survey is to collect passenger characteristics and opinion.

2. The survey is to be conducted on ____ and ____ October.

3. Transport to the airport will be provided.

B Sample

1. The interview time for both days shall be from 2pm to 9pm.

2.00pm	arrive at airport
2.00-3.10pm	interview departing passengers on MH 102
3.10pm onwards	interview arriving passengers on MH 101
up to 7.30pm	interview departing passengers on MH 670
7.30pm onwards	interview arriving passengers on MH 673

2. For each departing flight, each enumerator must complete 3 questionnaires, for each arriving flight 2 questionnaires, ie. a total of 20 questionnaires (8 arriving, 12 departing) for 2 days.

AIRPORT INTERVIEW FORM

(Arriving Passengers)

Introduction:- Excuse me sir, we are conducting a survey for the Johor Bahru Urban Transport Study. Could we ask you a few question?	Instruction:- If prospective respondent asks more information, please oblige.
1. What is your occupation sir?	Tick the appropriate column
2.	Observe and check
3. Where did you start your plane trip, sir?	Tick the appropriate column
4. Where are you going to, sir?	Tick the appropriate column
5. What means of transport will you use to go to your destination	Tick the appropriate column
6. Why are you making this trip?	Tick the nearest answer
7. How many persons are travelling in your group ?	Tick the appropriate column
8. An express train service to J.B. (20 minutes) and Singapore (50 minutes) may be commenced. Transit services like baggage transfer, advance booking and no customs and immigration checking at the causeway would be available. Would you use the service if it costs:- less than bus - fare same as bus fare more than bus fare but less than taxi fare more than taxi	Tick only if answer is yes

AIRPORT INTERVIEW
(Departing Passengers)

1.OCCUPATION	Administration & Managerial
	Professional & Technical
	Clerical & related
	Sales
	Service
	Factory, Construction,
	Transport & related
	Agriculture, Animal
	Husbandry, Forestry, Fishing
	Student
	Housewife
	Others
2.SEX	Male
	Female
3. DESTINATION	Malacca
	Kuala Lumpur
	Ipoh
	Penang
	Alor star
	Kuantan
	K. Trengganu
	East Malaysia
	Overseas
4. ORIGIN	Singapore
	Johor Bahru
	Kluang
	Kulai/Senai
	Kota Tinggi
	Others
5.PURPOSE	Work/Business
	Holiday
	Home
	Others
6.TRANSPORT FROM AIRPORT	Private Car
	Hire
	Taxi
	Shared Taxi
	MAS bus
	Others
7.GROUP SIZE	alone
	2 or 3
	4 - 5
	5 and above
8.EXPRESS TRAIN FROM J.B. AND SINGAPORE	No
	same than bus
	more than bus
	less than taxi
	more than taxi

7 to 8	TIME
8 to 9	
9 to 10	
10 to 11	
11 to 12	
12 to 1	
1 to 2	
2 to 3	
3 to 4	
4 to 5	
5 to 6	
less than 20	AGE
20 to 29	
30 to 39	
40 to 49	
50 and above	
Admin and Managerial	OCCUPATION
Prof and Technical	
Clerical and related	
Sales	
Service	
Factory, Const, Transp,etc	
Agri, animal, forest,fish	
Student	
Housewife	
Other	
Johor Bahru	DESTINATION IN STUDY AREA
Pontian	
Kota Tinggi	
Kulai	
Senai	
Masai	
Other	
Work	PURPOSE GOING TO SINGAPORE
School	
Business Engagement	
Home	
Shopping	
Recreation	
Religious	
Social	
Other	

BUS OPERATION SURVEY = INSTRUCTION

A General

1. The objective of this survey is to find out the passenger load and travel time of buses.

2. Passenger Load will be surveyed on the 1st day and travel time on the second.

3. For the two survey days, enumerators are not required to report to the office. They will however have to be at the bus terminal at the required times.

4. The bus-fare while on duty will be re-imbursed, You must keep your bus-ticket receipts as evident.

B Routes

1. The following route numbers and destinations are to be covered

Destination	Route No.
1. Century Gardens	51
2. Kg. Melayu	211
3. -	8
4. Tampoi	14
5. Kulai	5
6. Pontain	6
7. Kota Tinggi	41

2. The duration of survey for each day is

7.00 a.m. to 9.00 a.m.
11.30 a.m. to 1.30 p.m.
4.30 p.m. to 6.30 p.m.

These are minimum hours. For regional routes Nos 5 - 7 there must be a minimum of one outgoing or incoming trip in each time period. For town routes, ie Nos 1 - 4, there should be a minimum of one one outgoing and one returning trip in each time period

3. Enumerators should check the schedule of the bus routes that are assigned and to board the assigned buses at the terminal before 7.00 a.m., 11.30 a.m. and 4.30 p.m. respectively.

PENGKAJIAN OPERATION BAS - Cara-Cara

A Umum

1. Objektif pengkajian ini ialah untuk mencari jumlah penumpang dan masa perjalanan untuk bas.

2. Jumlah penumpang akan dikaji pada hari yang pertama dan masa perjalanan pada hari yang kedua.

3. Pembanci tidak di perlu untuk datang berlapor ke office pada kedua-dua hari yang dimaksudkan. Oleh kerana mereka mesti mengumpul di perhentian bas di waktu yang diperlukan.

4. Tambang bas untuk tujuan kajian ini akan dibayar balik. Resit-resit tiket-tiket bas mesti ditunjukkan sebelum tambang boleh dibayar.

B Perjalanan

1. Nombor-nombor perjalanan bas dan destinasinya yang akan dikaji.

Destinasi	No. bas
1. Century Gardens	51
2. Kg. Melayu	211
3. -	8
4. Tampoi	14
5. Kulai	5
6. Pontain	6
7. Kota Tinggi	41

2. Masa untuk hari-hari pengkajian ialah

   i) 7.00 pagi ke 9.00 pagi

   ii) 11.30 pagi ke 1.30 petang

   iii) 4.30 petang ke 6.30 petang

   Ini ialah masa-masa yang tertentu. Untuk perjalanan luar bandar yang bernombor 5 - 7, sekurang-kurangnya mesti ada satu perjalanan pergi atau pulang di dalam satu masa yang tertentu.

3. Pembanci memereksa waktu jadual perjalanan bas yang diberi kepadanya dan menumpang bas-bas tersebut di perhentian bas sebelum pukul 7.00 pagi 11.30 pagi dan 4.30 petang.

BUS OPERATION SURVEY: LOAD FACTOR

Interviewer: _____

1. Bus Route: _____ 2. From: _____ 4. Starting Time: _____

3. To: _____ 5. Ending Time: _____

Bus-stop No.	Identifiable Feature	Passengers in	Passengers Out	Net Change	Cumulative No.

BUS OPERATION SURVEY: TRAVEL TIME
Interviewer: ____________________

1. Route: ______________ 2. From: ____________________

3. To: ____________________

Bus-stop No.	Identifiable Feature	Time Start	Time Stop	Travel Time	Stop-Time
			Total		
			Percentage		

BUS OPERATION SURVEY

Counters: Morning Evening

A:_____ A:_____ 2. Date:_____

B:_____ B:_____ 3. Location of Bus-stop:_____

_____

Time	Number of Passengers Boarding Each Bus	Number of Passengers Alighting From Each Bus	Total Boarding by Hour	Total Alighting by Hour
0700-0800				
0800-0900				
0900-1000				
1000-1100				
1100-1200				
1200-1300				
1300-1400				
1400-1500				
1500-1600				
1600-1700				
1700-1800				
1800-1900				
1900-2000				
2000-2100				
2100-2200				
2200-2300				
Total				

INTERVIEWER'S NAME: _____

6 to 7 am
7 to 8 am
8 to 9 am
9 to 10 am
10 to 11 am
11 to 12 am
12 to 1 pm
1 to 2 pm
2 to 3 pm
3 to 4 pm
4 to 5 pm
5 to 6 pm
6 to 7 pm
7 to 8 pm
8 to 9 pm
9 to 10 pm

SEX	Male
	Female
NATIONALITY	Malaysian
	Singaporean
	Others
AGE	Less than 20
	20 to 29
	30 to 39
	40 to 49
	50 and above
OCCUPATION	Admin and Managerial
	Prof. and Technical
	Clerical and related
	Sales
	Service
	Factory, Const, Transp, Etc
	Agri, animal, forest, fish
	Student
	Housewife
	Other
DESTINATION IN STUDY AREA	Johor Bahru
	Pontian
	Kota Tinggi
	Kulai
	Desaru
	Others - South Johor
	Others - outside South Johor
PURPOSE TO ENTER MALAYSIA	Work
	School
	Business Engagement
	To Home
	Shopping
	Recreation
	Social
	Others (Specify)
PURPOSE IN SINGAPORE	Work
	School
	Business Engagement
	To Home
	Shopping
	Recreation
	Social
	Others (Specify)
RESIDENCE	In Singapore
	In Malaysia

MONTHLY DISCOUNT FARE AND CARD

Monthly Bus Fare for School Students

Kg. Melayu - J.B = $12.00

Kg. Melayu - Polis Depot = $11.00

Kg. Melayu - Kg. Dato Sulaiman Menteri = $7.00

Kg. Dato Sulaiman Menteri - J.B. = $1.00

Kg. Dato Sulaiman Menteri -Polis Depot = $10.00

Kempas - J.B. = $12.00

Kempas - Larkin Bomba = $10.00

Kempas - Jln. Ngee Heng = $11.00

Larkin Bomba - J.B. = $9.00

Larkin Jaya - J.B. = $10.00

Larkin Jaya - J.B. = $11.00

Larkin Jaya - Larkin Bomba = $8.00

Century Garden - J.B = $9.00

A Sample of Monthly Ticket for Students.

T. HAKKIM SDN. BHD.

Bilik No. 4, 5 & 6 Tingkat 3, Bangunan UMNO
Johor Bahru. Tel: 23097

TIKIT BULANAN PENUNTUT

*Tambang $*_____ *No.* .....
H/B. diterima.....
*B.K. Muka*_____
Nama _____ *dibenarkan*
*menaiki bas dari*_____ *dan* .....
*daripada*_____ *hingga* .....

T. HAKKIM SDN. BHD.

T.T. Pemilik Tikit
(Syarat-syarat disebelah)

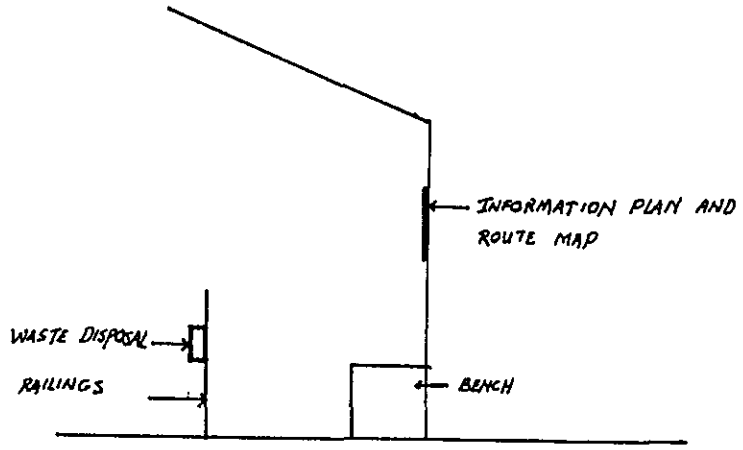
Dikeluarkan oleh

HARI JUMAAT DAN SABTU TIDAK BOLEH DI GUNAKAN

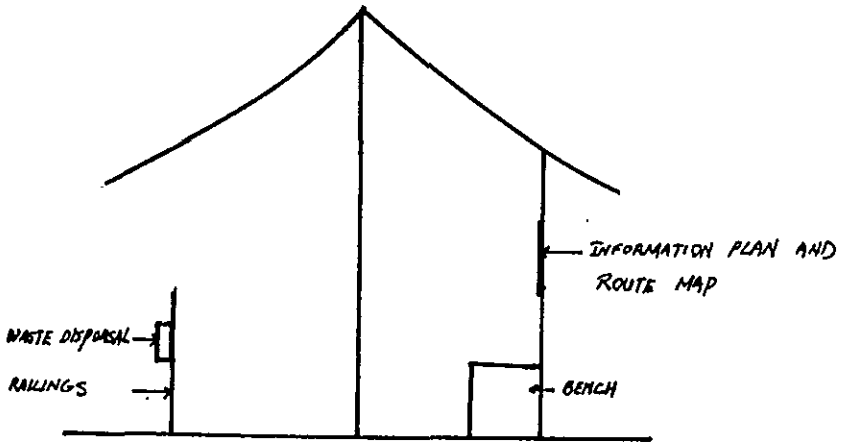
PERGI		SYARAT-SYARAT	BALIK	
1	17	1. Tikit ini hanya boleh digunakan pada hari-hari sekolah sais dan tidak boleh ditukar milik.	17	1
2	18	2. Hendaklah ditunjukkan kepada yang berkenaan apabila diminta	18	2
3	19	3. Tidak dibenarkan menaiki lebih dari satu perjalanan dalam satu hala.	19	3
4	20	4. Pihak syarikat berhak menarik balik atau mem batalkan tikit ini bila-bila masa.	20	4
5	21		21	5
6	22	PHOTO	22	6
7	23		23	7
8	24		24	8
9	25		25	9
10	26		26	10
11	27		27	11
12	28		28	12
13	29		29	13
14	30		30	14
15	31		31	15
16				16

IMPROVED BUS-STAND DESIGN

TYPE 'A'



TYPE 'B'



TYPE 'C'