Review on Malaysian Rail Transit Operation and Management System: Issues and Solution in Integration

Mohd Idrus Mohd Masirin, Aminah Mohd Salin, Adnan Zainorabidin, David Martin, Norshakina Samsuddin

Faculty of Civil and Environmental Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia

Corresponding author: idrusmas@gmail.com

Abstract: In any context, operation and management of transportation systems are key issues which may affect both life quality and economic development. In large urban agglomerations, an efficient public transportation system may help abate the negative externalities of private car use such as congestion, air and noise pollution, accident and fuel consumption, without excessively penalizing user travel times or zone accessibility. Thus, this study is conducted to appraise the Malaysian rural rail transit operation and management system, which are considered important as there are many issues and solution in integration of the services that need to be tackled more conscientiously. The purpose of this paper is to describe some of the most important issues on integration of services and rail transit system in Malaysian and how to solve or reduce these problems and conflicts. In this paper, it consists of the historical development of rail transit construction in Malaysia. This paper also attempts to identify the important issues related to rail transit services and integration in Malaysian rural rail operation and management system. Comparison is also conducted with other countries such as UK, France, and Japan. Finally, a critical analysis is presented in this paper by looking at the possible application for future Malaysian rail transit operation system and management, especially focusing on enhancing the quality of Malaysian rural rail transit. In conclusion, this paper is expected to successfully review and appraise the existing Malaysian rural rail transit operation and management system pertaining to issues & solution in integration. It is also hoped that reformation or transformation of present service delivery quality of the rail transit operation and management will enable Malaysia to succeed in transforming Malaysian transportation system to greater heights.

1. Introduction

The railway in Malaysia is a major by-product of the industrial revolution and has been playing a major role in the economic and social advancement of the nations, wherever they exist. It was developed as private owned public utility, serving the dual purpose of earning a profit to the owner and at the same time providing service to the society in form of an affordable transport mode both for personal mobility and for transport of their goods [1]. Rail transport in Malaysia comprises of heavy rail (including high-speed rail), light rail transit (LRT), monorail and a funicular railway line. Heavy rail is mostly used for intercity passenger and freight transport as well as some urban public transport, while LRTs are used for urban public transport and some special use such as transporting passengers between airport buildings. Presently, there is one high-speed railway line with two high-speed train

services linking Kuala Lumpur with the Kuala Lumpur International Airport that is the Express Rail Link network or ERL. The sole monorail line in the country is also used for public transport in Kuala Lumpur while the only funicular railway line is in Penang.

2. Types of Rail Transportation in Kuala Lumpur

The rail transportation in Kuala Lumpur is in its early development but yet has grown quite tremendously in the last 10 years. The introduction of various urban rail transit systems were able to reduce the mobility difficulties among the city population. The followings are some examples of the rail transit system in city of Kuala lumpur:

2.1. KTM Commuter

It is an electrified commuter train service first introduced in 1995[2]. KTMB provides 248 commuter services daily, serving 45 stations along 175 route-kilometers. The network consists of three lines. Rawang-Seremban route, Sentul-Port Klang route, and Rawang –Kuala Kubu Baharu Shuttle route. It shows in Figure 1.The trains on the two lines run at 15 minutes frequency during peak hours and 20 minutes frequency during off-peak hours. The Rawang-Kuala Kubu Baharu shuttle service operates at half hour frequency. Commuter Coaches are currently the most modern in the KTM fleet and air-conditioned [2].

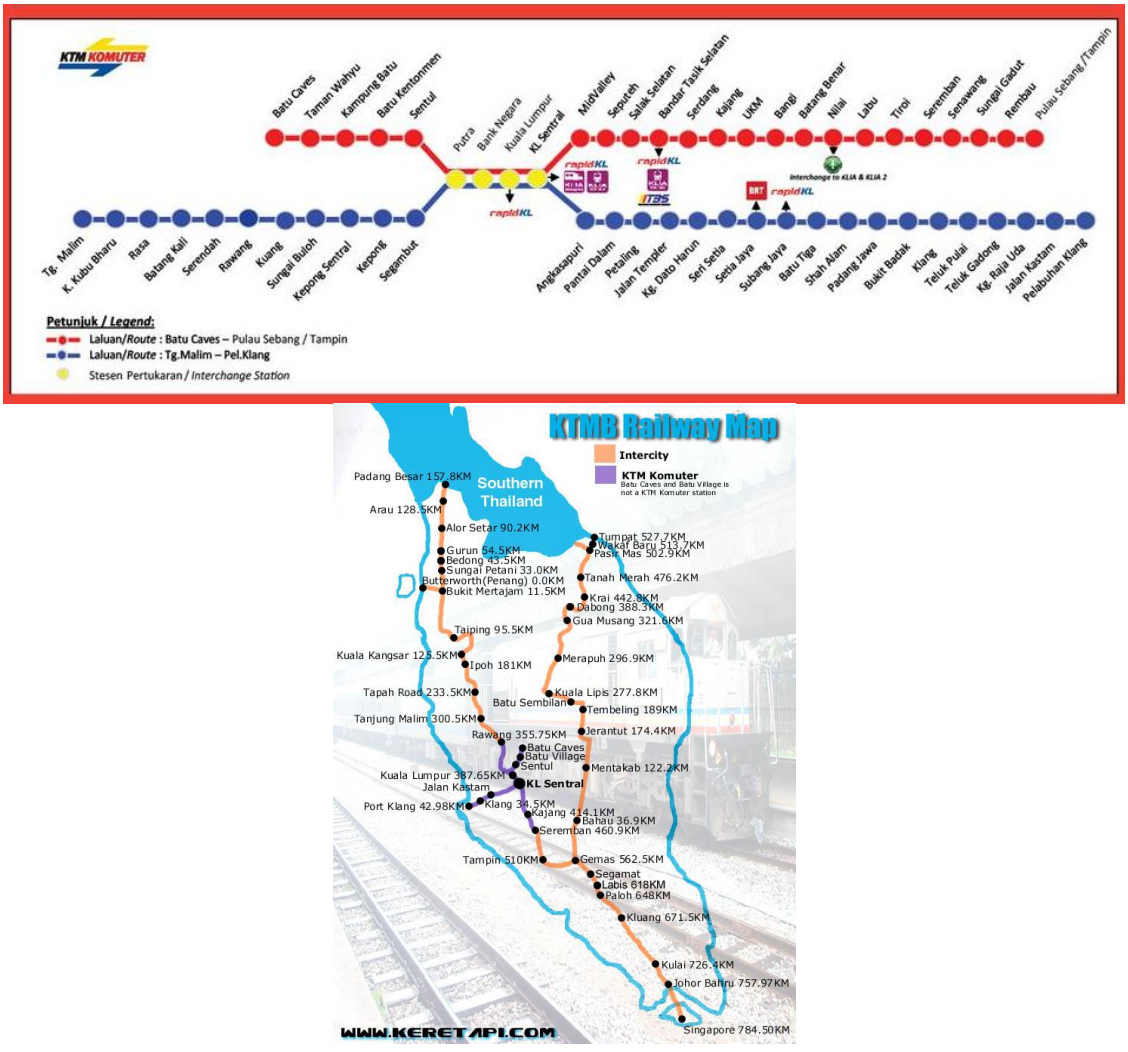

Fig. 1 Map of the Passenger Services of KTMB and the Commuter Rail

Commuter Rail and LRT are available for travelers in the Kuala Lumpur region of Malaysia. There are handfuls of interconnection points between LRT including the Bank Negara and Bandar Tasik Selatan stations as well as Sentral Kuala Lumpur. There are connections to the Kuala Lumpur International Airport at Nilai and Sentral Kuala Lumpur stations as well (See Fig. 1). Commuter Rail (in 2003) reportedly handles approximately 70,000 passengers per day; with Sentral Kuala Lumpur station handling 10,000 passengers per day. KTM Komuter serves 40 stations with 213 daily runs Monday through Friday, 218 runs on Saturdays (Note: Malaysian Saturdays are considered workdays), and 177 runs on Sundays and Holidays [3].

2.2. Light Rail Transit (LRT)

Light rail transit (LRT) or Light rail is a type of mass transit system that uses rail cars that are generally of lighter weight than typical rail cars and is usually operated by electricity. In Malaysia, LRT systems in the Kuala Lumpur area consist of two system:

(1) STAR LRT. The older Ampang Line Formerly known as STAR Line (Sistem Transit Aliran Ringan Sdn.Bhd). In 1990, Taylor Woodrow, a British company, finance and constructed the 850 million STAR LRT in Kuala Lumpur, creating one of the largest privately financed infrastructure project in the world. He developed the proposal for a total rail system in the rapidly developing capital. The construction started in 1993 and the full 27 km system opened to the public in 1998 [4].The STAR Lines is manage the 27 km track that comprises of north-south line and another going eastward. There are consists of two lines, running between the suburb of Sentul in the north of Kuala Lumpur, and Ampang in the east, as well as Sri Petaling in the South. Trains branch off to either Ampang or Sri Petaling at Chan Sow Lin Station about midway of both lines. The system is mostly at-grade outside the city, and elevated with it runs through the city. Unlike the trains on the Kelana Jaya Line , those on the Ampang Line have drivers [2,5].

(2) Putra LRT. Putra Lines (*Projek Usaha sama Transit Ringan Automatik Sdn. Bhd.)* is a driver-less automatic system and 29 km long, running between northeastern suburbs of Kuala Lumpur and Petaling Jaya to the west of Kuala Lumpur. The Putra LRT network has 24 stations (5 station underground, 18 elevated, 1 atgrade) at 1.1km intervals along its 29km and was constructed in two sections: Lembah Subang to Pasar Seni/ Central Market (14.1km), and Pasar Seni to Ampang Park and Terminal Putra in Gombak (14.9km). The system is provide commuters between the city's eastern (People's Park) and western suburbs (Gombak) with a fast, efficient east-west route by passing some of the most congested roads in the world servicing some of the most affluent and heavily populated areas. Kuala Lumpur Mass Transit defines that the system opened to the public in 1999 be the longest fully-automated driverless metro system in the world [6]. PUTRA LRT operates with 35 two-car fully air-conditioner units traveling at an average of 40km/h (max = 80km/h). The initial capacity is 10,000 passengers per hour per direction and is expected to increase to 30,000 in the near future. The service is provided from 6am to 12 midnight, 7 days a week. The peak hours are from 7am to 9am and 4pm to 7pm from Monday to Friday, and Saturday from 7am to 9am and noon to 2pm. Frequency of service during peak hours is between 90 seconds and 3 minutes [6].

2.3. Kuala Lumpur Monorail.

Malaysia's only monorail system is used for public transport in Kuala Lumpur (refer with Fig. 2). The monorail is a public transportation system based on the single track (mono) in the form of vehicles placed and served by a particular trajectory hovering above the ground [7]. Kuala Lumpur Monorail was constructed in 1997, started with the construction of building facilities and runway depot building above ground. It is 8.6 km long and currently, it has 11 stations and consists of two parallel rails for most of the way except at the end stations where switches merge the two rail into a single rail before entering the station. The entire network is elevated with a two-car trains which were manufactured in Malaysia. Project transportation spends of RM 1,180 million and started operating on August 31, 2003

by the KL Infrastructure Group Company which holds the concession for 40 years operating monorail from the royal government of Malaysia. On May 15, 2007 with the financial crisis in the company, KL Monorail was taken over by Syarikat Prasarana Negara Berhad (SPBN), a Government Company under the Ministry Of Finance. And subsequent operation carried out by KL Star Rail Sdn Bhd [7,8]. The advantages of monorail systems includes requiring minimal space for operation, not much interfere with existing traffic flow, more cost effective and time saving in the construction of the foundation/rail compared with a conventional runway [8].

Fig. 2 Types of Railway System

3. Issues and solution of integration on railway system in Malaysia.

There are various types of public transportation available at Kuala Lumpur nowadays. The government spends an enormous amount of money to provide public transportation especially in rail transit development LRT, monorail, and commuter rail and also in promoting transportation to be main preference for the citizen as their daily transportation to reduce the traffic congestion happened at Kuala Lumpur. In the 10th Malaysia Plan, which is government roadmap for development in Malaysia over the next several years, emphasis was given on improving the quality of life in urban areas and a concern for environmental issues but there are few direct references to public transportation. Infrastructure projects such as the LRT systems and the monorail were built and they have their own feeder bus service with set schedules and routes. However,separate, incompatible, fare and ticketing systems for the various modes and services created problems for passengers [9]. Initiatly, ridership was low, representing only approximately 20% of total person trips in Kuala Lumpur, as compared with cities in neighbouring 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. Most people would rather drive than take public transportation. Thus, a low level of service makes it much more difficult to attract riders. Recently, many of transportation companies 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 over RM10 billion efforts to enhance KL public transportation was initiated [9]. Thus, Prasarana Malaysia Berhad (Prasarana) was established by the govrment. An efficient and effective public transportation system can help abate the negative externalities of private car use (such as congestion, air and noise population, accident and fuel consumption) without excessively penalising user travel times or zone accessibility [2]. Furthermore, because of traffic problems in cities such as Kuala Lumpur, the possibility of rail transport as an alternative urban transport is a really important matter for the government and population, and raises a great debate on sustainable urban mobility in which the benefits that motorized travel would bring to the community [10]. Moreover, the high density contexts represent an idea of framework in which to adopt rail systems. Although rail transit require huge construction, operating and maintenance costs than other public transport systems, high performance stemming from the use of exclusive lanes, the constrained drive and the signalling systems allows rail system to achieve lower unit costs per seat-km. In the case of rail systems, externalities such as pollution or fuel consumption are also lower than those of other public transport systems. Thus, in order to solve the problems of rail services efficiently and effectiveness SPAD and operates have to sit

together and formulate better policies to enhance their services. Big budgets alone could not solve the problems and SPAD can be the mediators for rail operators.

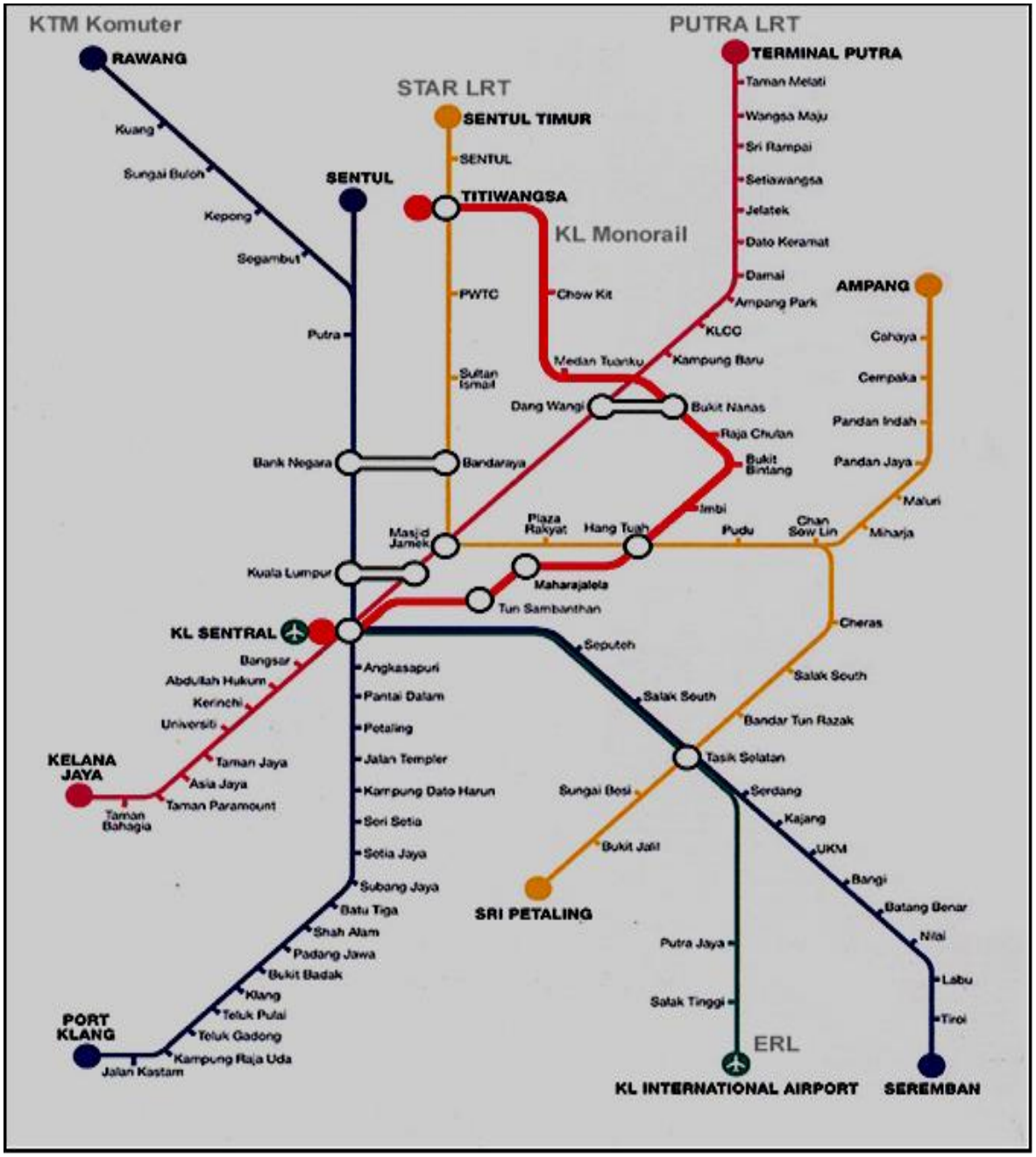

Fig. 3 Kuala Lumpur Railway System in Malaysia (2014)

4. Comparisons and analysis of train systems pertaining to system integration.

Based on the free study in three countries that is UK, France, and Japan comparisons in terms of their structure, roles and objectives as demonstrated in the followings:

4.1. Railway in the UK.

The UK state (British Rail and BR) was privatised from 1993, and took 91/440 very much to heart. BR's infrastructure was spun off into a company, Railtrack, first publicly owned, then privatised. BR's

operational units, being 25 territorial groupings of passenger services under the three original sectors of Network SouthEast, Regional Railways and InterCity, were franchised attempting to maximise their value to the Treasury [7]. In 2000, the main regulatory body, OPRAF, became the Strategic Rail Authority, who were to additionally take a strategic overview previously non existent in the privatised structure. This was now necessary as the railway privatised on the basis of declining passenger numbers was now growing rapidly. BR's freight businesses were sold off, and this became an entirely commercial operation, in contrast to the passenger franchises, 21 of which remain subsidised in 2001/2002, with 3 of those remaining effectively paying the government for the right to run the service (the exception, Midland Mainline, has negotiated a zero subsidy, zero premium profile). In addition, there are three passenger businesses running trains on "open access" (non franchised) terms, and one metro system (two from 2002) using parts of the Railtrack network [11]. Some small parts of the infrastructure are owned by other companies who have to agree access rights with operators and timetabling over the boundary with Railtrack.

4.2. Railway in France.

Railway reform has also taken place in France, albeit at a less of a structural level than the other countries under study. In order to comply with 91/440, the state railway SNCF (*The French State Railway*) was first restructured to give an accounting separation between infrastructure and operations, and reorganised again in 1997 into the train operator SNCF and the infrastructure operator RFF (literally " French Railway Network", The infrastructure operator) [12]. RFF owns the track and performs a strategic management role, but contracts the maintenance back to SNCF, giving them more control over their infrastructure. SNCF also remain, to all intents and purposes, the monopoly operator. SNCF's passenger services are structured into three main operating units – Grandes Lignes, who operate TGV (*The French High Speed Network)* and other InterCity services, Ile de France, operating services in the region around Paris, and TER (*Train Express Regional)*, the operator of local and regional trains in the rest of the country. These broadly align with the InterCity, Network SouthEast and Regional Railways groups of the former BR. Each regional council has a contract with TER to deliver a specified level of train services, and these are funded accordingly by the state government. Freight is operated on commercial lines, and there is a limited amount of competition from small operators.

4.3. Railway in Japan

Japan has taken a different approach to the other, European countries in the other countries study. The geography, with large mountainous areas and much of the population concentrated on the south coast of the main island, Honshu, creates high density passenger flows along a main coastal corridor. Together with the highly urbanised nature of Japanese cities, this creates an incredibly dense demand pattern. These have generally been seen as more efficient than the state owned monopoly of JNR (*Japan National Railway)* [13]. In response to JNR's growing debt and in order to inject some of the innovation and efficiency perceived as characteristics of the private railways, it was privatised from 1987 [14]. Six regional companies (known as JRs) were created operating all types of train within the region which allows cross subsidisation between profitable intercity services and loss making rural lines. In contrast to what is now the general pattern in Europe, the JRs are vertically integrated, owning and operating their track, but still require an accounting separation so that access for through running is granted fairly. The JRs run some through trains into each other's regions, and there are also freight operators, who run on other operators' tracks, and some private railways may also use JR facilities. The Japanese Shinkansen high speed rail network was split between the JR regions, with each service allocated to an operator who pays the other JRs along the route access charges. The JRs run inter regional services on each other's tracks, and there is also through running both of private railways' trains on JR tracks, and of JR trains on other tracks (such as those owned by an airport or a municipal body, for example). This creates a complex web of interrelationships between the railway

companies, which, remarkably, is largely free of regulation, with track access fees agreed on a commercial basis.

5. Conclusion

This paper has shown that some of the most important issues on integration of services and rail transit system in Malaysian and how some countries have solved or reduced these problems and conflicts. Historical development of rail transit construction in the world and Malaysia has given us some insight of how rail transit system can assist in enhancing the life of population in cities especially in Kuala Lumpur. Comparisons were conducted with other countries such as UK, France and Japan which demonstrated that Malaysian rails are growing quite rapidly. The demands are there to be exploited thus making railway transportation system the future of Malaysian public mobility network. The possible integration of the network which has started with the urban rail transit in Kuala Lumpur looks promising linking the Putra Line, Star Line and Monorail system will be an advantage to the public commuters. Future efforts by the government to link or integrate the urban rail transit with KTM Komuter, ERL and other rail service will enhance public mobility. Thus, it will create better and improved rail services in cities. Kuala Lumpur urban rail transit integration is an excellent model for other cities in Malaysia.

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