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# Factors In Train Delay Keretapi Tanah Melayu Berhad A Perspective On Logistic Management

# HANIM BINTI BAHARI

Final project paper submitted to National Defence University of Malaysia in fulfilment of the requirements for the Master of Business Administration (Supply Chain and Logistics)

#### Abstract

Time delays usually occurred due to poor coach supply and weak train sets consistency (breakdown problems).Commuters find it very difficult to schedule accordingly leading to delays to their everyday journeys. The first problem that KTM Komuter users have faced is long waiting period. The average waiting time of 150 minutes recorded, based on the survey carried out in this analysis especially during the peak hours. Passengers were unable to board the first train and had to wait for the third train to begin the journey. This study aim to investigate the factors of train delay at KTMB. The objectives if this study is to investigate whether the train delay at KTMB causes by operator factor, network system causes and external factor.A total of 150 questionnaire were collected and the respondents is consists of passengers at KL Sentral and KL station who is using commuters. The results shows that the causes of train delay is due to operator. The second factor is network system. However, external cause is not the cause of the train delay. The result shows that KTMB should take action to improve their quality service. Lastly, results from comparison showed that theres a strong relationship between the data of indoor air quality and feedbacks from respondant. As a conclusion, indoor air quality in train coaches gave impacts towards passengers and environment nearby. Hopefully, this study can help to improve the train services and then can provide a good comfort level for train user.

#### *Keyword: delays, train, commuters, service, operator*

#### Abstrak

Kelewatan masa biasanya berlaku kerana kekurangan tenaga pekerja dan konsistensi set kereta api yang lemah (masalah kerosakan). Hal ini menyebabkan penjadualan komuter sukar dilakukan sehingga menyebabkan kelewatan perjalanan pada setiap hari. Masalah pertama yang dihadapi oleh pengguna KTM Komuter adalah tempoh menunggu yang lama. Rata-rata masa menunggu adalah selama 150 minit, berdasarkan tinjauan yang dilakukan dalam analisis ini terutamanya pada waktu puncak. Penumpang tidak dapat menaiki kereta api pertama dan terpaksa menunggu kereta api ketiga untuk memulakan perjalanan. Kajian ini bertujuan untuk mengkaji faktor-faktor kelewatan kereta api di KTMB. Objektif sekiranya kajian ini adalah untuk mengkaji sama ada kelewatan kereta api di KTMB disebabkan oleh faktor pengendali, penyebab sistem rangkaian dan faktor luaran. Sebanyak 150 borang soal selidik dikumpulkan dan responden terdiri daripada penumpang di KL Sentral dan stesen KL yang menggunakan komuter. Hasil kajian menunjukkan bahawa penyebab kelewatan kereta api adalah disebabkan oleh pengendali. Faktor kedua ialah sistem rangkaian. Namun, penyebab luaran bukanlah penyebab kelewatan kereta api. Hasil kajian juga menunjukkan bahawa KTMB harus mengambil tindakan untuk meningkatkan kualiti perkhidmatan mereka. Akhir-akhir ini, hasil perbandingan menunjukkan bahawa terdapat hubungan yang kuat antara data kualiti udara dalaman dan maklum balas dari responden. Sebagai kesimpulan, kualiti udara dalam kereta api memberi kesan kepada penumpang dan persekitaran di sekitarnya. Semoga kajian ini dapat membantu meningkatkan perkhidmatan kereta api dan seterusnya dapat memberikan tahap keselesaan yang baik untuk pengguna kereta api.

Kata kunci: kelewatan, kereta api, penumpang, perkhidmatan, pengendali

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This final project paper titled," Factors In Train Delay Keretapi Tanah Melayu Berhad A Perspective On Logistic Management " produced by Hanim Binti Bahari Matric No 3201324 has been accepted as having fulfilled the partial requirements for the Master of Business Administration (Supply Chain and Logistics).

(Signature of Supervisor) PROF. DR. HASLINDA ABDULLAH

Date:

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# Title: Factors In Train Delay Keretapi Tanah Melayu Berhad A PerspectiveOn Logistic Management

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I am willing for my marked project paper to be used for staff training purposes.

## Signed: HANIM BINTI BAHARI

Date: 01 March 2021

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#### **CHAPTER ONE**

### INTRODUCTION

#### 1.1 Introduction

Malaysia's railways have played a crucial role in the nation's economic and social growth in today's world, in this fast-paced world where everyone is in a hurry to get anywhere. Heavy rail (including commuter rail), light rail (LRT), mass rapid transit (MRT), monorail, airport rail (ERL), and Penang funicular rail are all examples of rail transportation in Malaysia.Intercity express trains and freight transportation are typically served by heavy rail, while intracity public transportation is served by LRTs, MRTs, and monorail. Peninsular Malaysia's intercity rail network includes the KTM West Coast Line and KTM East Coast Line.The KTM West Coast Line runs between Singapore and Padang Besar, Perlis, on the Malaysian-Thai border. It is used for the KTM East Coast Line between Gemas in Negeri Sembilan and Tumpat in Kelantan.The network was then extended to include 153 kilometers of electrified double track between Rawang and Seremban, as well as between Sentul and Port Klang (Khalid, Bachok, Osman & Ibrahim, 2014).

In 1998, with the launch of LRT, a fully automatic train with driverless linking commercial and high-density residential areas in Selangor and Kuala Lumpur, the rail service was boost. This was followed in 2002 by ERL 's construction linking Kuala Lumpur with the key international airport – Kuala Lumpur International Airport (KLIA). Complementing other public transit networks in the city's business district, the monorail began running in

2003 to serve major industrial and tourist areas, followed in 2010 by the Electric Train Line (ETS). This intercity rail service is the national train service with the fastest meter gage, from Padang Besar in Perlis (north) to Gemas in Negeri Sembilan (south). The MRT system is seen as Malaysia 's latest and sophisticated rail system that has been helping passengers to ease their lifestyle since 2016. Beginning in 2012 for the year 2015, the number of rail passengers was growing (Khalid, Bachok, Osman & Ibrahim, 2014).

Other public transport systems in Malaysia include buses, taxis, ferries, boats, and flights as well as the rail transport service. According to the World Bank (2015), however, only 17 per cent of Kuala Lumpur 's commuters used public transport services compared with 62 per cent in Singapore and 89 per cent in Hong Kong. Such people spend more than 250 million hours a year trapped in traffic, contributing to an overall cumulative expense of transport in 2014 at 1.1 per cent -2.2 per cent of GDP (Khalid, Bachok, Osman & Ibrahim, 2014). As the number of vehicles on the road grew, the condition got worse as a result of a steady rise of newly registered passenger and commercial vehicles reported since a decade ago. Conversely, as reached for 2016, the figures revealed a decline in the number of passengers compared with 2015. The main reason for the decline is that train fares in Malaysia were rising during the end of 2015. However, a slight decline occurred in 2016 and 2017 following the introduction of the Goods and Services Tax (GST) on 1 April 2015.In fact, one of the significant issues concerning the use of public transport is also public understanding and attitude towards public transport.

A 40-minute or more delay is very common in Malaysia with its urban commuter rail network, KTMB Commuter, during the peak hours of the morning and evening weekdays (Khalid, Bachok, Osman & Ibrahim, 2014). The railcars get overcrowded as a result of extended running time, creating a disorderly condition throughout the road. In addition to this, 67 percent of respondents claimed in a survey conducted to assess the attitude of the customers against the commuter rail, that the trains are still delayed. In Indonesia 's case, a report showed that a total of 74 percent of the overall passenger train services arrived later than scheduled time in 2007. This comparatively small proportion means that the bulk of train journeys will end up late arriving. The results of these observations may suggest that individuals could be prevented from using trains as their mode of travel.

There are many solution to decrease the effects of energy scarcity and environmental problems such as global warming and climate change. Promoting public transit is one of the acts to reduce air emissions and the electricity shortage.Sa'adin, Kaewunruen & Jaroszweski (2016) argued that public transport is an alternative strategy to meet developing countries' transport demands in a sustainable and energy-efficient manner.As a developing country, Malaysia is seeking to boost mass urban transport to solve these issues.Community transit providers need to work with local departments to ensure the mass transportation network is efficient.People must radically reform their fossil-fuel-demanding transportation systems to reduce pollution and energy usage that leads to environmental problems.It was highlighted with this suggestion that supporting Electric Multiple Unit (EMU) trains like the KTMBCommuter and LRT would dramatically reduce Malaysia's transportation network to a rail-based public transportation network was implemented. Unfortunately, some public transportation systems in the Klang Valley, especially the KTMB Commuter, do not provide the level of service that users expect.

## 1.2 Background of Study

For such a large population, public transportation is one of the most popular ways to get from one location to another. Thousands of people use public transportation systems every day.In Malaysia, there are several modes of public transportation to choose from, including bus, taxi, monorail, light rail transit, and more. The primary reason Malaysians choose to take public transportation rather than drive their own cars is the rising cost of housing and time management.

In turn, the Land Public Transport Commission (SPAD)(2013) projected an increase in the country's transport demand from 12 million journeys a day in 1991 to 70 million by 2020. This has led to travel demand expectations of reaching 18 million trips per day in conjunction with 75 percent of Klang Valley region urbanization by 2020.As a resultSuhana (2017) discovered that heavy traffic, congestion, high use of non-renewable energy resources and traffic accidents inevitably threatening the quality of life.Public transport allows the mobility of the majority of people, which reduces problems such as congestion of traffic, lack of parking space and air pollution. Accordingly, Zakeri & Olsson (2017) stressed the importance of developing public transport to alleviate these problems in many developing countries.In addition, it may be cheaper to travel by public transport than driving your own transport, which requires one payment for car maintenance, petrol, and toll. In addition, the passengers are free from the stress of traffic jams where they can simply rest and relax while riding on public transport.In this regard, Suhana (2017) urged the government of Malaysia to enhance the efficiency, speed, and comfort of travel, reliability, health, and protection of public transportation as a fundamental strategy for traffic management.

Efficient public connectivity in Malaysia to train stations has made the KTMB train more favoured than other transports. As with all public transports, KTMBCommuter has encountered several challenges such as delays, arrival time on time, modified ticketing systems and delay time. Customer reports on KTM's official website have set delay time as one of KTMBCommuter popular issues. In fact, from 2010 to 2012, almost 78 per cent of respondents reported delays in journeys (Suhana, 2017). Delays that occur will affect the cost and the activities of passengers. If delays are caused by operational issues such as mechanical failures and breakdown of equipment on the network or locomotive engine as well as insufficient train infrastructure such as the supply of coaches and poor quality train sets, repair time is usually long and travel time may increase. Any delay will therefore affect train time schedule. To achieve customer satisfaction, delays in KTMB services must be minimised.

Many factors influence the quality of passenger service. The Satisfaction with Travel Scale (STS) tool, which tests the experience of service in public transportation, has been applied and validated by researchers. The results indicate that service quality is multidimensional, with one cognitive dimension associated with it and two affective dimensions associated with positive activation, such as excitement or boredom, and positive deactivation, such as relaxation or stress. One of the most significant quality factors affecting experience is punctuality. Time-keeping is critical on both the organizational and passenger side. The punctuality is not a simple variable but an indicator that is rather sophisticated. According to Suhana (2017) it is possible to assess both the organisation's operational quality and the technical state of development.

Punctuality is a primary performance measure and success factor for railway networks, and its lack has a negative impact on rail transportation's profitability as compared to other modes of transportation. The standard of rail traffic is influenced by a variety of factors. Brohi, Pillai, Asirvatham, Ludlow, and Bushell (2018) found that the distance traveled and the length of the train were statistically significant factors in determining punctuality. When making a schedule, running time variations are usually applied to the average operating time. The top speed is used to measure the nominal run time. Profile under normal circumstances. The margins in a timetable are used to account for fluctuations in rolling stock results, individual driver driving habits, weather variations, and other factors that may affect the running time. The majority of the time, runtime margins are expressed as a percentage of overall running time. The global recommendations for running time margins can be found in . Standard run-time margins in Europe range from 3 percent to 7 percent, while they range from 6 percent to 8 percent in North America, according to Zakeri & Olsson (2017). A high passenger load, which reduces dwell times, is one of the major causes of delays in New Zealand, according to Xia, Van Ommeren, Rietveld, and Verhagen (2013). Keep in mind that the time spent boarding passengers and refueling at stations is an important factor in overall train service quality. Har had conducted some preliminary research into train delays in the Oslo region. According to them, such delays are often minor in nature, poorly reported, and misunderstood. Climate may have an effect on rail traffic. Environmental factors have an effect on the quality of commuter train services, according to Zakeri and Olsson (2017). Wind rafts, snow, ice, temperature, and leaves all contributed to the system's demise. The mechanisms of delay propagation in the cascade during severe weather were investigated by Xia, Van Ommeren, Rietveld, and Verhagen (2013). Environmental factors have an effect on the performance of train operators and the railway network, according to Xia, Van Ommeren, Rietveld, and Verhagen (2013). When it comes to train punctuality, railway reliability is a major factor to remember.A increasing volume of data and quality of data has allowed analysis to analyze delays and causes of delay on a fairly detailed basis. Machine learning models suggested by Khalid, Bachok, Osman & Ibrahim (2014) to examine the relationship between train arrival delays and chosen railway network characteristics.Gorman has used econometric techniques to forecast congestion delays on US freight rail results. Total train running time was calculated using free running time predictors (horsepower per ton, track topography, and slow orders) as well as congestion variables (meets, crossings, overtakings, number of trains, total train hours, variation in train timing and train departure). In order to create a more consistent timetable system and provide tools for rail network planning, Wallander and Mäkitalo used a data-mining methodology to evaluate rail service delays.

#### **1.3 Problem Statement**

Transit bus delays do not include time spent waiting at transit stops, however the time spent waiting for acceleration and deceleration at the transit stop is included in the delay. Time delays can be avoided when constructing a stable network. All passengers will be able to use public transportation, and congestion and wait times will be reduced, which will have a positive effect on people and their activities. Time-related issues that are persistently linked to the KTMB Commuter. Bad coach supply and inconsistent train sets were the most common causes of time delays (breakdown problems). The high monetary costs of retaining the old coaches have been factored in by Keretapi Tanah Melayu Berhad (KTMB). As a result, procuring spare parts for repair and improvement of the old coaches could take up to six months. The consequences of feeder services, which increased travel time, were another issue that KTMB had to deal with. Trains and buses, for example, are known for irregular schedules, regular delays and cancellations, and a disregard for timetables.Commuters struggle to prepare ahead of time, causing delays in their regular commutes. KTMB was advised to improve train punctuality and frequency (e.g., every 10 minutes) in order to alleviate station congestion, especially during peak hours. The alternative was to allow nonessential trips to be made during peak hours, allowing daily riders to continue riding without interruption. The first problem that KTMB Commuter users have had is a long wait period. The total waiting time, according to the survey conducted for this report, was 150 minutes. Half of them were unable to board the first train during peak hours (morning and evening peak hours) and had to wait for the third train to begin their journey. During peak hours, this issue was common.Enhancing service efficiency by focusing on punctuality, according to Khalid, Bachok, Osman, and Ibrahim (2014), will reduce door-to-door travel times during peak hours, including in-vehicle and out-of-vehicle travel time. The first issue stems from a lack of ticketing capacity during peak hours, which can only be resolved until the use of a contactless card is introduced. Passengers complained about a shortage of ticket counters and the use of ticket vending machines during rush hour. As a result of these improvements, overall wait times and travel times have increased. As a result of the extra waiting period for fare purchases and vehicles arriving late at stations or platforms, travel time increased by more than 25%. (Nordin, Masirin, bin Ghazali & bin Azis, 2017). To put it another way, passengers must begin their journeys 25% earlier than normal in order to arrive at their destination by a certain time.

### 1.4 Main Objective

Based on the problems mentioned above, between the objective and the goal of this study is to describe the problems regarding delays Commuter Train, Railroad Tanah Melayu Berhad in Kuala Lumpur Sentral is as follows:

- 1. To examine customers' perception on service on KTMB
- 2. To examine the logistic performance of KTMB
- 3. What is the delay rate of KTMB Commuter Train for the period 2018 to 2020?
- 4. What are the factors of delay of Commuter Train to consumers?

### 1.5 Scope of Study

The scope of this study is to study the problem of commuter train delays at the main control station which is Kuala Lumpur Sentral station. Its members consist of an Operations Manager, 5 Senior Operations Executives, a Statistics Executive, 6 Operations Executives and 32 Train Control Center Operators (OPKT ). These members are the ones who control the smooth running of all Commuter Trains in Kuala Lumpur Sentral.

This study of train delays is a study that can provide many benefits to all parties, especially the organization whether inside or outside. This study has a lot of impact on the organizations that are directly involved in the infrastructure that involves the trend and is very useful and beneficial to management. , members of organizations, related industries, government, authorities and researchers in the future. This study is also able to help and provide solutions to problems that arise, especially those involving commuter train delays in KL Sentral. In addition, members of the organization will also be able to help to solve problems that arise in an orderly manner to ensure that the services provided are more quality and quality. worthwhile initiatives and bonuses. This study will also be one of the channels for members to provide useful feedback and indirectly the feedback can help the organization to improve the quality of Commuter Train services more efficiently and meet user satisfaction.

### 1.6 Objectives of the Study

Based on the problems mentioned above, between the objective and this study is to describe the problems regarding delays Commuter Train, Railroad Tanah Melayu Berhad in Kuala Lumpur Sentral is as follows:

1. Measure the delay rate of KTMB Commuter Train for the period 2018 to 2020

2. Determine the factors that contribute to the delay rate

3. Examine the impact of commuter delays on passengers and company performance.

4. Propose remedial measures to commuter train delays.

### 1.7 **Operational Definition**

**Delay** :Delay is described as the time difference between the scheduled departure and arrival times announced at railway stations. Delay is sometimes used as a performance metric; however, delay is a measurement of service quality, not performance, and the relationship between delay and capability is complicated. The difference between the travel time and the actual travel time, or the difference between the travel time planned and the actual travel time, is referred to as delay. For each description, the amount of time it takes to complete a task increases as the quality of the service provided decreases. Both planned and unscheduled activities will slow the trains (Mohammad Reza, 2016). Scheduled delays are incorporated as buffer time into the timetable to allow conflicts with other traffic. Unplanned delays are stochastic and are a significant factor in a network's unreliability and volatility.Numerous incidents can cause unplanned delays, including: mechanical problems, malfunctioning facilities, weather conditions, prolonged passenger boarding times, collisions at highway-railway grade crossings and so on. Delays to one train will cause other trains to suffer a

cascading impact of delays. If a path exceeds its potential capability, the probability of a delay leading to additional delays increases, while the ability to rebound from those delays declines.

**Operator Factor :** The two main causes for operator causes are electronics or mechanical malfunctions. This probably applies to the rail cars' bad maintenance. So far as the spare parts are concerned, they are typically imported, very small and costly although their repair costs are fairly modest. Lack of funds and administrative resources for some rail firms also hindered the coaches from routine preventive and corrective maintenance (Mohammad Reza, 2016). This are among the reasons why cars sometimes breakdown or leave unrepaired on the track.

**Network System:**These considerations included passenger numbers, occupancy ratios (passengers to seats), use of network resources, cancellations, temporary speed cuts, work on railway building, timeliness for departure and arrival, and organizational priority guidelines.There was a statistically significant correlation between the arrival time and the number of passengers, the occupancy ratio and the punctuality of departure (Mohammad Reza, 2016). Operational train priority rules have also affected punctuality; these state that a timed train has a higher priority than a delayed train

**External Factor** :One of the factors leading to the disruption of the timetable of commuter trains is external reasons. The service disruptions triggered by external causes typically include incidents outside the rail operators' plans, which may be due to third-party or seldom occurring exceptional incidents.

Climate factors have an significant impact on railroads in Malaysia. These conditions can affect the efficiency of operations, the physical infrastructure, as well as the secure movement of goods and people. Railways operate in a range of weather conditions, some of which are particularly challenging for rail transportation. They also include critical elements such as the season and time of day.

Derailments are the eventual consequence of all weather-related train crashes and injuries of around 75 per cent (Yi, Wan, Haldorai, Rahman, Haque, Haibin, & Shengnan, 2018). About half of all these derailments is most closely associated with excessive temperatures, precedent flooding and background conditions of snow and ice. More deaths, casualties, hazmat releases and evacuations were also caused by the derailments than other forms of accidents.Collisions are less frequent compared to derailments. That have collisions with head-on, rear end, side effect, raking and grade-crossing. High winds, fog, and preexisting concentrations of snow and ice are among the most common causes of collision events associated with the weather.Obstruction type events cause railway track to be blocked by rock debris, Slides, mud-slides, avalanches, fallen trees and the like. Such obstructions are most often linked to weather-induced slides and high winds.

### **1.8 Organizational Background**

History of establishmentMalayan Railways Limited (Malayan Railway; abbreviation: KTMB) is the main train operator in the Gaza Malaysia.Dahulunya it is known as an agency under the Malayan Railway Administration, it is now known as the corporatisation of KTMB as the impact of government-led campaign in 1992. However, KTM is still fully owned by the federal government. The history of its wagon system dates back to the British colonial era, when the original railway line was built to transport tin.

However, its important to train service in Malaya began when the first route opened from Taiping to Port Weld (now Kuala evening) on June 1, 1885 in the British Perak.Kerajan consolidate all train services in each state and named Railways State- Federated Malay states (FMS) in 1901.Menjelang NMB 1941 has been instrumental in the development of the railway service of the State, namely a system of complete railroad built in Malaya and the name was changed to the Malayan railway (KTM) in 1948 On 31 July 1957, the used trains were upgraded from steam locomotives to electric diesel locomotives which started operating.The name of the Malayan Railway was transferred back to the Malayan Railway (KTM) on August 1, 1992, following the Government's decision to make the Malayan Railway Berhad as company korporat.Langkah infrastructure improvements also continue to be implemented with increased single track to double track electric route to Batu Caves Port Klang and Seremban to Ipoh. Apart from that, the double track project for the Seremban to Gemas route and the Ipoh to Padang Besar route is still under construction.

On August 3, 1995, Electrical Unit (EMU) was the first to start a service perkhidmatannya.Dari Trends Trends commuting class 81, Class 82, Class 83 and the latest trends Commuter six coaches on December 19, 2009, the Malayan Railway Berhad recorded another milestone when The Electric Train Set (ETS) as per appendix 4 which can reach a maximum speed of 160 km per hour, was received and started operating in June 2010. Trains

Tanah Melayu Berhad (KTMB) will continue to move forward in implementing various reforms and improvements that will improve the economy.

**Mission** :The mission of the Malayan Railway Berhad, the main choice of ground transportation system by providing integrated rail service that is safe, efficient and reliable service for passengers and customers. Malayan Railways Limited will:

1. Competitive and responsive to market demands.

2. Achieve goals through a highly trained and visionary workforce using modern technology and continuous innovation.

3. provide reasonable profits and long -term growth to shareholders.

#### **1.9 Services**

The railway operations business is an important and vital component of the service industry, which has great potential for further growth. Malayan Railways Limited has always been the main operators in the land transport sector in the country, transportation of passengers and cargo services throughout the rail network in the Gaza Malaysia.Rangkaian railway linking strategy of industrial growth centers in rural areas to the sea ports such as Penang Port, Port Klang, Port Pasir Gudang and Port Tanjung Pelepas. It also serves as the backbone for cargo services linking cross -border movements between Malaysia and Thailand. Complete development

rapid modes of transport, such as road, sea and air, the Malayan Railway Berhad continues to focus on providing train service safe, efficient and reliable service for passengers and customers. The length of all railway lines is 1,699 kilometers. All of the lines of the Malayan Railway Berhad is a single track, but some of the main routes, ranging from Ipoh to Seremban and also track branches from Batu Caves to Port Klang, which are now built double track system, electrification with 25 kilo voltage alternating current to provide Commuter Train service.

**Intercity Train Service:** Intercity train service refers to the intercity train service dieselpowered cities in Peninsular Malaysia, Singapore, and the Nation Thai operated by Keretapi Tanah Melayu Berhad (KTMB). Most of the service operates from Kuala Lumpur Sentral station in Kuala Lumpur. However, there are some services that only operate on the Coast track East between Tumpat and Gemas and continue to Singapore. There is also one crossborder train service between Butterworth and Bangkok, Thailand. Mail trains are generally also referred to as trains local or local trends. All passenger trains on the West Coast runway are express trains except for one local train service between Singapore and Gemas which only stops at major stations. Landasan Pantai Timur tracks still have mail trains stopping at all stations and stops.



**Commuter Train Service :**Train for commuters The Commuter Train is a public transportation system that began operations in mid-August 1995 with the aim of providing excellent service and alleviating traffic congestion in the Klang Valley. Commuter trains now run on a 150-kilometer track between Rawang and Seremban, as well as between Batu Caves and Port Klang, carrying nearly 60,000 passengers per day.

