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Public Transportation in Kuala Lumpur, Malaysia

Introduction – Project Description

The following report will provide an in depth look at the public transportation system in Kuala Lumpur. The current public transportation system in Kuala Lumpur consists of bus, light rail, monorail, airport express rail link, and commuter rail. This report will focus on these modes and provide both a general overview of the system and detailed information on each of these modes. In addition, it will explore the current status of the KL public transportation system as compared to those of other cities and the likely impact and environmental consequences of maintaining the status quo.

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PART I – Overview, general issues, and problems

Sources:

- LexisNexis
- 8th Malaysia Plan
- Malaysia - Transport Projects in 2001, ACEC
[www.acec.org/projects 2001.htm](http://www.acec.org/projects%202001.htm)
- Malaysia Govt Urged to Rethink Transport Policy
www.oneworld.net/ips2/sept01/10_16_030.html
- <http://www.malaysia.or.kr/infrastructure.htm>
- <http://www.kiat.net/malaysia/KL/transit.html>

Overriding Issue: Lack of Integration and focus

Public transportation in Kuala Lumpur consists of buses, LRT (Light Rail Transit), monorail, airport express rail link, and commuter rail. The most serious issue concerning the public transportation system in Kuala Lumpur is a lack of focus and coordination at all levels throughout the system.

At the national level the government does not actively promote public transportation and there is a lack of government focus on the issue. In the 8th Malaysia Plan, which is the government roadmap for development in Malaysia over the next several years, there is much emphasis on improving the quality of life in urban areas and a concern for environmental issues but there are few direct references to public transportation. In addition, no single ministry or department oversees or is in charge of public transportation. Several agencies oversee various parts of the system, but there is no coordination between them, and the state and local governments have no formal authority in this area.

The various transportation responsibilities and the agencies that oversee them are as follows:

Public Transportation Function	Ministry/Department
Transport policy	EPU (Economic Planning Unit) of the prime minister's Department and the Transport Ministry
Road regulations enforcement	Road Transport Department
KTM(national rail system), and LRT(Light Rail Transit)	Railways Department under the Transport Ministry
Road network and infrastructure	Works Ministry
Taxi and bus licensing	Entrepreneur Development Minister
Number of buses and routes	Commercial Vehicles Licensing Board

See the exhibit 1 for the transportation ministry organization chart – about half of the above departments are part of the Transport Ministry. The org chart is from the Transport Ministry website: <<http://www.mot.gov.my/english/General/Orgchart1.htm>>

As a consequence of the lack of coordination at the government level there is a lack of integration at the system level between the various modes and within each mode. Infrastructure projects such as the LRT systems and the monorail were built without serious consideration of their role in the larger system. There are multiple bus companies but they do not serve as efficient feeder services to the light rail systems, nor do they coordinate with each other. Often there are multiple bus companies serving a single area and thus competing with each other, while other areas may have no service at all.

The lack of integration leads to a low level of service. Route maps and schedules for buses are not readily available and routes are subject to change. Transferring between buses run by different companies represents an even greater difficulty since there is no coordinated service between separate companies. Due to the fixed nature of the infrastructure, the LRT systems have set routes and schedules, however transfers to buses are generally necessary to complete a trip for most riders. Both LRT systems provide their own limited feeder bus service with set schedules and routes; however, due to their limited nature these services are often not sufficient and must be supplemented by the other bus services. In addition separate, incompatible, fare and ticketing systems for the various modes and services compound the problem.

Ridership is low in general, representing approximately 20% of total person trips in Kuala Lumpur, as compared with cities in neighboring countries where it ranges from at least 40% to over 70%. One likely cause of the low ridership is the lack of integration and thus low accessibility and service reliability. Car and motorcycle ownership in KL is high because gasoline is relatively inexpensive and taxes, tolls, and parking costs are low. Most people would rather drive than take public transportation even if there were a high level of service, thus a low level of service makes it much more difficult to attract riders.

Until recently the public transportation system in KL consisted of numerous, separate, private companies. However, many of these companies have faced serious financial difficulties for several years due to a combination of the low ridership and competition between providers. The combined debt of the various public transportation providers is over RM10 billion, the two LRT systems account for approximately RM5.5 billion.

Recently, due to these debts the government has been consolidating the company assets of several of these companies (including those of both LRT systems and at least one of the primary bus companies) under one company SPNB (Syarikat Prasarana Negara Berhad), which is a subsidiary of the Ministry of Finance. However, this company has been created for the express purpose of managing the assets and the infrastructure, and has not been charged with overseeing operations or the coordination of the system. There is talk of a coordination effort of some sort, but currently none exists, and it is unclear whether one will be implemented anytime in the near future.

PART II – Detailed description by mode

Bus System

The two primary bus companies are Cityliner and Intrakota. Other bus companies include Len Seng Bus and Metrobus and both PUTRA and STAR LRT systems provide limited feeder bus service from their stations.

It has been difficult to find ridership information and only limited route and schedule information is available.

Cityliner

<http://www.parkmayberhad.com/>

Renong to sell shares in Park May” <http://rootv54.host.sk/article.php?sid=45>

Company information and current status

Cityliner bus service is run by Park May Berhad, which is partially owned by Renong Bhd (the company which previously owned PUTRA). Renong wants to sell their interest in the company.

Characteristics and Technology

A travelcard can be used on all cityliner buses, in addition to the “Touch ‘n Go” smart card, which can be used on the PUTRA LRT system as well. All buses are equipped with a computerized fare and ticketing system, but these are not compatible with ticketing systems on buses operated by other companies or with STAR LRT.

Pricing is based on the zonal fare system, which has been endorsed by the Government through the Commercial Vehicle Licensing Board (see exhibit 4).

Intrakota

Transweb Malaysia – “DRB-HICOM a step closer to selling of Intrakota”

Company information and current status

Intrakota is a subsidiary of DRB-HICOM, however the company is attempting to sell Intrakota to the government due to Intrakota’s losses totaling RM400mn over the past few years.

Characteristics and Technology

Only limited schedule information is available on Intrakota. The smart card is not yet compatible with Intrakota’s fare and ticketing system.

Other bus companies:

Len Seng Bus – No information is available on this company

Metrobus – The company was established in 1992. It primarily serves the following areas: Subgang Jaya, Gombak, Cheras, and Kampung Pandan.

LRT feeder bus service

PUTRA LRT feeder bus service - provides dedicated feeder bus service within 3-km radius from each station. Bus schedules are posted at major bus stops. The operational hours coincide with the LRT operation hours. Bus service frequency is every 15 to 30 minutes depending on traffic.

STAR LRT feeder bus service- some stations provide feeder bus service from the station to nearby neighborhoods. The stations providing this service are Sentul, Chan Sow Lin, Maluri, Pandan Jaya, Cempaka, Ampang, Cheras, Salak Selatan, Bukit Jalil and Sri Petaling.

RAIL SYSTEMS:

LRT, KL Monorail, Airport Express Rail Link, KTM Komuter

LRT systems

General information on the LRT systems

The LRT systems in the KL area consist of two systems:

STAR (Sistem Transit Aliran Ringan) and,

PUTRA (Projek Usahasama Transit Ringan Automatik)

- Route and fare maps are displayed at all stations.
- handicapped accessible
- traveling across the city takes about 30 minutes, and about 10 minutes within the city's commercial center
- Ridership levels for STAR and PUTRA combined are approximately 290,000 commuters per day (<http://www.putralrt.com.my/index.asp>). (See exhibit 2 for ridership charts for PUTRA, STAR, and KTM)

Technology:

- electrically-powered trains operating on double tracks
- a ticket is required to access the platform and also to leave the station. The fare collection system uses plastic tickets with magnetically stored information and stations have ticket vending machines
- Smart cards can be used on PUTRA (both on the LRT and buses).
- PUTRA is a fully automated, driverless system.

STAR

<http://www.kiat.net/malaysia/KL/transit.html>

<http://www.kuala-lumpur.ws/transportation/starlrt.htm>

http://www.stesensentral.com/integ_rail/star/

Initial Cost

The STAR LRT network was built within the budgeted cost of RM3.5 billion (US\$920mn) and opened ahead of schedule.

Public/Private Nature

Initially: Build, Own and Operate concession.

In 1990, Taylor Woodrow and Adtranz formed a Consortium. The cost of construction was privately financed through a Build, Own and Operate concession. Malaysian companies represent 55% of the investors, with the remainder made up of international companies including a 30% share held by the Consortium.

Currently: Government owned

SPNB (Syarikat Prasarana Negara Berhad), a subsidiary of the Ministry of Finance, took over the assets of both the STAR and PUTRA systems as of September 1, 2002. This was part of a government effort to integrate the public transportation system in Kuala Lumpur, and also due to the severe losses incurred by both LRT systems. The

government plans to lease the operations of the system to the companies, but maintain ownership of the infrastructure.

System Characteristics

STAR is a driver-operated system. It is partially elevated and partially at-grade. Construction started in 1993 and opened to the public in 1998. The system consists of 27 km and 25 stations, and it links Sentul Timur, Ampang and Sri Petaling through the city center. (see STAR map and transit map in exhibit 3).

Some stations provide feeder bus service. STAR operates from 6 a.m. to midnight on Monday through Saturday and from 8 a.m. to 11 p.m. on Sunday. Service frequency ranges from every four to six minutes during peak hours (between 7.30am to 9.00am on Mondays to Saturdays and between 4.30pm and 7.30pm on Mondays to Fridays). At all other times, train frequencies are every six to ten minutes.

PUTRA

<http://www.putralrt.com.my/>

<http://www.kiat.net/malaysia/KL/transit.html>

Initial Cost

The PUTRA LRT network was built at a cost of RM150 million per kilometer (US\$39.5mn), for a total cost of RM4.4 billion (US\$1.15 billion).

Public/Private Nature

Initially: Build, Own and Operate concession.

PUTRA was incorporated on October 24, 1994 to design, construct, operate and maintain this LRT System for Kuala Lumpur and was a subsidiary of Renong, a Malaysian-owned company.

Currently: Government owned, see STAR for more information.

System Characteristics

PUTRA is a fully automated line. It is mostly elevated but contains 5 underground stations. The system consists of 29km (18 mi) and 24 stations. The system opened to the public in 1999 (it opened partially at the end of 1998, but the full system was not operational until the middle of 1999).

PUTRA provides feeder bus service within 3-km radius from each station. PUTRA LRT and buses operate from 6 a.m. to midnight on Monday through Saturday, and from 8 a.m. to 11 p.m. on Sunday. Service Frequency ranges from three to six minutes depending on the time of day for most of the week, but goes up to ten minutes after 9:30 p.m. on Monday through Thursday and after 7:30 p.m. on Sunday. Bus service frequency is every 15-30 minutes depending on traffic. (See exhibit 3 for PUTRA map)

KL Monorail

<http://www.kiat.net/malaysia/KL/transit.html>

<http://www.monorail.com.my/default.htm>

The reader should be aware that the KL Monorail is often referred to in the literature as an LRT system or as “one of three LRT systems”, this refers to STAR, PUTRA, and the Monorail. For the purpose of this report the monorail is considered a separate category.

Initial Cost

RM 1.18 billion (US\$310.5mn)

Public/Private Nature

Build, Own and Operate

A concession agreement was signed on October 29, 1996 between The Government of Malaysia and KL Monorail System Sdn Bhd to undertake the development, construction, management, operation and maintenance of the system. In return, KL Monorail will be allowed to retain all income collected from the provision of railway services and facilities for a period of 40 years.

System Characteristics and Technology

The monorail was developed and built in Malaysia. It was built to serve the central business, hotel and shopping district of Kuala Lumpur and it runs from Jalan Tun Razak Bus Terminal to KL Sentral. The KL Monorail has the following characteristics: dual guideway, straddle-beam, fully elevated, with 11 stations, 5 power sub-stations, 1 depot and 12 monorail trains. It is 8.6km in length. It was scheduled to open in 2002, but was delayed due to technical problems. It is now scheduled to begin operations in March 2003.

Express Rail Link (ERL) - KL city centre to Sepang airport in 28 minutes

<http://www.kiat.net/malaysia/KL/klsentral-erl.html>

<http://www.kliaekspres.com/main.htm>

<http://www.railway-technology.com/projects/klia/>

Initial Cost

RM2.4billion (US\$625mn)

Public/Private Nature

Build, Operate, Transfer

The Concession Agreement between Express Rail Link Sdn Bhd (ERLSB) and the Ministry of Transport was signed on August 25, 1997. The concession includes design, finance, construct, manage, operate and maintain a high-speed air-rail system between Kuala Lumpur City Air Terminal (KL CAT) at the Kuala Lumpur Sentral Station and KLIA (Kuala Lumpur International Airport) for a period of 30 years.

System Characteristics and Technology

KLIA Ekspres (express rail link) is a system linking the city to KLIA. The main terminals are at Kuala Lumpur Sentral Station (Brickfields) and Kuala Lumpur

International Airport (Sepang). It began commercial operations on April 17, 2002. It has a maximum speed of 160kph (100mph), which is the fastest speed for public transportation in the country. The system is 57 km (35.4 miles) in length, double-tracked, bi-directional for both direct and commuter services. The hours of operation are from 5am to 1am. Departures are every 15 minutes and the travel time is 28 minutes for direct service. A one-way fare is RM35 (which is less than half the price of a taxi). The seating capacity is 156 passengers per four-car train set. Ridership was, on average, over 4,000 passengers per day as of September 6, 2002.

KTM Komuter

<http://www.ktmb.com.my>

Public/Private Nature

KTM Berhad is owned by the government, but operates as a private sector organization: it is responsible for its own revenue and operations.

System Characteristics and Technology

In 1995, KTM Berhad introduced KTM Komuter, which is a commuter rail system serving the Klang Valley, and is Malaysia's first electrified rail system. The primary goal of KTM Komuter is to provide service to people in the Klang valley, with the ultimate aim of reducing congestion in the city. The hours of operation for KTM Komuter are from 5:30am to midnight on Monday to Saturday and from 6am to midnight on Sunday and Public Holidays. Service frequency is every 15 minutes during the peak and every 20 or 30 minutes in the off-peak (depending on the line). Fares depend on the origin and destination of the trip.

Kuala Lumpur Sentral (KL Sentral)

<http://www.kiat.net/malaysia/KL/klsentral-erl.html>

<http://www.klsentral.com.my/welcome.htm>

<http://www.stesensentral.com/>

KL Sentral is a development to be built at the center of KL that will include a retail center, office buildings, hotels, residential space, and the 400,000 sq ft Sentral Station. The project will be completed in two phases; the first phase, which includes Sentral Station is expected to be completed by 2004. Sentral Station will be a transportation hub for commuter, intercity and airport express rail networks and the PUTRA-LRT and KL Monorail.

PART III– Sustainability, and future outlook

Sources:

- To traffic hell and back, LexisNexis, June 16, 2000
- Alternative Policy Study: Reducing Air Pollution in Asia and the Pacific, UNEP GEO-2000 report.
- Singapore: Breathing Easy, Down to Earth, Vol 9, No 7, August 31, 2000
- Review of Transport in the ESCAP Region 1996-2001, pages 37-46

There is a trend of rapid motorization in many Asian cities, and thus congestion is increasingly becoming a problem. In many of these cities the average travel time for work trips is 42 minutes and in Bangkok it is as high 60 minutes. Vehicular emissions have become a major source of air pollution: the levels of pollution in many Asian cities far exceed the World Health Organization guidelines.

Kuala Lumpur currently has traffic congestion problems with projections showing that congestion is going to get worse if nothing is done. There are as many as 2 million vehicles on the streets of KL every day. Bangkok's traffic is considered among the worst in the region and KL is heading in that direction. Air and noise pollution are increasingly becoming a problem. Congestion impairs productivity, which results in economic costs in addition to pollution problems, which affect public health.

There are 184 cars per 1000 people in Kuala Lumpur as apposed to 45 for Hong Kong, 106 in Singapore, and 153 in Bangkok. In Kuala Lumpur the modal share of public transport is about 20% of total person trips. In contrast, in Hong Kong, Singapore, and Tokyo the modal share is 70% or more, and in Bangkok, Jakarta, and Manila the modal share of public transport is between 40 and 60% of total person trips. Kuala Lumpur has a higher per capita than Bangkok, Jakarta, and Manila, but a lower modal share of public transport.

Integrating the public transportation system and using an integrated ticketing system across public transport modes and providing better traveler information has had a significant impact on public transport modal share in cities such as Singapore and Hong Kong. In addition Singapore has implemented significant restrictions on private vehicle use. Before instituting these measures Singapore was one of the most polluted Asian cities but its pollution levels are now below World Health Organization standards and have remained so for over 10 years.

A study on transportation and the environment in Kuala Lumpur, completed in 1997 by the Japan International Cooperation Agency (JICA) indicated that public transport is necessary to reduce congestion, otherwise with no measures taken traffic in 2020 is expected to be nearly twice as much as current levels.

Kuala Lumpur is currently facing congestion and air pollution problems; if the status quo is maintained it will result in increasing congestion and increasing and likely dangerous levels of air pollution. During the last decade the LRT systems, the monorail, the ERL and the KTM Komuter services were built. This represents an increased investment and interest in public transportation, but the system is still under-invested and fragmented. Kuala Lumpur needs to increase the level of investment in public transportation and must take significant measures to integrate and improve the existing system. It may then need to take measures similar to Singapore to reduce the number of private vehicles on the roads, especially in the most congested areas, but these measures cannot be taken until an efficient public transportation system is in place.

PART IV - Data needs and Areas of future research

Now that a good understanding of the public transportation system in Kuala Lumpur has been established, and the key issues have been identified there are several areas to consider in the future:

Areas of future research

1. Designing an integration plan:

One of the most significant issues for the KL public transportation system is the lack of integration. Thus far, the government under the Ministry of Finance has created SPNB to consolidate the assets of several of the companies with serious financial problems. However, this company is not responsible for operations or planning.

Designing a comprehensive integration plan for the various public transportation modes, which takes into account the possible barriers to implementation is one possible area of future research. Some possible barriers to the implementation of an integration plan might be government resistance, considering the fragmented nature of the numerous ministries and departments connected to public transportation. In addition, convincing the remaining private operators such as KL Monorail to participate in an integration effort may pose a problem.

2. The use of public/private partnerships and private ownership in public transportation in KL:

Public/private partnerships in the form of build, own, operate concessions and private ownership have played a significant role in the public transportation system in Kuala Lumpur. Recently the severe financial difficulties of various private providers, has resulted in the creation of the government owned SPNB to consolidate the assets of these companies. One possible area of future research would be to analyze public/private partnerships and private ownership of public transportation in Kuala Lumpur. Some points to consider include the following:

- What went wrong in KL and could the current situation have been prevented?
- Can public/private partnerships be used effectively in KL and if so in which circumstances and under what conditions? What is the best mix?
- To what extent should the government be involved in the public transportation system in KL

3. Ridership levels

In contrast to cities in neighboring countries, public transportation in Kuala Lumpur suffers from low ridership. Further exploration into the reasons for this and designing a plan to increase the modal share is a possible area of future research. It may be helpful to conduct a review of the strategies employed by other Asian cities that have successfully improved their modal share for public transportation and to consider the similarities and differences between KL and these cities in terms of whether these methods could be beneficial in KL.

Data Needs

There is a lack of information and data in several areas. The following list summarizes the data and information that will likely be needed in future research.

1. Bus route maps and schedules where they exist are needed for analyzing the current state of the system in terms of mobility and accessibility.
2. Other than a general characterization of the system as having low ridership almost no information is available on the ridership level of the various public transportation systems. Ridership statistics for the various bus systems are needed to better analyze current demand.
3. Based on various general statements the level of investment in public transportation in KL can be classified as insufficient. Exact or at least approximate figures on the level of investment in both capital and operations on the part of both the public and private sector are needed for an analysis of the situation.
4. The Commercial Vehicle Licensing Board determines the number of buses and routes: a better understanding of how these decisions are made is needed.
5. The following reports are studies that have been conducted on the public transportation system in KL and the Klang Valley during the last decade and will likely provide useful information. Thus far these reports have not been accessible:

Ecoville Consultancy Group. (1989) *Minibus Transportation Study in the Kuala Lumpur Conurbation* (Ecoville Consultancy Group, Institute of Advanced Studies, c Kuala Lumpur: Ministry of Public Enterprises, Commercial Vehicles Licensing Board.

JICA. (1987) *Klang Valley Transportation Study, Final Report, Main Volume*. Kuala Lumpur: Government of Malaysia.

JICA (1998) *Study of Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (SMURT-KL)*. Kuala Lumpur: Japan International Cooperation Agency and Dewan Bandaraya Kuala Lumpur.

References

- 8th Malaysia Plan < http://www.epu.jpm.my/Bi/dev_plan/EighthMP/frontrm8.html>
- CSE (Center for Science and Environment). “Singapore: Breathing Easy.” August 31, 2000. *Down to Earth*, Vol 9, No 7. Dec 3, 2002. <http://www.cseindia.org/html/dte/dte20000831/dte_analy.htm>
- “DRB-HICOM a step closer to selling of Intrakota.” Online Posting. Sept. 2002, Transweb Malaysia. Nov. 2002 <<http://rootv54.host.sk/article.php?sid=144>>
- Grewal, Hardeep. “Transportation in Malaysia.” Online Posting. July 13 2001. GVConnects Reports. January 23, 2003. <<http://www.gvconnects.com/articles/viewarticle.cfm?catid=6&newsid=54>>
- Infrastructure, Transportation. Malaysian Embassy in Seoul. Nov. 11, 2002. <<http://www.malaysia.or.kr/infrastructure.htm>>
- Integrated Rail Services (Kuala Lumpur). Dec 30, 2002. <http://www.stesentral.com/integ_rail/star/>
- Keretapi Tanah Melayu Berhad (KTMB). Jan 6, 2003. <<http://www.ktmb.com.my>>
- “Kuala Lumpur Airport Express High Speed Rail Link, Malaysia.” Railway Technology. Jan 6, 2003. <<http://www.railway-technology.com/projects/klia/>>
- KLIA Ekspres. 2002 Express Rail Link Sdn. Bhd. Jan 21, 2003. <<http://www.kliaekspres.com/main.htm>>
- KL Monorail. MTrans Holdings Sdn Bhd. Jan 6, 2003 <<http://www.monorail.com.my/klms/intro.htm>>
- Kuala Lumpur Sentral. Kiat.net. Jan 6, 2003. <<http://www.kiat.net/malaysia/KL/klsentral-erl.html>>
- KL Sental. Kuala Lumpur Sentral 2001. Jan 21, 2003. <<http://www.ksentral.com.my/welcome.htm>>
- Malaysia - Kuala Lumpur - Mass Transit. Kiat.net. Oct. 24, 2002. <<http://www.kiat.net/malaysia/KL/transit.html>>
- “Malaysia - Transport Projects in 2001.” Thursday Communique, ACEC. Nov 11, 2002. <www.acec.org/projects_2001.htm>
- Metrobus. Transweb Malaysia. Nov 25, 2002. <<http://www.transweb.com.my/metrobus/Default.htm>>

- Netto, Anil. "Malaysia: Govt Urged to Rethink Transport Policy." Sept. 13, 2001. Oneworld.net. Nov. 11, 2002. <www.oneworld.net/ips2/sept01/10_16_030.html>
- Oh, Errol. "To Traffic Hell and Back." June 16, 2000. New Straits Times Press (Malaysia) Berhad Malaysian Business. *Lexis-Nexis*.
- Parkmayberhad.com. Nov. 20, 2002. <<http://www.parkmayberhad.com/>>
- PUTRA LRT. Syarikat Prasarana Negara Berhad (SPNB). Nov 20, 2002. <<http://www.putralrt.com.my/index.asp>>
- "Renong to sell shares in Park May." Online Posting. February 2002. Transweb Malaysia. November 2002. <http://rootv54.host.sk/article.php?sid=45>
- Sistem Transit Aliran Ringan Sdn. Bhd (STAR). Transportation, Kuala Lumpur Website. Asia Web Direct (M) Sdn Bhd. Nov. 20, 2002. <http://www.kuala-lumpur.ws/transportation/starlrt.htm>
- Yunus, Kamarul. "Snag in Klang Valley Transport Integration." Geocities.com. Jan 6, 2003. <<http://www.geocities.com/intrakota2020/snagin.htm>>
- UNEP. "Alternative Policy Study: Reducing Air Pollution in Asia and the Pacific." April 25, 2002. GEO (Global Environmental Outlook)- 2000. Nov. 2002. <<http://www.unep.org/geo2000/aps-asiapacific>>
- UNESCAP. "Part Two: Land Transport: Urban Transport, Railways, Roads and Road Transport." 2001. *Review of Developments in Transport and Communications in the ESCAP Region, 1996-2001 -- Asia and the Pacific*, pages 37-46. <http://www.unescap.org/tctd/pubs/files/review2001_part2.pdf>

Exhibit 1

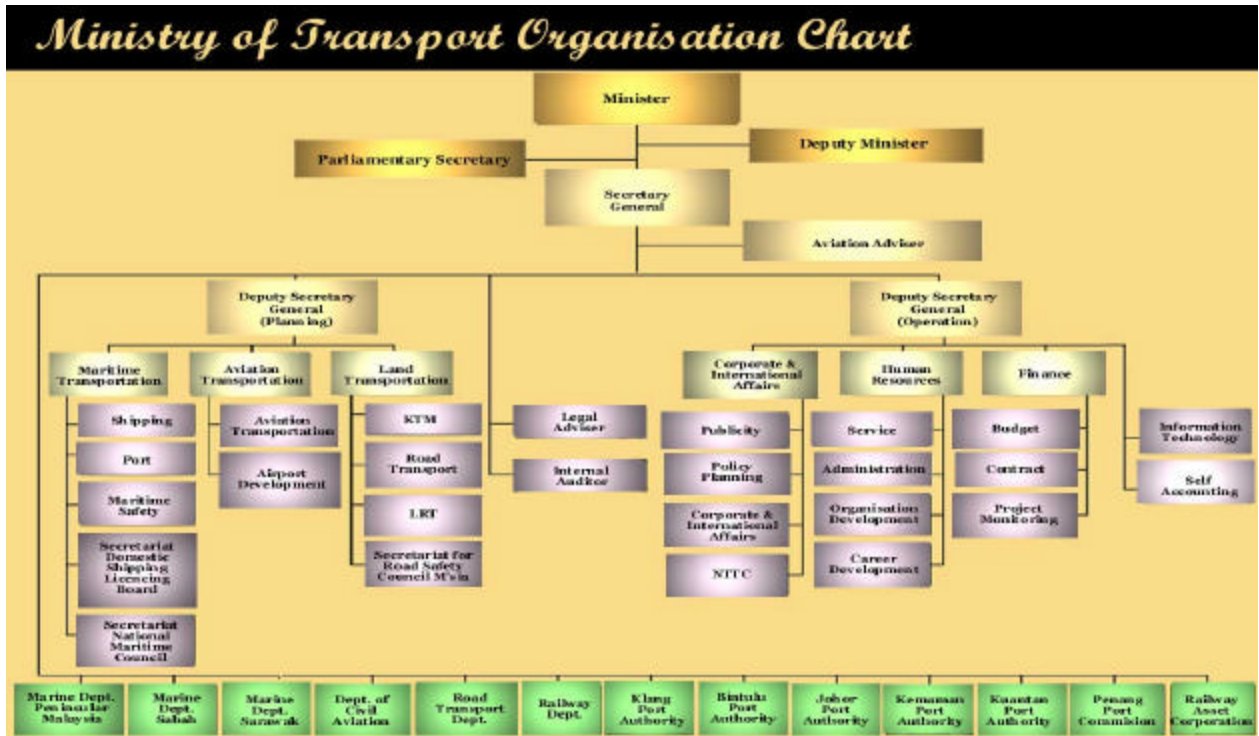


Exhibit 2

Ministry of Transport LRT and KTM ridership statistics

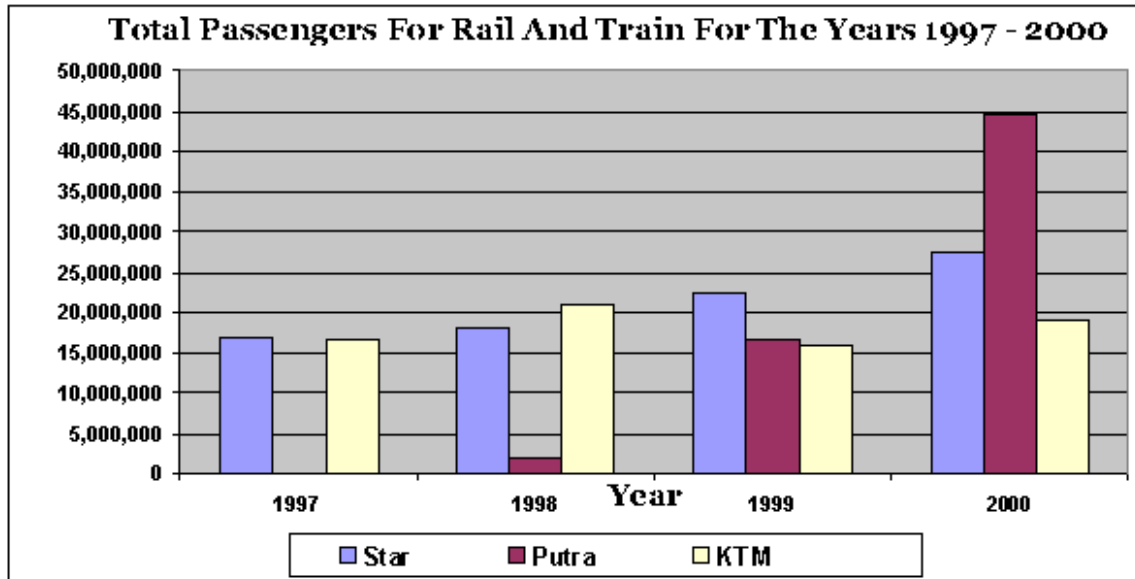


Exhibit 3 – Part 1

MASS TRANSIT

(STAR, PUTRA, MONORAIL, ERL, KTM Komuter)



<http://www.kiat.net/malaysia/KL/transit.html>

Exhibit 3 – Part 2

PUTRA LRT Route Map

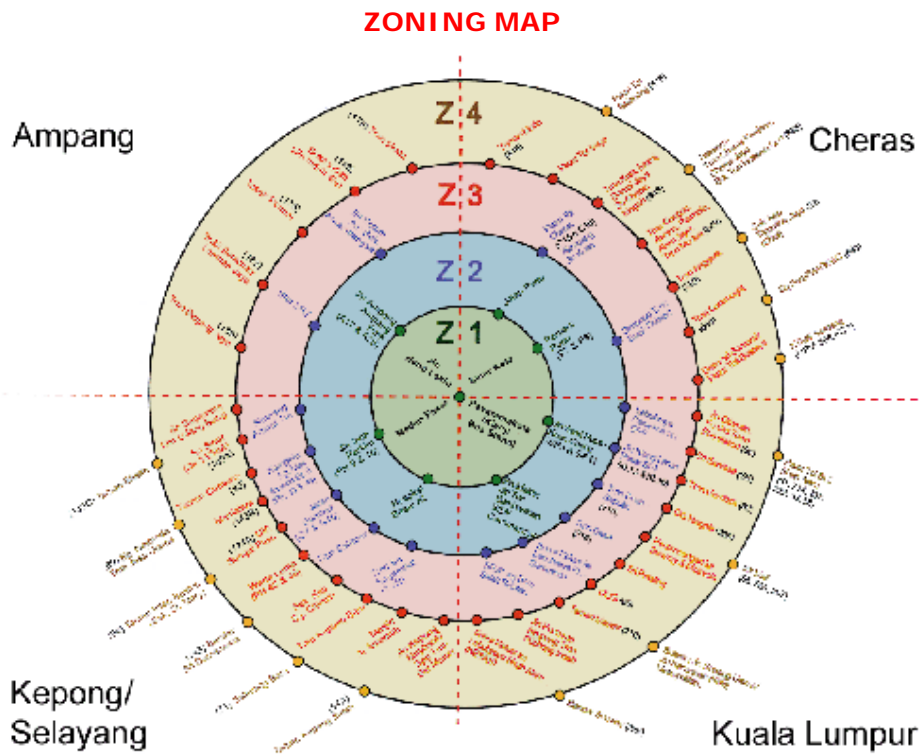




Exhibit 4

Cityliner Zones:

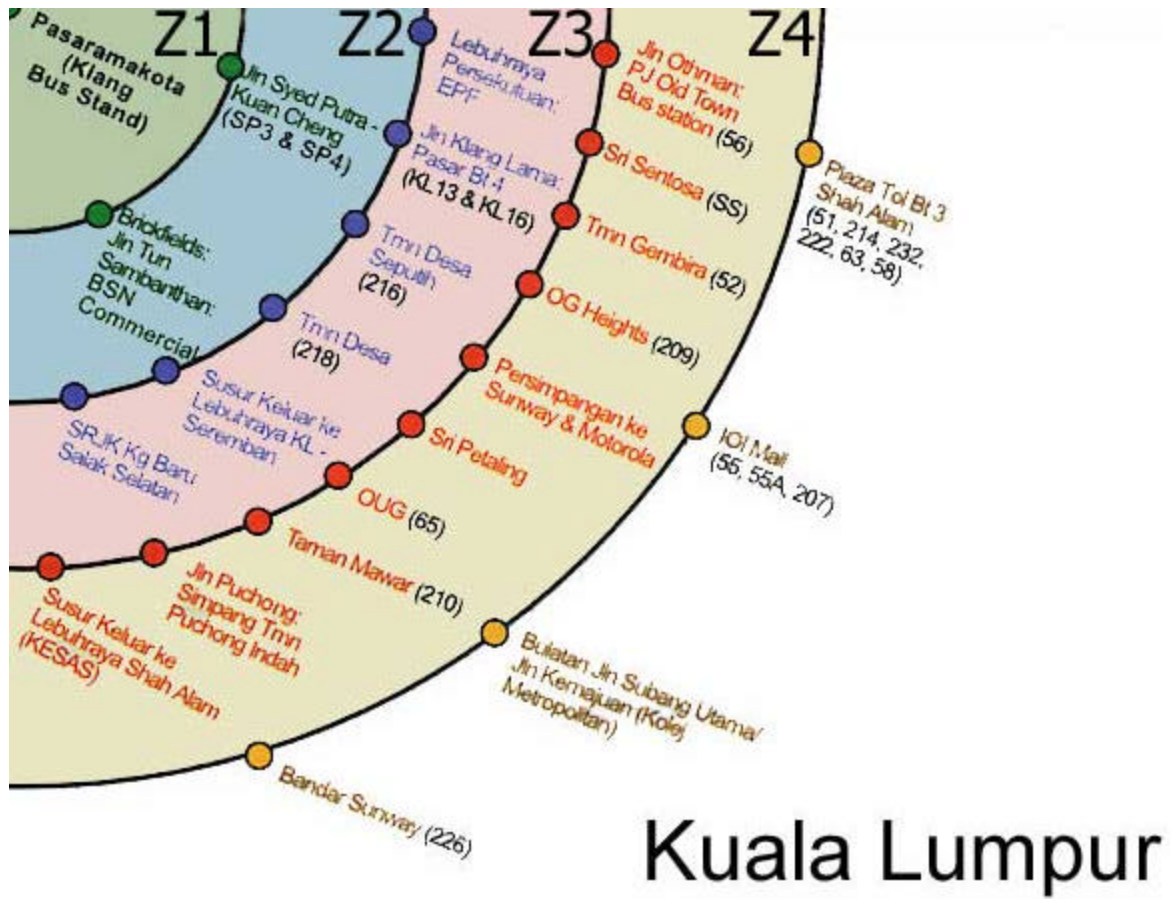
Pricing is based on the zonal fare system, which has been endorsed by the Government through the Commercial Vehicle Licensing Board as below :



Click on the above sections (Ampang, Cheras, Kepong/Selayang, Kuala Lumpur) to zoom in.

	Zone 1	Zone 2	Zone 3	Zone 4
Zone 1	0.70	1.20	1.60	2.00
Zone 2	1.20	0.70	1.20	1.60
Zone 3	1.60	1.20	0.70	1.20
Zone 4	2.00	1.60	1.20	0.70

CITYLINER : KLANG VALLEY ZONAL FARE SYSTEM



Kuala Lumpur