

Appraisal on Malaysian Rural Rail Transit Operation & Management System: Issues & Solution In Integration

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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, Germany, The Netherlands, Switzerland 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.

Introduction

The railway in Malaysian 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 [20].

History of Early Railway System On Malaysian

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.

KTM Komuter

According to Hasnan (2012) that KTM Komuter is an electrified commuter train service first introduced in 1995, catering especially to commuters in Kuala Lumpur and the surrounding suburban areas. 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 show 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 services operates at half hour frequency. Komuter Coaches are currently the most modern in the KTM fleet and air-conditioned [8].

Commuter Rail and LRT are available for travelers in the Kuala Lumpur region of Malaysia. There are handful 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 Figure 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 [13].

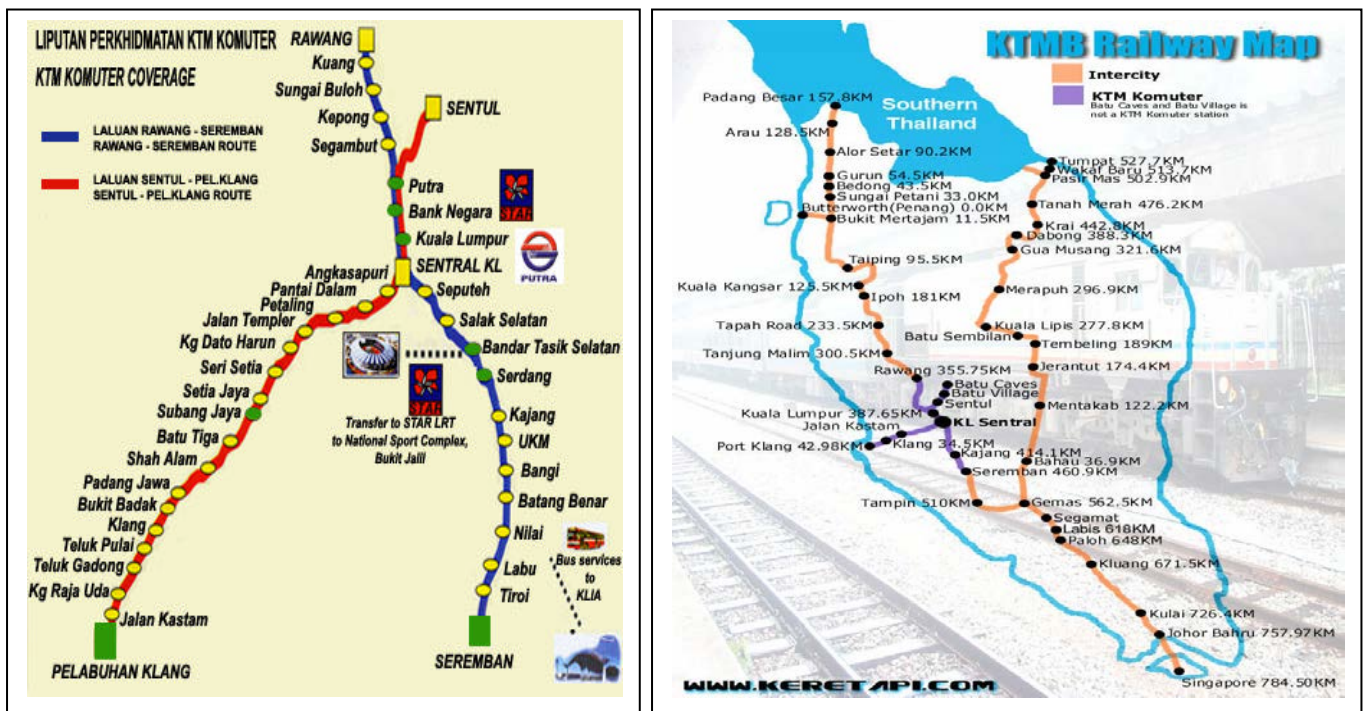


Figure 1 A Map of The Passenger Services Of KTMB And The Commuter Rail

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. The rails of such a system may also be narrower than that of standard railroad gauge. The system is not necessarily a new technology, but rather an update of street car technology that used to run in some cities. In Malaysia, LRT systems in the Kuala Lumpur area consist of two system :

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 [9].

The STAR Lines is manage the 27 km (17 mi) 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 [8,12].

PUTRA LRT

PUTRA Lines (*Projek Usaha sama Transit Ringan Automatik Sdn. Bhd.*) is a driver-less automatic system and 29 km (18 mi) 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 (18mi length, and was constructed in two sections : Lembah Subang to Pasar Seni/ Central Market (14.1km =21mins), and Pasar Seni to Ampang Park and Terminal Putra in Gombak (14.9km = 24 mins). 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. Total travel time on the 29 km route is 45 minutes cutting short the travel period by car by at least an hour [12].

Based on Kuala Lumpur Mass Transit (2014) to define that the system opened to the public in 1999 be the longest fully-automated driverless metro system in the world. PUTRA LRT operates with 35 two-car fully air-coditioner units traveling at an average of 40kmph (max = 80 kmph). The initial capacity is 10,000 passenger per hour perdirection and is expected to increase to 30,000 in the near future. Information systems on board each vehicle will allow each station on the system to be illuminated on a map display as the train approach. The service is provided from 6 am 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 [9].

Kuala Lumpur Monorail

Malaysia's only monorail system is used for public transport in Kuala Lumpur (refer with Figure 2). The monorail is a public transportation system based on the foundation/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 buildingl above ground. It is 8.6 km long, running form Titiwangsa in the north of central Kuala Lumpur, to KL central just to the South of the city center. Currently, it has 11 stations. The line 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 [7,13]. 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 [3].



Figure 2 : Types Of Railway System On Malaysian (2014)

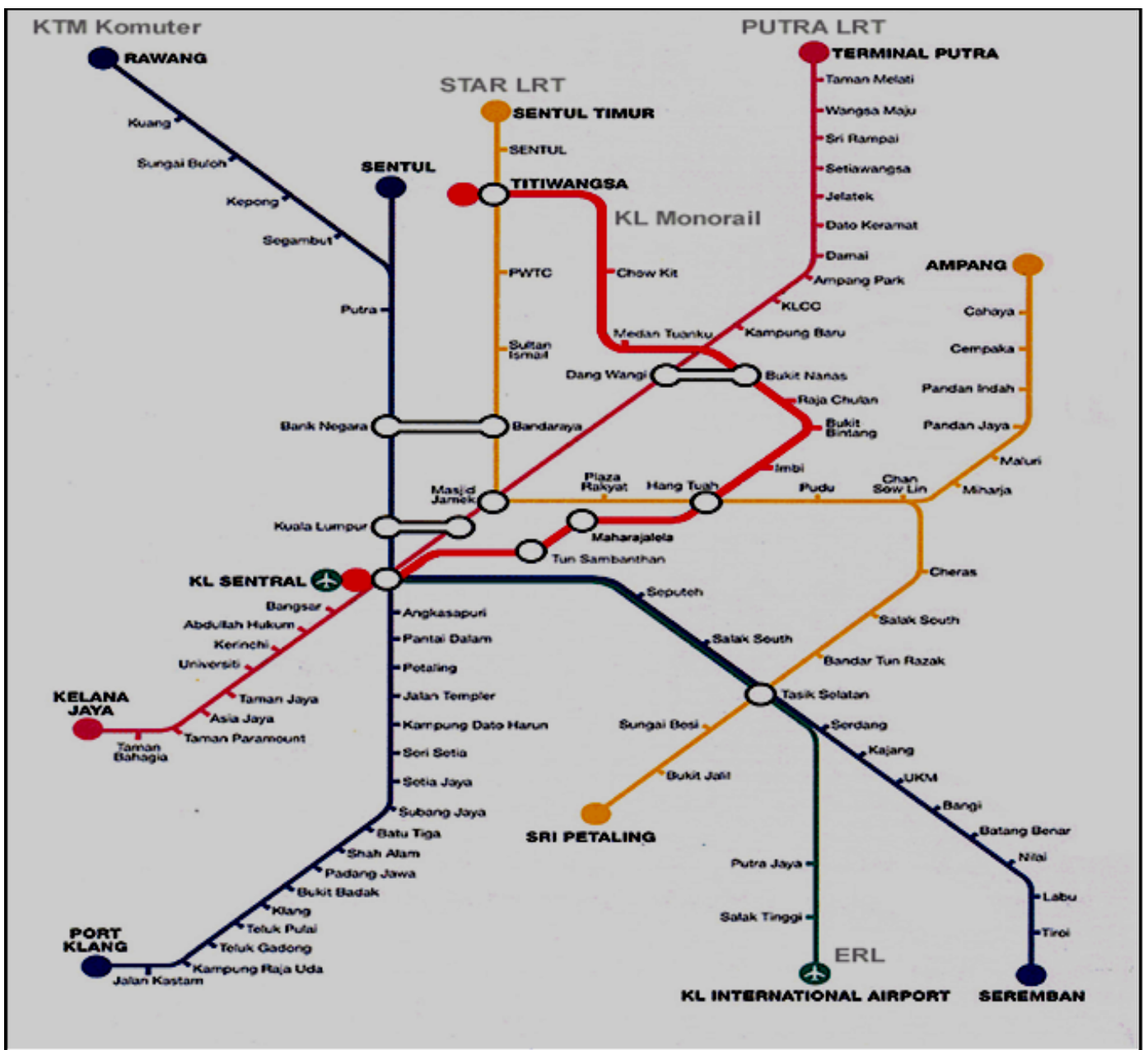


Figure 3 : Kuala Lumpur Railway System On Malaysian (2014)

Issues and solution of integration system railway on Malaysian.

Public transportation in Kuala Lumpur consists of buses, LRT (Light Rail Transit), monorail, airport express rail link, and commuter rail. There is various type of public transportation available at Kuala Lumpur nowadays. Government had spend an enormous amount of money to provide public transportation especially in rail transit development (LRT (Light Rail Transit), 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. However, the number of people that interested to use LRT, monorail and commuter rail as their public transportation is still unsatisfied. There are many problems in the previous system, that :

Firstly, the interchange point before the user arrived at the destination is not mention. The public or tourist that pelan to go the certain destination may not know where is interchange point of station that they must go throught from one location to another location before they able arrived at the intended destination key wish to [1].

According to Starcey (2003) in *Public Transportation in Kuala Lumpur, Malaysia* to discuss about general issues and problems public transportation that 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 issues. In the 10th Malaysia Plan, which is 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. 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 [21].

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 [21].

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.

In any context, the management of transportation systems is a key issue which can affect both life quality and economic development. In large urban agglomerations, an efficient public transport system can help abate the negative externalities of private car use (such as congestion, air and noise pollution, accident, fuel consumption) without excessively penalising user travel times or zone accessibility [8]. 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 (as described in M.S.G.Tobias¹, M.L.A.Maia² & I.M.D. Pinto³)

Moreover, according to L.D'Acerno¹, M.Gallo², B. Montella¹, & A. Placido¹(2012) described that high density contexts represent the ideal framework in which to adopt rail systems. Although they require greater construction, operating and maintenance costs than other public transport systems (such as buses, trolleybuses and taxis), 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 (example : vehicular capacity multiplied by travel distances). Likewise, in the case of rail systems, externalities such as pollution or fuel consumption are also lower than those of other public transport systems.

Comparisons and analysis of train systems pertaining to system integration.

Base on the free study at six countries such as UK, France, Germany, the Netherlands, Switzerland and Japan will be compared in terms of their industry structure and the roles and objectives of each party at each level of planning and delivery.

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 [17]. 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. A further unusual aspect of the UK system is that BR's rolling stock was transferred to leasing companies to ensure its transferability as franchises are reawarded [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) [5]. 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 [2].

Railway in Germany

Change on German railways was driven by the desire to see profitable services pay their way and help to reduce Deutsche Bahn (DB)’s debt [11]. In 1994, DB was reorganised as a commercial organisation owned by the federal government. Subsidiary companies deal with the track (DB Netz), stations and ticket sales (DB Station&Service), long distance passenger services (DB Reise&Touristik), regional passenger services (DB Regio) and freight (DB Cargo). All are commercially led. DB Reise&Touristik runs the profitable InterCity and InterRegio services across Germany, but local services are specified and subsidised by the Land (region) and put out to competitive tender. DB does not have the monopoly, and a variety of different operators now run local services. Like the private operators, DB is expected to make a profit on these franchises, therefore it bids on a level playing field. A published schedule of track access charges is produced by DB Netz [4], and DB Station&Service also charge operators for access to their stations, as well as operating the ticket offices and allocating sales revenue. An organisational peculiarity is that to preserve their civil service status and the jobs of those working on franchised regional services, DB staff at reorganisation have had their employment transferred to the Bundeseisenbahnvermögen (BEV), a government owned organisation who hire them back to the operators.

Railway in the Netherlands

As in Germany, reorganisation in the Netherlands focuses both on separating infrastructure and operations, and the tendering of certain train services to a franchisee. Again, express and InterCity services fall under the control of NS Reizigers, the state railway, and local services are in the process of being franchised. Some of these include complementary bus services creating a regional integrated transport system. Services on the HSL-Zuid high speed line to Belgium will also be franchised. NS is capable of bidding for the franchises in its own right, but in practice has sought partnerships with other companies, such as the UK’s Arriva (with NoordNed) and National Express Group (for the high speed line). The operation and ownership of infrastructure is rather more complicated in the Netherlands than in most other countries. The latter two are directly under the control of the Transport and Waterways Ministry (MVW), but potentially, all four could be privatised in whole or part. As in Germany, fares are collected by the separate stations organisation, who also charge operators for use of their facilities. These are then allocated to the operators concerned. Fares are set, along with conditions for accepting multimodal tickets such as the Stippenkaart, by MVW. Lossmaking local services are franchised by the region, but funded by MVW, who also fund NS Reizigers’ lossmaking services. The minimum service level is specified by the Ministry, while the franchisees’ contracts to provide the services are with the regions. Regions can also replace lightly used rail services with buses where it is thought necessary. Against this specification, capacity allocation is carried out by Railned, with each operator trying to obtain the paths most suitable for them and Railned attempting to provide the most efficient allocation of

capacity. This system has not been without its problems, and the separation of traffic control from both operations and a worsening infrastructure have led to a sharp rise in delays [19].

Railway in Switzerland

Swiss railways have always included a large “private sector” element, around 40% of the network length in the country is owned by vertically integrated private railways. However, though these are commercially led organisations, their ownership is not usually in the private sector, most are independent publicly owned organisations under the control of municipal or cantonal bodies. This long tradition of separate railway companies has always included a significant element of cooperation between companies, and in fact there has been virtually no competition between them and the state railway SBB (*Swiss Federal Railways, Germany*), CFF (*Swiss Federal Railways, French*), and FFS (*Swiss Federal Railways, Italian*) [22], largely due to the regulatory system in place which effectively gives the private railways local monopolies. Faced with worries over cost efficiency, the government reorganised all public transport subsidisation from 1996, placing responsibility for granting concessions with the Cantons. In addition, as Switzerland is a non EU country completely surrounded by EU member states, it was decided to adopt an accounting separation between operations and infrastructure compatible with 91/440. Essentially, SBB now has a structure similar to that of DB, with separate organisations for track and train services. Like Germany, local services are tendered out to a concessionaire, who can be either SBB or another organisation such as a private railway, and SBB has been restructured into a commercial company with the Confederation (National government) taking up some of its debt. The Confederation also sets the strategic plan every 4 years together with the funding required to deliver it. On the main SBB network, concessionaires have a very different status to private operators on their own infrastructure, as they pay SBB for track access, and are more closely regulated, having service levels specified by the cantons. The private railways are much freer to develop their timetables and other aspects of their businesses [2].

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 meaning Japan’s railways carry more people than any European system. There has also been, as in Switzerland, a strong tradition of rail service provision by other companies, and again these private railways contain a number owned by the public sector, though many more are under 100% private ownership. These have generally been seen as more efficient than the state owned monopoly of JNR (*Japan National Railway*) [14]. In response to JNR’s growing debt (the same precursor to reform as in Germany), and in order to inject some of the innovation and efficiency perceived as characteristics of the private railways, it was privatised from 1987 [18]. 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 lossmaking 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 (particularly JR Freight), who run on other operators’ tracks, and some private railways may also use JR facilities. The 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. [2].

The four EU countries have been forced to facilitate international services, and the model of a track authority and separate operators allowed access on a level playing field has emerged in most countries despite only an accounting separation being required by law (although in France, only a minimum is done in practice, and all operators have an SNCF shareholding). In Japan a combination of vertically integrated operators, operators of trains only, and track authorities who could even be non-railway companies such as airports. This, however, functions in a similar way, with access rights negotiated between operators. Because of the sheer density of traffic, rail operators carry volumes of passenger's way in excess of any European railway. The number of operators and the complexity of the interrelationships between them dwarfs that in any of the European systems (which are all increasing in complexity thanks to the adoption of a track authority model and rail service franchising). Thanks to the traffic density and the number of competing railways, as well as the cooperative nature of Japanese culture, the system is not only largely free of regulation, but also of strong contentions between operators. Within Europe, a standard model seems to be emerging, where the state operator runs the profitable InterCity and inter regional services, and less profitable lines are franchised with an input from regional government. Only the UK differs significantly (though in France all the regional franchises are with SNCF) in having its primary national network split and franchised. This produces a less structurally integrated network, though there is no objective evidence to suggest that is fundamentally detrimental in itself. In terms of the timetable, and the rail service offered, the countries again differ. The standard European model creates a top-down planning approach with the primary national services planned first, and everything else fitted around them.

In the UK, all parties are in theory equal and bid for paths from the track authority, while in Japan parties bid for track rights on a system where if there is no agreement there is no change. Both are more of a bottom-up approach. However, in terms of the capital to second city service at least, the service frequency offered is consistent with the average density of passenger traffic and probably owes more to a demand led approach for this key flow. Other flows are generally on standard hour patterns on all lines except in the UK, France and Japan (where, excepting France, standard hourly patterns exist on most busier routes), as this simplifies timetable production [2].

Conclusion

This paper has shown that 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 also consists of the historical development of rail transit construction in Malaysia and 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, Germany, The Netherlands, Switzerland and Japan have shown that Malaysian Rail network system are at its infant with a promising growth. 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. Even though currently, other cities in Malaysia have not embark on its urban rail transit network projects but, the improvement to intercity networks such as turning existing single rail system to double tracking system will escalate the transformation of Malaysian rail transit services. Integrating of rail transit system has been successful in developed countries and Malaysia has the great potential to emulate and further enhance its rail services, thus creating a rapid and sustainable transportation system for the people and development of the nation.

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