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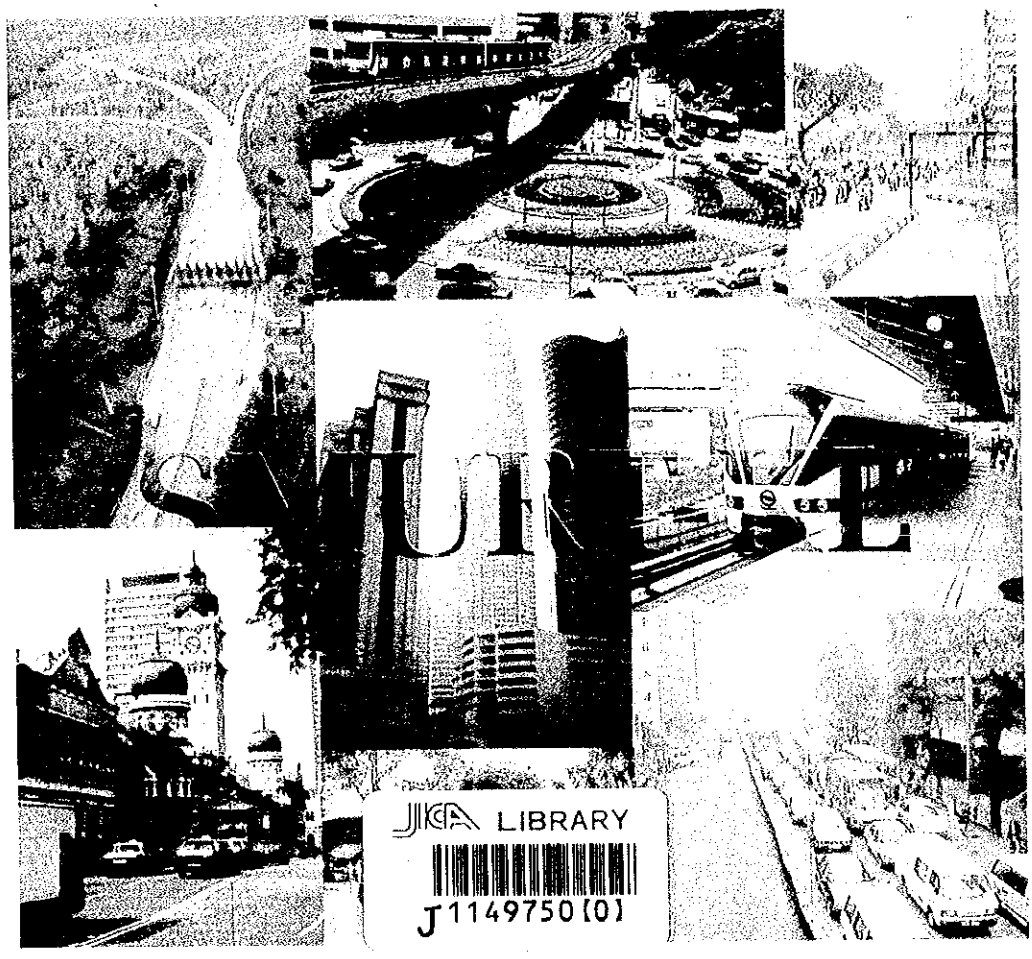
No. 2

THE FEDERAL TERRITORY DEVELOPMENT AND
KLANG VALLEY PLANNING DIVISION
PRIME MINISTER'S DEPARTMENT
GOVERNMENT OF MALAYSIA

JAPAN INTERNATIONAL
COOPERATION AGENCY(JICA)

A STUDY ON INTEGRATED URBAN TRANSPORTATION STRATEGIES FOR ENVIRONMENTAL IMPROVEMENT IN KUALA LUMPUR

FINAL REPORT
VOLUME I



FEBRUARY 1999

PACIFIC CONSULTANTS INTERNATIONAL
SUURI-KEIKAKU CO.,LTD

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The exchange rates applied in this Study are:

US$ 1.00 = RM 3.80

US$ 1.00 = Japanese Yen 135.35

(as of the end of September 1998)

PREFACE

In response to a request from the Government of Malaysia, the Government of Japan decided to conduct a Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (SMURT-KL) and entrusted the study to Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Kiyoshi Yasukawa, and which consist of Pacific Consultants International and Suuri-Keikaku Co., Ltd., to Malaysia, three times between March 1997 and February 1999. In addition, JICA set up an advisory committee headed by Dr. Takeshi Kurokawa, Professor of Interdisciplinary Graduate School of Science & Engineering, Tokyo Institute of Technology between March 1997 and February 1999, which examined the study from specialist and technical pint of view.

The team held discussions with the officials concerned of the Government of Malaysia and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

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

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Malaysia for their close co-operation extended to the study.

February 1999

Kimio Fujita
President
Japan International Co-operation Agency

February 1999

Mr. Kimio Fujita
President
Japan International Cooperation Agency
Tokyo, Japan

Dear Mr. Fujita,

Letter of Transmittal

We are pleased to formally submit herewith the final report of the "Study on Integrated Urban Transport Strategies for Environmental Improvement in Kuala Lumpur (SMURT-KL)".

This report compiles integrated urban transport strategies for improved urban transport environment of the Kuala Lumpur metropolitan area, including necessary policy measures and strategies and a master plan of facility development.

We owed a lot to many people for the accomplishment of the Study. First, we would like to express our sincere gratitude and appreciation to all those their kind assistance and co-operation to the Study team, in particular, relevant officials of the Federal Territory Development, the counterpart agency.

We also acknowledge all the officials of your agency, the JICA Advisory Committee, Embassy of Japan in Malaysia and Ministry of Foreign Affairs.

We wish the report would be able to contribute really to appropriate policies and measure for the improvement of urban transport environment of the Kuala Lumpur metropolitan area.

Very truly yours,

K. Yasukawa

Kiyoshi Yasukawa
Team Leader
SMURT-KL

List of Abbreviations

		Chapter
CBD	Central Business District	11
LEV	Low Emission Vehicle	11
NGV	Natural Gas Vehicles	11
API	Air Pollution Index	11
EDMC	Energy Data and Modelling Center (Japan)	11
KL	Kuala Lumpur	11
GDP	Gross Domestic Product	11
SRFA	Sub-Regional Fire-fighting Arrangement	11
AWASI	Area Watch and Sanction Inspection	11
SIRIM	Standards and Industrial Research Institute of Malaysia	11
CPA	Central Planning Area	11
CNG	Compression Natural Gas	11
HPU	Highway Planning Unit	14
LRT	Light Rapid Transit	14
BOT	Build-Operate-Transfer	14
IRR	Inner Ring Road	9
MRR	Middle Ring Road	9
ETC	Electronic Toll Collection	9
PCU	Passenger Car Unit	9
MSC	Multi-media Super Corridor	11
SCATS	Sydney Coordinated Adaptive Traffic System	9
FIRR	Financial Internal Rate of Return	13
EIRR	Economic Internal Rate of Return	13
KTMB	Keretapi Tanah Melaya Berhad	13
PLUS	Project Lebuhraya Utara Sulatan	13
IDC	Infrastructure Development Corporation	13
STAR	Sistem Transit Aliran Ringan	13
PUTRA	Projek Usahasama TRansit Automatic Sdn. Bhd.	13
PRT	People-mover Rapid Transit	13

A Study on Integrated Transportation Strategies for Environmental Improvement in Kuala Lumpur

1 Background

The city of Kuala Lumpur (KL) is the capital of Malaysia, with an area of 243 km^2 and a population of about 1.4 million. The GDP of KL accounts for 13% of the total of Malaysia. As for urban transportation, motorcycles and passenger cars make up 60% of the total trips, which means the City's transport system largely depends on private modes of transport. Vehicle ownership has exceeded 500 million vehicles including motorcycles, indicating 375 vehicles per thousand inhabitants, a very high ratio as for a developing country. Such a rapid growth of urbanisation and motorisation has resulted in a deterioration of the environment, such as chronic traffic congestion, air pollution, frequent occurrence of traffic accidents, and so forth.

As such, the Government of Malaysia has improved the urban transportation system in KL in many ways such as the provision of new highways, double tracking / electrification of KTM railways, and construction of LRT System (I) and (II). In the formulation of these plans, JICA (the Japan International Cooperation Agency) assisted the Government of Malaysia with the Master Plan in 1987 and the subsequent feasibility study. However, in order to solve the problems in a more and more complicated transportation environment, it was considered necessary to formulate integrated urban transportation strategies which were comprehensively studied from both the hard and soft aspects. Furthermore, the Seventh National Malaysia Plan and the KL Structure Plan were being reconsidered.

Under these circumstances, the Government of Malaysia requested co-operation in formulating a Master Plan for the alleviation of traffic congestion and development of an integrated transportation system in Kuala Lumpur and its conurbation. In response to this request, the Government of Japan decided to conduct A Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (hereinafter referred to as the Study) through JICA in 1995.

2 Study Objective

The objectives of the Study are;

- to formulate urban transportation policies and strategies to alleviate traffic congestion and to improve the quality of the urban environment, by promoting the usage of public transport; and
- to formulate an Urban Transportation Master Plan in Kuala Lumpur Metropolitan area for the period up to the year 2020.

3 Study Area and Target Year

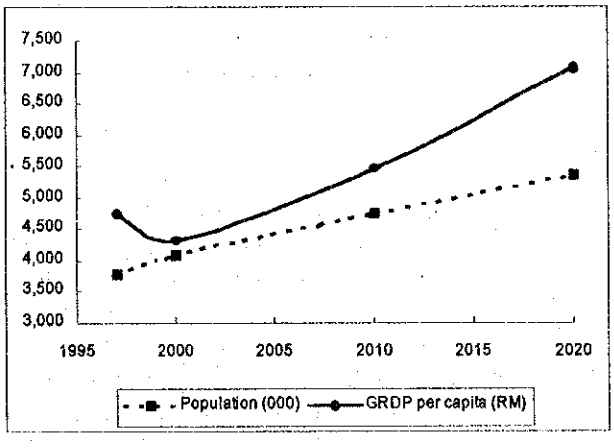
The Study area covers the Federal Territory of Kuala Lumpur and its conurbation about 10 km. from the boundary. As for the Home Interview Survey, the whole Klang Valley region has been set as the survey area.

The final target year for the Master Plan is the year 2020; however, the year 2010 has also been set as the intermediate-term target year.

4 Future Socio-economic Framework

The future socio-economic framework in the Klang Valley region were developed based on the size of the future populations, the job opportunities forecasted by the relevant government institutions, and the influence exercised by the Multi-media Super Corridor (MSC) project.

	Unit	1997	2000	2010	2020
GRDP	RM million	17,875	17,560	25,905	37,831
Population	Thousand	3,775	4,069	4,747	5,353
Employees	Thousand	1,593	1,752	2,134	2,518
Students	Thousand	873	977	1,190	1,315
GRDP per capita	RM	4,735	4,316	5,457	7,067



5 Urban Transportation Policies and Strategies

5.1 Objectives

Based on the current traffic situation and the perspective for future traffic situation, the following objectives for transportation policies have been established.

1) Efficiency

Efficient urban transport system should be developed to enforce urban functions and to sustain economic growth in the metropolitan area. Efficiency in transportation can be achieved by balancing transportation demand and transportation infrastructure capacity. It is of great significance to achieve efficiency by decreasing negative externality such as economic losses in travel time due to traffic congestion.

2) Equity

Minimum level of transportation services should be provided for all the members of the society to secure a civil minimum. There are two types of "Transportation Poor"; one is the economically poor who cannot afford to pay expensive transportation cost, and the other are the physically handicapped citizens who have difficulties with their mobility. An affordable and sufficient level of transportation system service should be provided for those people through the enhancement of public transport and normalisation of transportation system.

At the same time, homogeneous transportation services should be prepared among areas within the metropolitan area to achieve spatial equity between the areas.

3) Environmental Betterment

Air pollution and noise caused by automobiles should be minimised through the promotion of public transport and the control of traffic demand in congested areas. At the same time, reduction of exhaust gas and noise can be achieved by gradual advances in automobile technology guided by environmental standards.

5.2 Major Urban Transportation Policies

To achieve the three objectives of the urban transportation system development, the objectives are translated into the following four major urban transportation policies.

1) Alleviation of vehicular traffic congestion
- to increase road capacity through the development of road network.
- to make most use of the existing capacity through traffic control and the provision of transportation information.
- to decrease excessive traffic demand through transportation demand management.

2) Promotion of public transport usage
- to improve the level of public transport service.
- to decrease the cost of public transport.

3) Mitigation of atmospheric pollution and noises
- to decrease air pollutants and noise by enhancement of regulations.
- to decrease exhaust emission through advances in vehicle technology.

4) Normalisation of transportation system
- to prepare transportation facilities by taking amenity into consideration.
- to provide transportation facilities for the handicapped.

Attention should be paid to the following two items in order to establish transportation strategies.

- to cope with the traffic concentrating into the CPA (Central Planning Area); and
- to establish an urban transportation system which will effectively function in a harmony making use of the benefits of both vehicular traffic and public transport.

5.3 Policy Measures

Individual policy measures are described in the following.

1) Improvement of Road Facilities

The traffic demand in the year 2020 is predicted to be nearly twice as much as the present. One way to deal with the increase in traffic is to enhance the public transport, but there are some limitations in developing a public transort system. Thus road facility development is also required at a certain level to deal with the increasing demand. BOT projects using the private sector will focus on major trunk roads. In the meantime, in order to create urban areas of good quality, it is necessary to form a better road network by adding supporting arterial roads and other alternative roads as well.

2) Increase of Traffic Capacity Inside CPA

The following measures should be taken in order to increase the traffic capacity inside the CPA along with the traffic demand control policies:

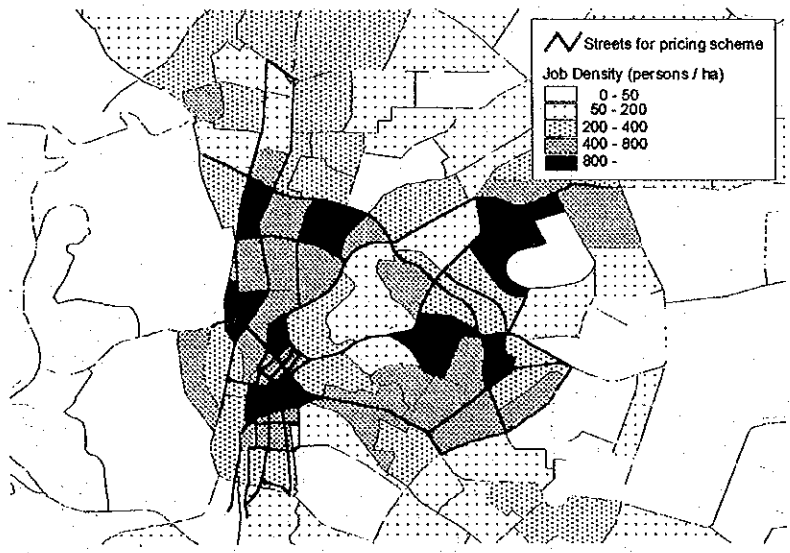
- introduction of a reversible flow lane system;
- improvement of the signal phase system from one-phase/one-way system to one-phase/two-ways system;
- introduction of a co-ordinated signal system at the intersections of major arterial roads; and
- conversion of the roundabouts into ordinary intersections by installing new traffic lights.

4) Utilisation of ITS

Intelligent Transport System (ITS) covers a broad range of fields. In the initial stage, it is crucial to establish transport information systems and traffic control systems. The system aims at alleviating the traffic congestion and increasing traffic safety by making use of the existing facilities efficiently through advances in information technology. In the short term, individual transport information will be established, and these systems should be integrated in intermediate term. When automated driving is realised in the long term, it will bring about an increase in transport capability and at the same time increase traffic safety.

3) Area Pricing

One of the main characteristics of the Kuala Lumpur metropolitan area is the concentration of the commuting traffic into the CPA. Staggered commuting hours have been adopted in the governmental offices in order to alleviate traffic congestion, but the effect has not been observed remarkably. For this problem, the Area Pricing scheme should be introduced to the commuting traffic after the proposed public transport improvement has been implemented, including the rail-based transport.



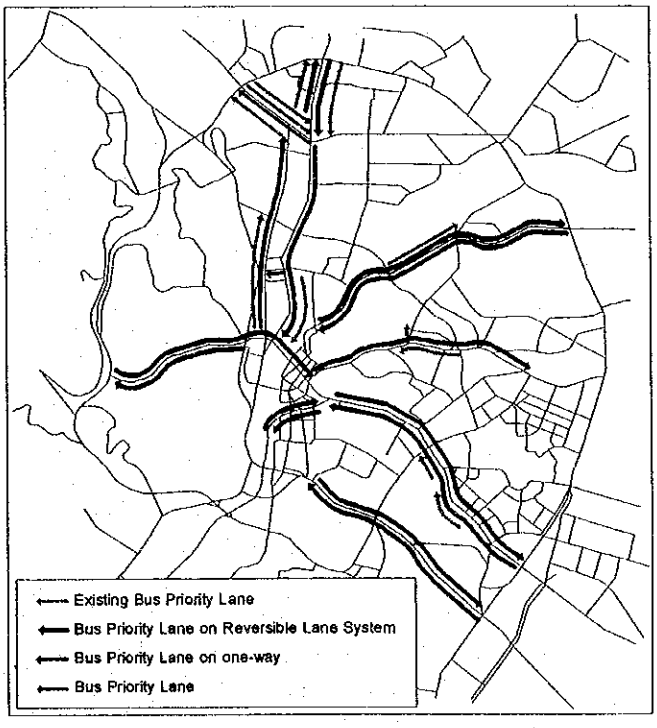
5) Regulation of Urban Development

Large-scale urban development projects which are currently in progress in the CPA will obviously create a large volume of vehicular traffic. It is necessary to regulate the urban developments to avoid creating excessive vehicular traffic, such ways as limitation of total floor areas, promotion of intensive development around railway stations, construction of residential buildings in the place of governmental offices in accordance with the MSC, and so on.

6) Improvement of Bus and Taxi Transport

As part of the integration of the public transportation, the following measures should be taken:

- provision of more priority to public transport
- re-organisation of bus routes
- enhancement of the level of service in bus operation (increase of frequency)
- provision of feeder bus services in order to support the rail-based transport; and
- utilisation of taxi services for short trips within the CPA and for feeder services to/from stations



Bus Priority Lanes in CPA

7) Improvement of Rail-based Transport

Without any measures taken, the traffic in the year 2020 is predicted to be nearly twice as much as the present. It is apparent that the future road facilities cannot accommodate this much traffic. To cope with this problem, it is necessary to make a shift away from the automobile-based transportation system, increase the modal share of public transport by improvement, and accomplish a balanced transportation system which is harmony with the vehicular traffic

8) Improvement of Pedestrian Facilities

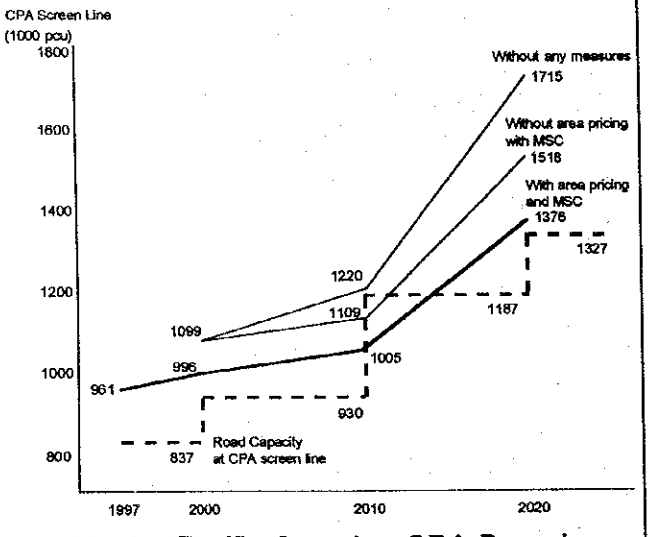
For pedestrians, it is important to create such an environment where the handicapped, infants, and the elderly can safely and smoothly walk. The improvement of pedestrian facilities will result in easy access to/from stations and bring about the promotion of rail-based transport systems.

9) Truck Terminal Development

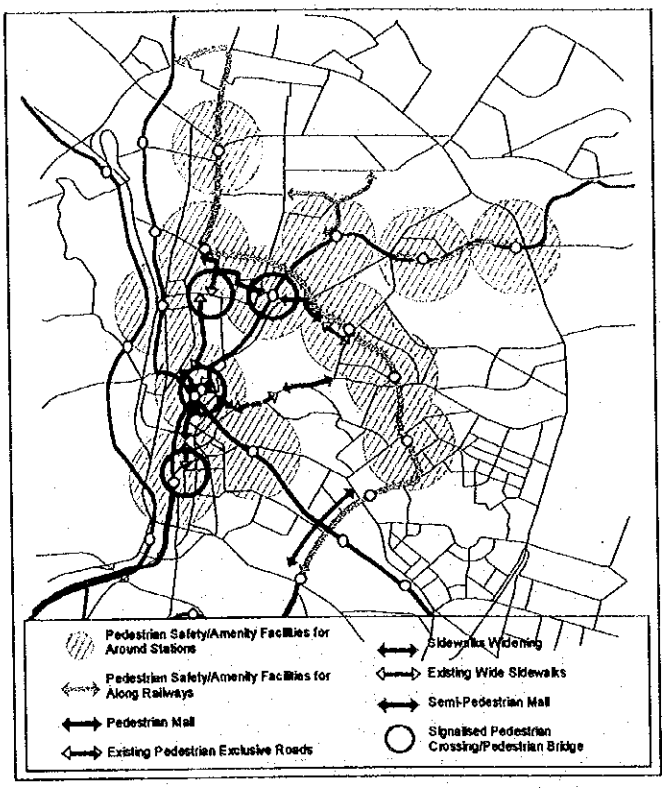
It is difficult for the present private companieis' phisical distribution facilities to handle the increase of freight movement in future. In order to transhipthe goods collectively and efficiently and to sustaine the quality of environment of suburban area, it is necessary to construct two public truck terminals outside CPA.

6 Future Transportation Demand and Urban Transportation Master Plan

In a short-term, the problem of traffic congestion in the CPA can be solved by traffic demand management such as Area Pricing and by increasing the traffic capacity through a reversible flow lane system and so on. In the medium and long terms, relocation of governmental institutions in accordance with the MSC, introduction of the trunk bus system, and provision of a new LRT line between Damansara and Cheras are expected to hold the total traffic demand under a tolerable service level of the transportation facilities.



Vehicular Traffic Crossing CPA Boundary



6.1 Short-term Plan in CPA

1) Area Pricing Scheme

Area Pricing scheme should be introduced on the congested streets within the CBD during the morning and evening peak hours. For a reduction of about 15% of the total automobile traffic in the year 2000, an amount of approximately RM 150 will need to be imposed on the users.

2) Packaged Plan in CPA

A package of traffic control/management plans should be adopted in order to cope with the various problems in the CPA as follows.

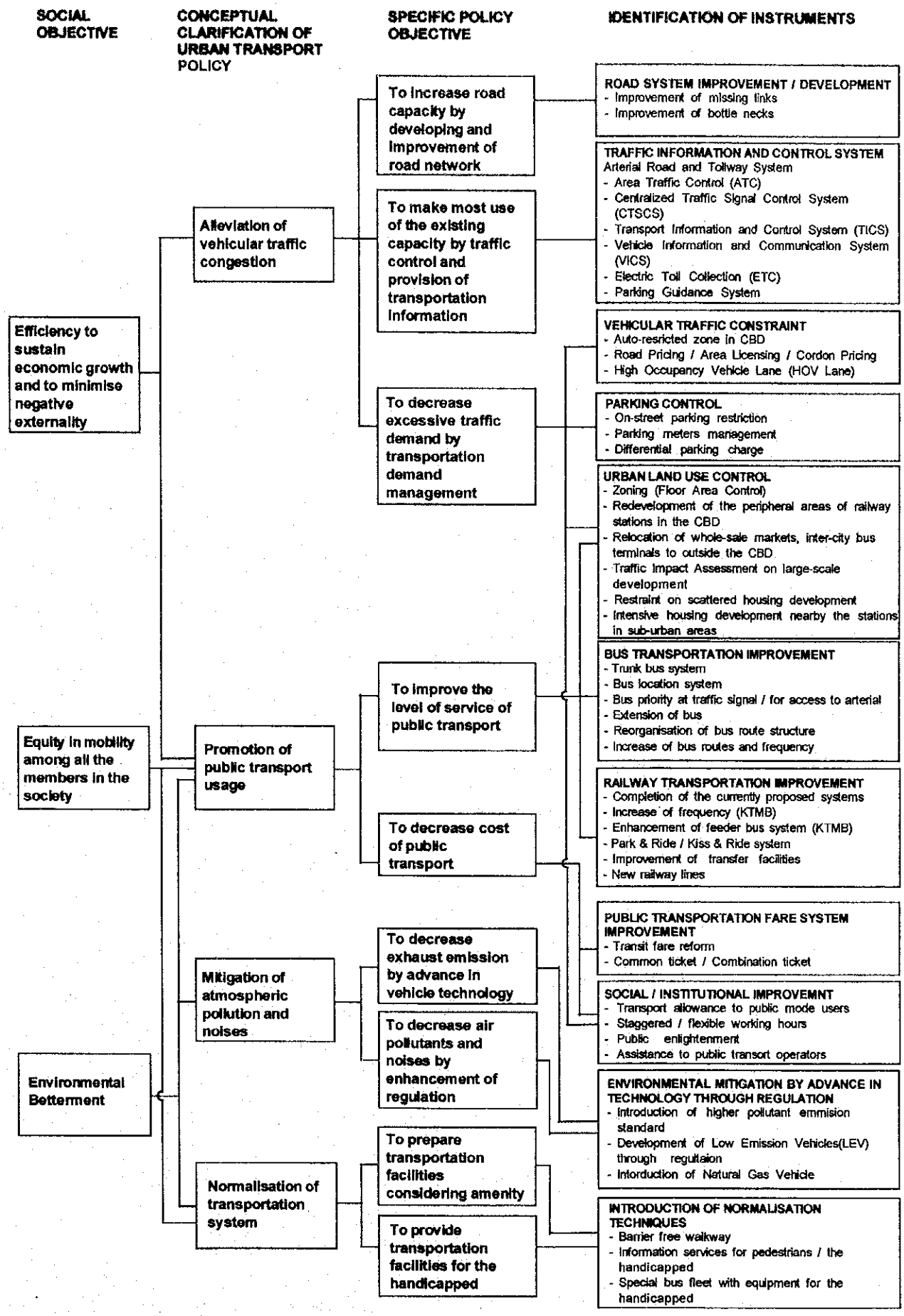
For traffic congestion at signalised intersections
- Traffic response system on over-saturated condition
- Co-ordination system of traffic signals
- Improvement of signal phasing system

For traffic congestion at no-signalised roundabouts
- Traffic signalised roundabout
- Improved channelisation system

For traffic spill-back associated with bottlenecks
- Reversible flow lane system

For traffic congestion of buses
- Bus priority lane system

For high rate of traffic accidents involving pedestrians and no pedestrian friendliness of crossing / sidewalk
- Signalised pedestrian crossing
- Pedestrian crossing bridge
- Scramble pedestrian crossing
- Pedestrian-friendly sidewalk



Objectives of Urban Transportation System Development and Policy Measures

6.2 Intermediate and Long-term Plans

In the intermediate and long terms, it is necessary to provide rail-based transport systems as in the existing plans, and to introduce a trunk bus system in other poorly-serviced areas. These plans will enable public transport to obtain a modal share of approximately 28 %.

(1) Public Transport Enhancement Project

- New Bus Operations: Commuter Express Bus and a CBD Circular Bus.
- Bus Transport Preferential Facility: Bus Priority Lane on the middle part of the roadway
- Trunk Bus System
- Relocation of Inter-City Bus Terminals
  a) North Inter-City Bus Terminal
  b) South Inter-City Bus Terminal
- Inter-modal Facility Development
- Transferring Among Rail-based System
- Park and Ride
- Pedestrian Facility for Public Transport

As part of the Long-Term Public Transport System Development Plan, the trunk bus lines: the Damasara - Cheras line via Jalan Raja Chulan will be converted into LRT lines. The other trunk bus lines coupled with rail-based transport should be maintained to serve the public transport passenger demand.

(2) Arterial Road Network

The currently proposed future road network by the private sectors appears to be well planned. However, the following new road projects should be added during the planning period.

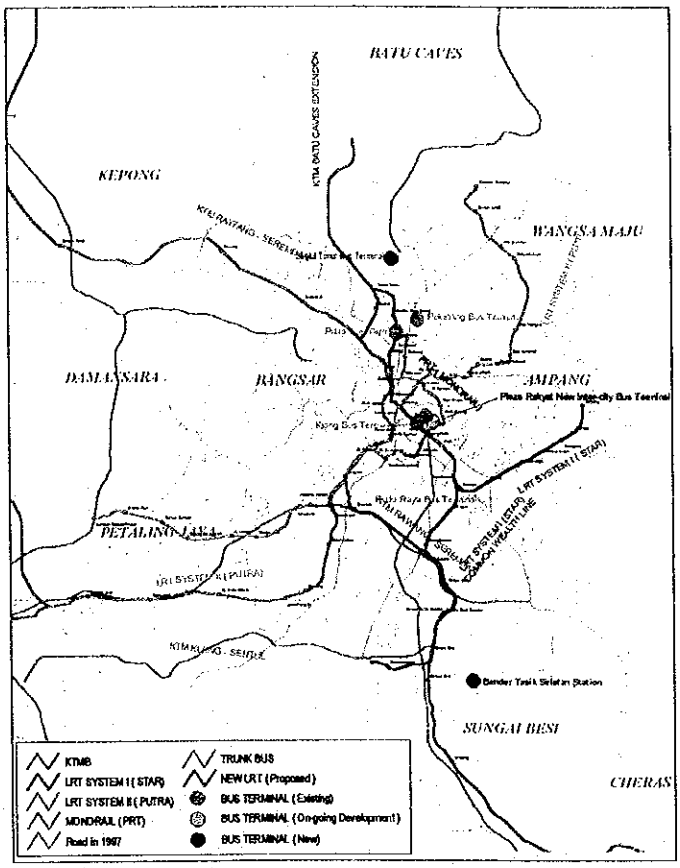
Under Ground Expressway

An underground expressway is proposed to solve the congestion problem in the City Center, which runs under Jln. Raja Chulan with several access ramps connecting to the existing streets and connect eventually with the Middle Ring Road (II).

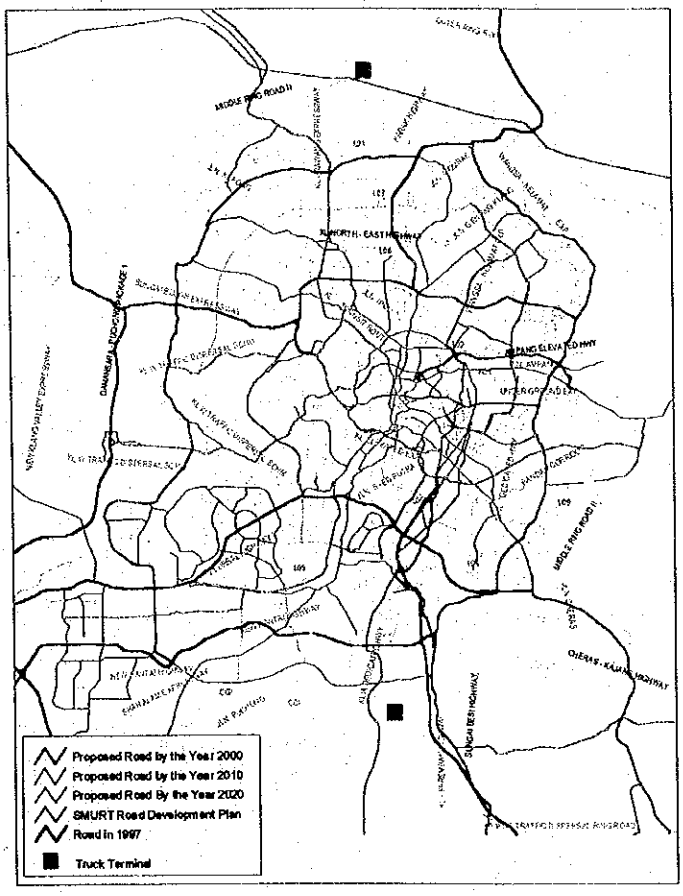
Newly Proposed Roads

NO		NAME	Length (km)	Cost (mil. RM)
(1)		Under Ground Expressway	6.6	2149.7
(2)	A01:	Arterial Road 1	2.2	597.7
(3)	A02:	Arterial Road 2	4.0	457.4
(4)	L01:	Local Road 1	16.5	224.6
(5)	L02:	Local Road 2	0.6	10
(6)	L03:	Local Road 3	0.2	8.2
(7)	L04:	Local Road 4	1.8	20.5
(8)	L05:	Local Road 5	2.6	26
(9)	L06:	Local Road 6	1.8	21.8
(10)	L07:	Local Road 7	1.7	28.9
(11)	L08:	Local Road 8	2.6	37.8
(12)	L09:	Local Road 9	1.0	15.6
(13)	C01:	Connection Link 1	3.2	25.9
(14)	C02:	Connection Link 2	3.9	14.3

Note: Length = excluding existing road section
Cost = Construction Cost + Land Acquisition Cost



Public Transport System Development Plan

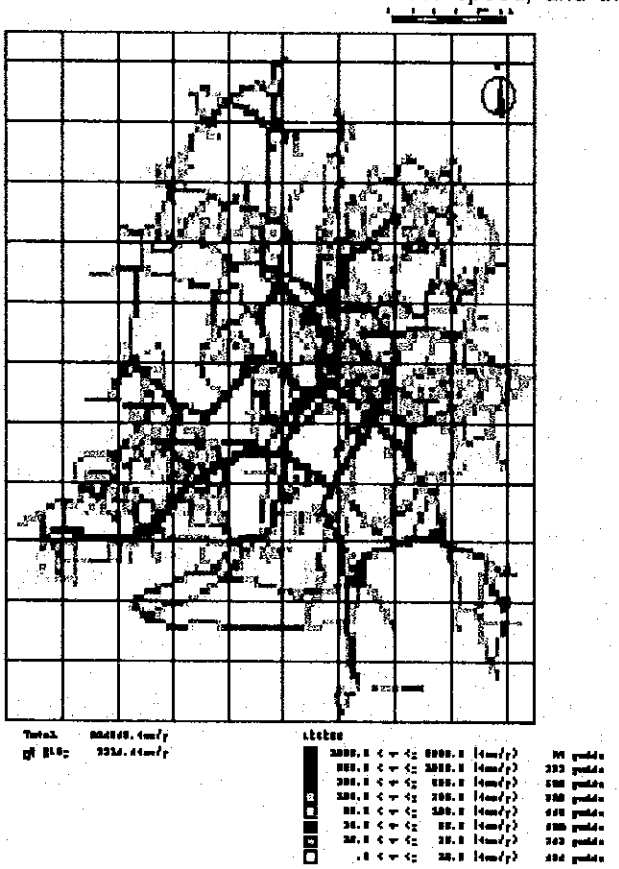


Arterial Road System Development Plan

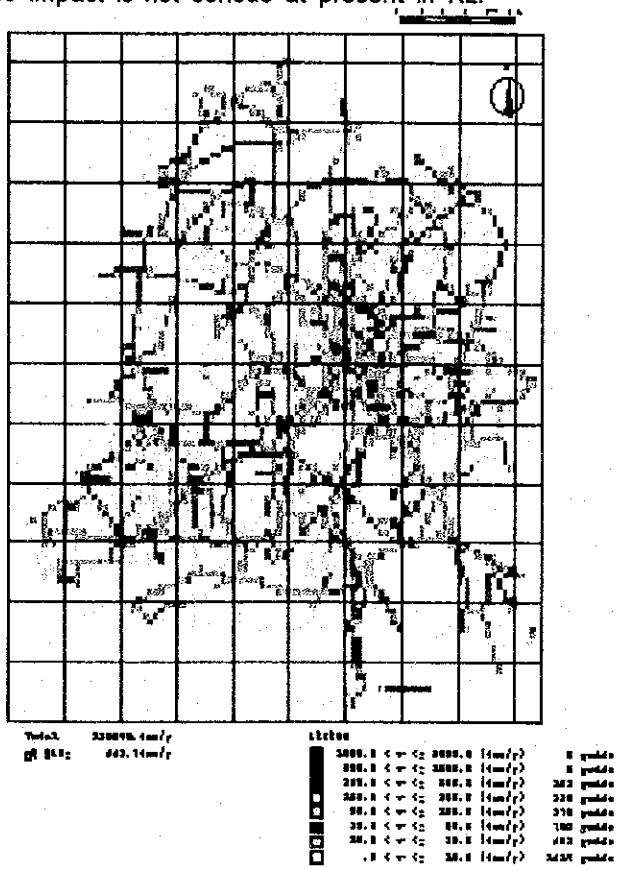
7 Environmental Consideration

Emissions of CO2 and NOx are the major environmental concern issues. From a long-term point of view, it is expected that there will be a significant progress in the improvement of vehicles such as LEV's and NGV's, which will contribute to a substantial reduction in total emission of CO2 and NOx. However, this is just an assumption and still an uncertain factor. Anyhow, without the effects caused by future improvement of the vehicle emission structure per se, the total emission volume of CO2 under the implementation of the short-term CPA package plan will be reduced by 13%. Implementation of the intermediate or long-term improvement plans will raise the modal share of the public transport and bring about an 18% of reduction of CO2.

As for NOx, the total emission of NOx will increase slightly in all short, medium, and long terms, because the average vehicle running speed will increase due to smoother traffic flow as a result of the improvement plans proposed in the Study. This increase of NOx cannot be avoided under the current vehicle emission feature related with the speed, and the impact is not serious at present in KL.



CO Current



CO Master Plan Case

8 Project Cost of the Master Plan

The total cost of the SMURT-KL Master Plan during the period from 1999 to 2020 is estimated to amount to approximately RM 20.4 billion (727 billion yen) in the September 1998 prices, which consists of RM 0.3 billion, RM 12.3 billion, and RM 7.8 billion for short, intermediate, and long terms, respectively.

9 Economic Analysis

The main cases for economic analysis are:

1) the base case in which the trunk bus system is solely introduced to the existing plans of transport facilities;

2) the case in which Area Pricing is additionally introduced to the base case; and

3) the case which includes the complete components including the New LRT Line between Damansara and Cheras which is converted from the trunk bus system.

As a result, the third case, the SMURT-KL Master Plan Case, showed the highest internal rate of return and has been defended in its project viability.

As for the provision of railway facilities, the tendency is that it is financially difficult to achieve. However, the economic analysis has proved that the case without railways will bring about a significant increase in the transport cost of the society.

Total Additional Investment Cost (in the market prices)

		Short-Term	Medium-Term	Long-Term	
		1999 – 2000	2001 - 2010	2011 – 2020	Total
1.	Arterial Transport Facility Development				
	1-1 New Rail Projects	0	0	4,768	4,768
	1-2 Trunk Bus System	217	286	0	504
	1-3 Highway Projects	8	11,758	2,994	14,760
	Subtotal	225	12,044	7,761	20,031
2.	Public Transport-Enhancing Projects	0	38	20	58
3.	Traffic Control / Management in CPA				
	3-1 Traffic Control/Management	51	0	0	51
	3-2 Area Pricing	5	0	0	5
	Subtotal	56	0	0	56
4.	Transport Information System & others	33	180	0	213
	Total	315	12,262	7,781	20,358

Note: 1) The costs without Project Scenario are excluded from the above figure. Namely the LRT projects and Expressway projects, which are expected to be completed by 2000, are not included in the costs.
2) Land and compensation costs are estimated based on LAPORAN RASARAN HARTA (Property Market Report), 1997.
3) Physical contingency is estimated at 20 % of the construction costs.
4) Land and compensation costs of new rail project: An additional cost is included, while the land converted from trunk bus route is included in the trunk bus costs.

Source: SMURT-KL

10 Financial Analysis on Rail-based Transport Systems

Railways provide better transport services than buses in terms of speed and reliability. It has been predicted that about 1.4 million (accounting for 12 percent of the total traffic) passengers would use the railways, on the assumption that expansion of the feeder services, provision of transfer facilities, and introduction of a common fare are realised. It is an ideal future direction that the KL metropolitan area should proceed toward in the sense of integrated urban transportation. In spite of the necessity to reinforce the function, railways are have been suffering from low ridership.

If railway services are not provided, then all users must use automobiles or buses. This excessive person trip demands would have to be carried by the road transport system and it would result in the deterioration of the urban environment including air quality. Therefore, railway systems are essential for desirable systematic urban transportation in the future. The viability of railway systems should be supported in various ways such as financial assistance from the public sector, transportation allowance, common ticket system, and so forth

11 Conclusion

In the course of implementing the recommended urban transportation Master Plan, it is of great importance to recognise that transport facility development alone cannot solve the problems. Application of traffic control is also important to make most use of the existing facilities. In addition, one should search not only for supply-side solutions, but transportation demand management should also be taken into account to secure the appropriate level of transport services. Finally it will be significant to improve the institutional aspects, such as the introduction of preferential taxation for the promotion of public transport and land use control. To realise the program, the setting up of a new organisation is also required.

Participants of the Study

The Government of Japan

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The Government of Malaysia

(1) Steering Committee

Chairperson

Mr. Ahmad Said bin Ahmad
(From March 1997 to 30th September 1998)
Secretary, Federal Territory Development and Klang Valley Planning Division, Prime Minister's Department.

Mr. Mohamad Ghazali bin Hj. Yahya
(From 1st October 1998 to end of Study)
Secretary, Federal Territory Development and Klang Valley Planning Division, Prime Minister's Department.

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1. Urban Transportation Department, City Hall of Kuala Lumpur

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4. Ministry of Entrepreneur Development

Mr. Zakaria Haji Jaafar

Mr. Khairul Dzaimee Daud

Mr. Ahmad Mahmood

Mr. Abd. Halim Mohamad

5. Ministry of Finance

Mr. Chen Chaw Min

Mrs. Hamidah Bidin

6. Ministry of Transport

Mr. Wahid Md. Don

Mrs. Rohaini bt. Mohd. Yusof

Mr. Othman Sulaiman

7. Public Works Department

Mr. Akashah Hj. Majisat

8. Federal Department of Town and Country Planning

Dr. Dahlia Rosly

Mr. Ahmad Naim Nawawi

Mr. Abbas Abdul Wahab

9. Department of Environment

Mr. Aminuddin Ishak

10. Statistic Department

Mr. Ng Man San

Mr. Koh Kim Hock

11. Selangor State Planning and Development Unit

Mrs. Azizah Yusof

12. Kuala Lumpur Road Transport Department

Mr. Sulaiman Harun

13. Kuala Lumpur Traffic PoliceDepartment

P/SUPT Mohd. Zain Hj. Ismail

Chief Insp. Raja Sekaran

14. Department of Master Plan, Kuala Lumpur City Hall

Mrs. Nik Mazni bt Nik Mohamad

15. Department of Public Work, Kuala Lumpur City Hall

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16. Petaling Jaya Municipal Council

Mrs. Noraini Hj. Mohd. Din

Mr. Mahmood Mohd. Khalid

17. Shah Alam Municipal Council

Mrs. Nurul Sheema bt. Abd. Rahman

18. Kajang Municipal Council

Mr. Reduan Idris

19. Ampang Jaya Municipal Council

Mrs Diana Abu Bakar

Miss Wan Syriati Wan Ibrahim

20. Subang Jaya Municipal Council

Mrs. Rasidah Shamsudin

Mrs. Asmidar Saarin

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A STUDY ON
INTEGRATED URBAN TRANSPORTATION STRATEGIES
FOR ENVIRONMENTAL IMPROVEMENT
IN KUALA LUMPUR

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Volume I

Chapter 1

General

Chapter 1 General

1.1 Introduction

In response to the request by the Government of Malaysia, the Government of Japan decided to conduct A Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (hereinafter referred to as the Study), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as JICA), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, undertook the study in close cooperation with the relevant authorities of Malaysia. The study started in March 1997 and ended in February 1999. This report compiles an integrated urban transport master plan with the target year of 2020, including urban transport policies and its strategy and facility development plan for the Kuala Lumpur metropolitan area. The Study is also called as "**S**trategies for **M**anaging **U**rban **T**ransport in **K**uala **L**umpur," and the abbreviation of the study is known as SMURT-KL.

1.2 Background

The background of the Study can be summarised as follows;

1) Although serious economic problems can be observed, the Malaysian economy has been rapidly expanding since 1987. The Second Outline Perspective Plan from 1991 to 2000 was formulated based on the National Development Policy (NDP)9 which outlines the beginning of a new era to make Malaysia a developed nation by the year 2020. The NDP was launched by Y. B. Dato Seri Dr. Mahathir Mohamad, Prime Minister of Malaysia, on January 17, 1991.

2) The expansion of the economy has encouraged rapid urbanisation and motorization. The highest growth of urbanisation and motorization is observed in Kuala Lumpur and the Klang Valley Region. The number of vehicles in Kuala Lumour has increased from 541,000 vehicles in 1991 to 861,000 in 1995 with an annual average growth rate of 10.8 %. The rapid growth of urbanisation has resulted in a deterioration of the environment in major urban areas, especially in Kuala Lumpur.

3) Traffic congestion in Kuala Lumpur and its conurbation is a crucial issue which has been given national priority. Several countermeasures have been proposed such as the introduction of new public transport modes, encouragement of car pooling, improvement of the bus system and stricter enforcement of traffic regulations.

4) In addition to the various efforts, further improvement of the public transport system may effectively alleviate urban environment problems. Presently, several types of public transport system are in operation or under construction. These include the KTMB commuter, LRT and buses.

5) Taking these situations into account, it is urgently important to formulate strategies for the development of an integrated transportation system to encourage greater use of public transport in Kuala Lumpur and its conurbation.

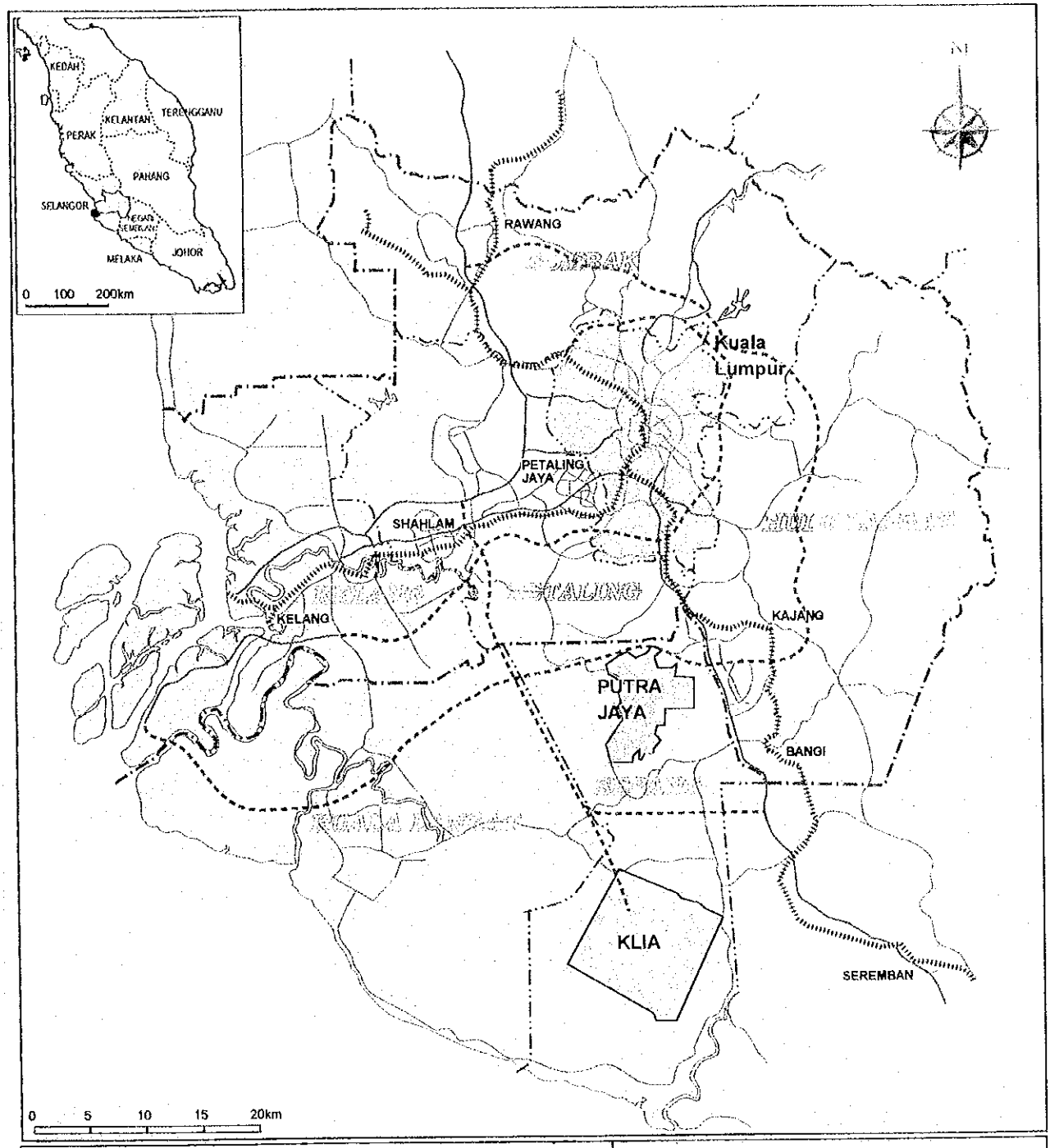
1.3 Study Objective

The objectives of the Study are;

- to formulate urban transportation policies and strategies to alleviate traffic congestion and to improve the quality of the urban environment, by promoting the usage of public transport, and
- to formulate an Urban Transportation Master Plan for the Kuala Lumpur metropolitan area for the period up to the year 2020.

1.4 Study Area

The Study area covers the Federal Territory of Kuala Lumpur and its conurbation within 10 km from the boundary. (see Figure 1.4.1)



Legend

- Klang Valley Boundary
- City of Kuala Lumpur
- Study Area
- Expressway / Highway
- Major Arterial Road
- Highway Plan / Under Construction

Figure 1.4.1 Study Area

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Chapter 2

Existing Socio-economic Conditions of the Klang Valley Region

Chapter 2 Existing Socio-economic Conditions of the Klang Valley Region

2.1 Population and GDP

Malaysia, consisting a population of 21.7 million in 1997 and approximately 330,000 square km of land, has been developing rapidly over the past twenty years. Population and GDP at 1978 price are shown in Table 2.1.1.

Table 2.1.1 Population and GDP since 1990

Population and GDP		1990	1991	1992	1993	1994	1995	1996	1997
Population	(000)	18,102	18,547	19,043	19,564	20,112	20,689	21,169	21,666
Growth rate in %			2.5	2.5	2.7	2.7	2.8	2.9	2.3	2.3
GDP at 1978 price in mil.		79,329	86,149	92,866	100,617	109,915	120,309	130,226	140,637
Growth rate in %			9.6	8.6	7.8	8.3	9.2	9.5	8.2	8.0
per capita at 1978 price		4,382	4,645	4,877	5,143	5,465	5,815	6,152	6,491
Growth rate in %	(RM)	-	6.0	5.0	5.5	6.3	6.4	5.8	5.5

Source: Department of Statistics, Economic Planning Unit

The annual population growth rate had been increasing by 2.5 % to 2.9 % until 1995, while the rate has decreased to 2.3 % in the last two years. The Gross Domestic Product (GDP) has been steadily growing at a very high annual growth rate of 8.0 to 9.6 % since 1990. Per capita GDP in terms of 1978 prices has also been increasing from RM4,382 in 1990 to RM6,491 in 1997. It means that the per capita GDP of Malaysia has increased by almost 50 % in real terms in the past seven years. Per capita GNP in current prices reached RM12,136 in 1997 which is equivalent to US$4,816.

As seen in Table 2.1.2, the population of the Klang Valley region has been growing from 2.0 million in 1980 to 3.8 million in 1997. It means that the population has grown by 1.86 times in the last 17 years. The annual average growth rate is calculated as being 3.7 %.

During the same period, the population of Malaysia grew from 13.2 million to 21.7 million. This is an increase of 1.57 times and the annual growth rate is 2.7% on average. As a result, the proportion of the population in the Klang Valley has increased from 15 % in 1980 to 17.5 % of the total in 1997.

The current zonal population density as of 1997 is illustrated in Figure 2.1.1. In KL, areas of high population density are seen everywhere except in the CBD and the western part of KL. Relatively high-density areas are also seen in the western major cities of the Klang Valley such as Petaling, Shah Alam, and Klang.

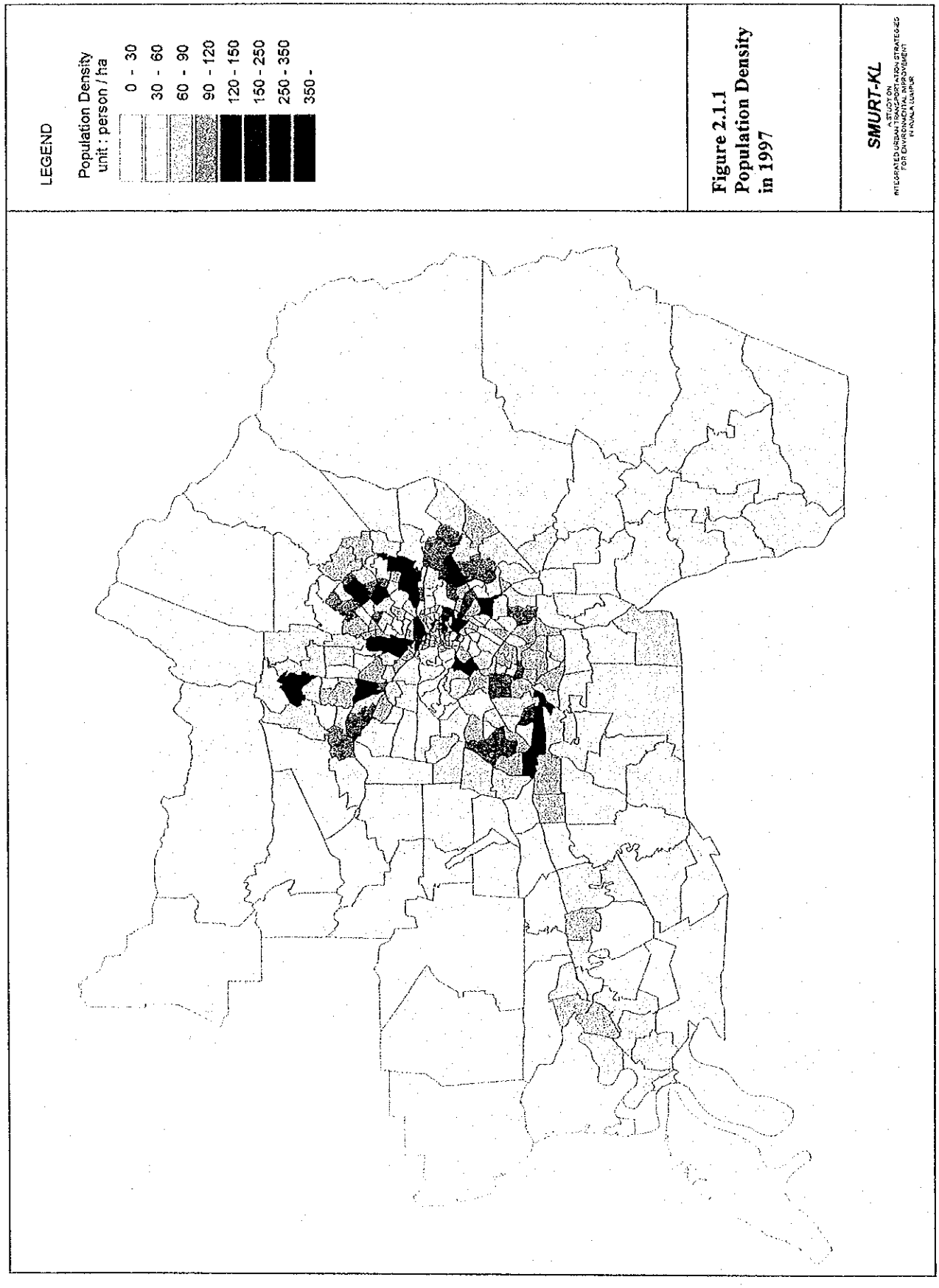
LEGEND
Population Density
unit : person / ha
0 - 30
30 - 60
60 - 90
90 - 120
120 - 150
150 - 250
250 - 350
350 -
Figure 2.1.1
Population Density
in 1997
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Table 2.1.2 Population Change in Klang Valley by District

(Unit : Thousand)

State	1980*	1991*	1992	1993	1994	1995	1996	1997
Malaysia	13,764.3	18,547.5	19,043.1	19,563.5	20,111.6	20,688.9	21,169.0	21,655.5
Selangor	1,048.9	1,913.2	2,017.8	2,094.0	2,174.0	2,257.9	2,327.9	2,399.2
Gombak	176.1	373.5	401.9	417.1	433.0	449.6	463.4	477.5
Klang	298.3	430.6	437.2	453.9	471.3	489.5	504.7	520.6
Petaling	385.5	670.6	699.9	726.4	754.3	783.6	808.3	833.1
Ulu Langat	189.0	438.5	478.8	496.6	515.4	535.2	551.5	568.0
Kuala Lumpur	978.3	1,262.1	1,281.1	1,301.0	1,321.7	1,343.5	1,358.9	1,374.7
Total	2,027.2	3,175.3	3,298.9	3,395.0	3,495.7	3,601.4	3,686.8	3,773.9

Source : Department of Statistics

Note 1: * denotes Census, while population in other years are estimates by the department

Note 2: Population of Selangor denotes Klang Valley area only.

Regarding the distribution of population within the Klang Valley region, it is clear that the share of the Federal Territory of KL has been continuously declining since 1980 as shown in Table 2.1.3. In 1980, KL's share was almost half of the total population of the region. However, the share has become almost a third in 1997, according to the estimate of the Department of Statistics.

On the other hand, the population of the Selangor State districts has increased remarkably. Among these districts, Ulu Langat has increased its population share rapidly from 9.3 % to 15.1 %, followed by Gombak from 8.7 % to 12.7 % during the period. The former has grown by 3.0 times, while the latter by 2.7 times in terms of district population, respectively. The Klang District has lost its share slightly from 14.7 % to 13.8 %, although its population increased by 1.7 times. The Petaling District showed a moderate growth among them by gaining slight increase in population share within the area. It should be mentioned that the district is second to the Federal Territory of KL in terms of the population scale.

Table 2.1.3 Population Distribution in Klang Valley by District

(Unit : %)

State	1980*	1991*	1992	1993	1994	1995	1996	1997
Selangor	51.7	60.3	61.2	61.7	62.2	62.7	63.1	63.6
Gombak	8.7	11.8	12.2	12.3	12.4	12.5	12.6	12.7
Klang	14.7	13.6	13.3	13.4	13.5	13.6	13.7	13.8
Petaling	19.0	21.1	21.2	21.4	21.6	21.8	21.9	22.1
Ulu Langat	9.3	13.8	14.5	14.6	14.7	14.9	15.0	15.1
Kuala Lumpur	48.3	39.7	38.8	38.3	37.8	37.3	36.9	36.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source : Department of Statistics

Note 1: * denotes Census, while population in other years are estimates by the department

Note 2: Population of Selangor denotes Klang Valley area only.

Table 2.1.4 shows the changes in household size in the Klang Valley region. The number of household members decreased by 0.2 from 5.4 in 1980 to 5.2 in 1997 in the Klang Valley region, while the household size for the whole Malaysia decreased by 0.3 from 5.5 to 5.2 during the same period.

Concerning decrease in the household size, Ulu Langat showed the largest change of 0.9 (from 5.9 to 5.0), followed by Klang (0.7) and Gombak (0.5). On the other hand, KL and Petaling remained as 5.2 and 5.1, respectively, which was the same as in 1980.

Table 2.1.4 Changes of Household Size in Klang Valley

	Population (000)			No. of Household			Average HH Members		
State/District	1980*	1991*	1997	1980*	1991*	1997**	1980*	1991*	1997**
Malaysia	13,764.5	18,379.7	21,665.5	2,516,295	3,566,859	4,204,518	5.5	5.2	5.2
Selangor	1048.9	1913.2	2399.2	187,715	370,174	464,536	5.6	5.2	5.2
Gombak	176.1	373.5	477.5	31,674	72,781	93,047	5.6	5.1	5.1
Klang	298.3	430.6	520.6	48,397	77,878	94,155	6.2	5.5	5.5
Petaling	385.5	670.6	833.1	75,402	132,230	164,272	5.1	5.1	5.1
Ulu Langat	189.0	438.5	568.0	32,242	87,285	113,062	5.9	5.0	5.0
Kuala Lumpur	978.3	1262.1	1374.7	188,288	244,267	266,060	5.2	5.2	5.2
Total Klang Valley	2027.2	3175.3	3773.9	376,003	614,441	730,596	5.4	5.2	5.2

Source: Department of Statistics

Note: * :Census Data

Note: ** : Estimated by the Study Team

2.2 Employment

Table 2.2.1 shows an international comparison of employment by industrial sector.

According to the table, the employment composition of Malaysia resembles that of industrialised countries rather than developing countries such as Indonesia, Philippines, and Thailand, because the manufacturing and construction sector has a great share in terms of employment. However, the agricultural sector is still dominant and the service sector holds a lower portion compared with the industrialised countries.

Table 2.2.1 International Comparison of Employment Composition by Industrial Sector

(Unit: %)

Selected Countries	Year	Agriculture	Mining & Quarrying	Manufacturing	Construction	Service & Others
Germany	1994	3.3	0.7	26.7	8.6	60.4
Japan	1994	5.3	0.1	23.2	10.2	60.3
United Kindom	1995	2.2	1.0	16.3	6.4	74.2
United States	1994	2.9	0.5	16.4	6.1	74.1
Hong Kong	1994	0.6	0.0	19.6	7.7	72.1
Singapore	1994	0.3	0.0	25.6	6.6	67.4
South Korea	1995	12.5	0.1	23.4	9.3	54.7
Taiwan	1994	10.9	0.2	27.8	10.8	50.3
Indonesia	1993	50.6	0.8	11.1	3.5	33.8
Malaysia	1996	16.8	0.5	27.0	8.6	47.0
Philippines	1994	44.7	0.4	10.3	4.7	39.9
Thailand	1994	41.6	0.2	15.2	7.7	36.9

Source: "The Malaysian Economy in Figures 1997", EPU

Tables 2.2.2 and 2.2.3 show employment by industrial sector in the Klang Valley region in 1980 and 1991. In 1980, the Klang Valley region had a share of 17.5 % of the total employment of the nation, while the share increased to more than 20 % in 1991.

In the Klang Valley region, the position of the Federal Territory of KL dropped to 39 % in 1991 from almost 50 % in 1980 in terms of the share of the total employment. This trend is quite similar to the population distribution mentioned before.

Employment growths are seen in the surrounding districts of KL, in particular, Ulu Langat and Gombak. The shares of employment increased from 9 % to 14 % and from 8 % to 11 % during the period, respectively.

Table 2.2.2 Employment by Industrial Sector in Malaysia and Klang Valley in 1980

Unit: 000

Industrial Sector	Malaysia	Klang Valley	Kuala Lumpur	Total* Selangor	Gombak	Klang	Petaling	Ulu Langat
Agriculture, forestry, hunting and fishing	1,697.3	56.0	15.2	40.8	5.1	13.6	10.8	11.3
Mining and quarrying	43.6	5.3	1.6	3.7	0.8	0.0	2.2	0.7
Manufacturing	584.7	170.0	72.3	97.7	12.8	27.6	45.4	11.9
Electricity, gas and water	8.7	1.7	0.7	1.0	0.2	0.5	0.3	0.0
Construction	205.1	51.7	27.2	24.5	3.5	5.2	9.7	6.1
Wholesale and retail trade, restaurants and hotels	532.3	136.5	81.1	55.4	8.3	13.9	24.5	8.7
Transport, storage and communication	157.1	43.8	22.3	21.5	3.5	7.6	7.2	3.2
Financing, insurance, real estate and business services	78.5	39.4	21.8	17.6	3.2	2.3	9.8	2.3
Community, social and personal services	955.6	235.9	124.4	111.5	22.9	26.1	43.0	19.5
Industry not adequately described/ not stated	100.4	23.1	12.6	10.5	2.1	2.8	3.5	2.1
Total	4,363.3	763.4	379.2	384.2	62.4	99.6	156.4	65.8

Source: Population Census in 1980, Department of Statistics
Note: * Total of Gombak, Klang, Petaling and Ulu Langat Districts

Table 2.2.3 Employment by Industrial Sector in Malaysia and Klang Valley in 1991

Unit: 000

Industrial Sector	Malaysia	Klang Valley	Kuala Lumpur	Total* Selangor	Gombak	Klang	Petaling	Ulu Langat
Agriculture, forestry, hunting and fishing	1,463.4	16.1	1.2	14.9	2.3	5.5	2.6	4.5
Mining and quarrying	30.0	5.6	2.1	3.5	1.1	0.0	1.2	1.2
Manufacturing	1,151.5	283.0	73.0	210.0	26.0	59.6	86.4	38.0
Electricity, gas and water	42.0	6.8	2.6	4.2	0.6	1.2	1.5	0.9
Construction	383.8	83.6	30.7	52.9	11.8	9.2	15.2	16.7
Wholesale and retail trade, restaurants and hotels	839.7	197.7	88.9	108.8	23.7	20.5	37.1	27.5
Transport, storage and communication	251.9	67.0	24.2	42.8	7.8	13.9	13.3	7.8
Financing, insurance, real estate and business services	215.9	111.0	49.5	61.5	15.5	6.5	24.2	15.3
Community, social and personal services	1,337.5	309.4	129.0	180.4	40.9	29.5	66.1	43.9
Industry not adequately described/ not stated	275.9	134.2	72.8	61.4	9.0	11.2	29.4	11.8
Total	5,997.6	1,214.4	474.0	740.4	138.7	157.1	277.0	167.6

Source: Population Census in 1991, Department of Statistics
Note: * Total of Gombak, Klang, Petaling and Ulu Langat Districts

Table 2.2.4 shows the composition of employment by industrial sector for Malaysia, the Klang Valley, Selangor, and KL.

It is conspicuous that in the Klang Valley area the manufacturing and financing-related sectors held a large share, while the agricultural sector had a small share compared to the data for the whole nation.

Among the regions in the Klang Valley, KL had a remarkably bigger share held by the wholesale/retail and financing sectors against other districts. On the contrary, Gombak and Petaling Districts the manufacturing sector held a greater share of employment.

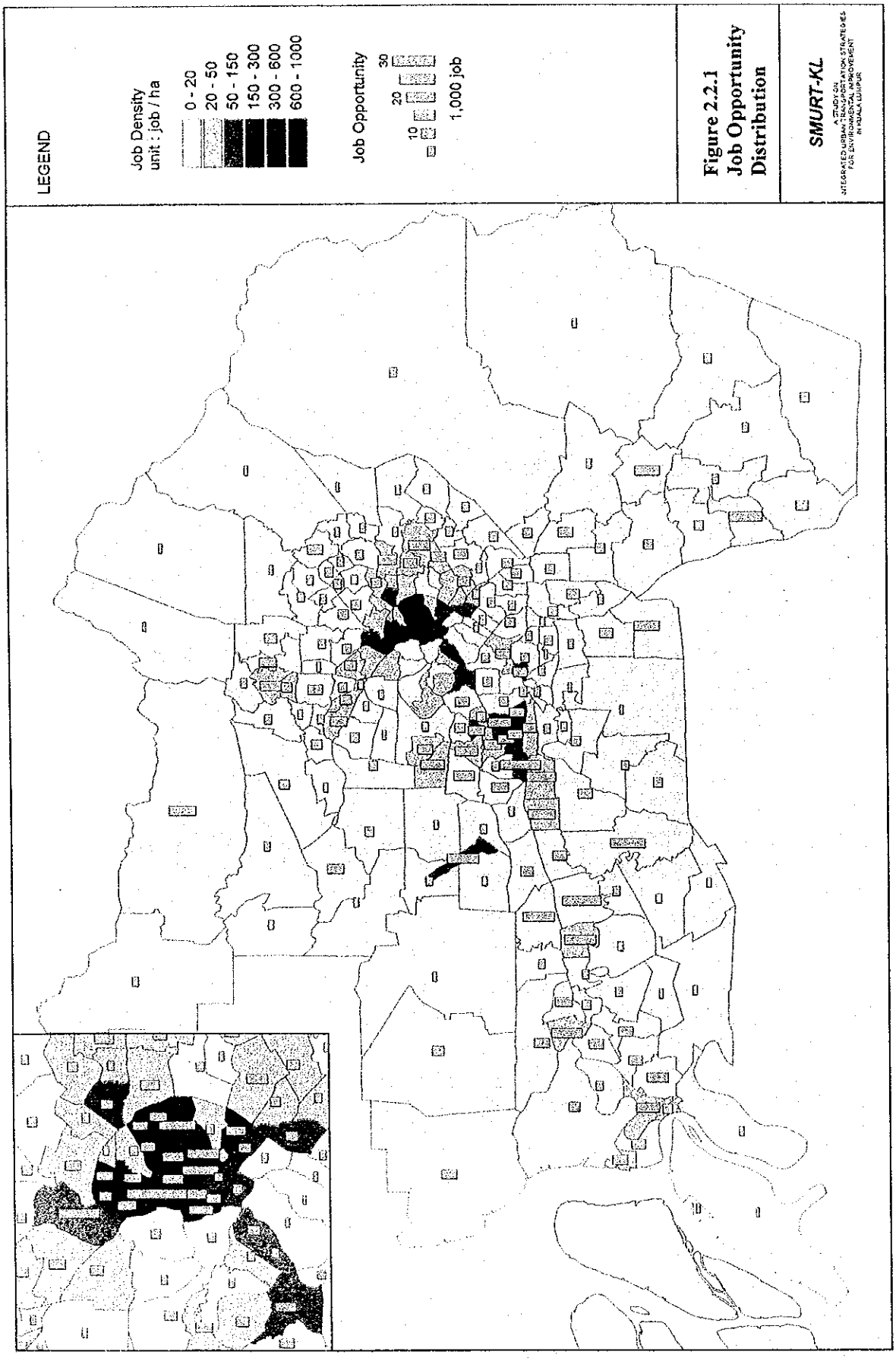
Table 2.2.4 Composition of Employment by Industrial Sector in 1991

Unit: 000

Industrial Sector	Malaysia	Klang Valley	Kuala Lumpur	Total* Selangor	Gombak	Klang	Petaling	Ulu Langat
Agriculture, forestry, hunting and fishing	24.4	1.3	0.3	2.0	1.7	3.5	0.9	2.7
Mining and quarrying	0.5	0.5	0.4	0.5	0.8	0.0	0.4	0.7
Manufacturing	19.2	23.3	15.4	28.4	18.7	37.9	31.2	22.7
Electricity, gas and water	0.7	0.6	0.5	0.6	0.4	0.8	0.5	0.5
Construction	6.4	6.9	6.5	7.1	8.5	5.9	5.5	10.0
Wholesale and retail trade, restaurants and hotels	14.0	16.3	18.8	14.7	17.1	13.0	13.4	16.4
Transport, storage and communication	4.2	5.5	5.1	5.8	5.6	8.8	4.8	4.7
Financing, insurance, real estate and business services	3.6	9.1	10.4	8.3	11.2	4.1	8.7	9.1
Community, social and personal services	22.3	25.5	27.2	24.4	29.5	18.8	23.9	26.2
Industry not adequately described/ not stated	4.6	11.1	15.4	8.3	6.5	7.1	10.6	7.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Population Census in 1991, Department of Statistics
Note: * Total of Gombak, Klang, Petaling and Ulu Langat Districts

Job figures as of 1997 were estimated via the HIS data together with the control totals of the district figures. The current zonal job density and opportunity are presented in Figure 2.2.1. It is clear that an enormous number of jobs are concentrated in the CBD of KL and its surroundings. Other areas with relatively high job density are Petaling Jaya, Subang Airport, and so forth.


LEGEND
Job Density
unit : job / ha
0 - 20
20 - 50
50 - 150
150 - 300
300 - 600
600 - 1000
Job Opportunity
30
20
10
1,000 job
Figure 2.2.1
Job Opportunity
Distribution
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2.3 Average Household Income

Average household income varies from zone to zone in the region as illustrated in Figure 2.3.1. In the western part of Kuala Lumpur such as Damansara and Bangsar, and the northern part of Petaling Jaya, the average household income is significantly high, accounting for 60 percent to 70 percent, compared to other parts of the region. Relatively high household income was also noted in the eastern and northern parts of Kuala Lumpur.

LEGEND
unit : RM/month
- 500
501 - 1,000
1,001 - 1,500
1,501 - 2,000
2,001 - 3,000
3,001 - 4,000
4,001 - 5,000
5,001 - 10,000
10,001 - 15,000
15,001-
Figure 2.3.1
Zonal Average
Household Income
SMURT-KL
A STUDY ON
INTEGRATED URBAN TRANSPORTATION STRATEGIES
FOR ENVIRONMENTAL IMPROVEMENT
IN KUALA LUMPUR