European Proceedings of
Social and Behavioural Sciences
EpSBS

www.europeanproceedings.com
e-ISSN: 2357-1330

DOI: 10.15405/epsbs.2024.05.38

INCOMAR 2023
The 9th International Conference on Marketing and Retailing

EVALUATION OF KUALA LUMPUR-SINGAPORE HIGH-SPEED RAIL PROJECT

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Abstract

The main purpose of this research is to analyse the effectiveness of the Kuala Lumpur-Singapore high-speed rail (HSR) implementation, particularly during the post-pandemic situation. To achieve that, this research will first determine the passenger movement trend from Kuala Lumpur (KL) to Singapore from all modes of transportation. This paper also intends to provide an understanding of factors affecting travel demand using Political, Economy, Social, Technological, Environmental and Legal (PESTEL) between these two countries. A quantitative method using secondary data was employed to achieve the research objectives. Data were then analysed using multiple linear regression analysis to determine the relationship between passenger movement and factors affecting travel demand. Results revealed that there is a growth in passenger movement and demand from KL to Singapore. The result has also shown a positive relationship between passenger movement and factors affecting travel demand from KL to Singapore. This study might be beneficial to various stakeholders who wish to advance more thought and knowledge on the impact of this HSR implementation. The study also will be valuable for the government representative, given the strengthening trade relationships between Singapore and Malaysia.

Keywords: High-speed rail, travel demand, passenger movement, Kuala Lumpur, Singapore

https://doi.org/10.15405/epsbs.2024.05.38
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Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

High-Speed Rail (HSR) is an innovation of traditional rail transport which operates using an integrated system and also electric services. It is also known as high-performance rail which can travel faster than existing traditional rail. In comparison to traditional rail services, it is able to significantly shorten the trip time (Doomernik, 2015). Japan started HSR back in 1964 (Celikkol-Kocak et al., 2017). Since the implementation, there has been a considerable change in the daily growth in the number of intercity travellers. Subsequently, allowing Japan HSR railway to repay its loans within seven years. After that, local trains were cross-subsidized using operating revenue from the line. The conditions of production and distribution brought about by globalisation, European integration, and the liberalisation of transport markets have caused businesses to fundamentally alter their logistics strategies (Tan et al., 2018).

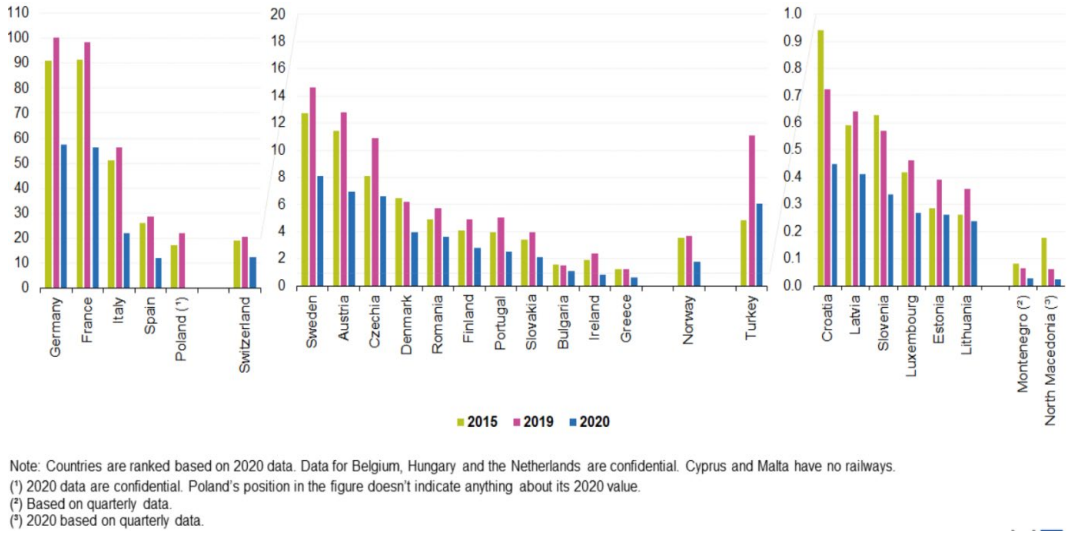

Figure 1. Rail passenger transport in 2015, 2019 and 2020. Source: Eurostat (2021)

As shown in Figure 1, the passenger rail market is higher in Germany followed by France and other countries. This shows that there is significant demand from particular countries. Rail service is the first choice for passengers who travel across border countries in Europe (Figure 2). This is because Europe and Western Europe are benchmarking their prestige rail operators (Bateman, 2021). As Europe is a world leader in HSR implementation, this is where Malaysia and Singapore took this idea too. Additionally, according to Desmaris and Croccolo (2018), the HSR project in Italy has produced a triple competitive effect which includes more capacity, more frequency and connections, lower prices and better services for high consumer benefits.

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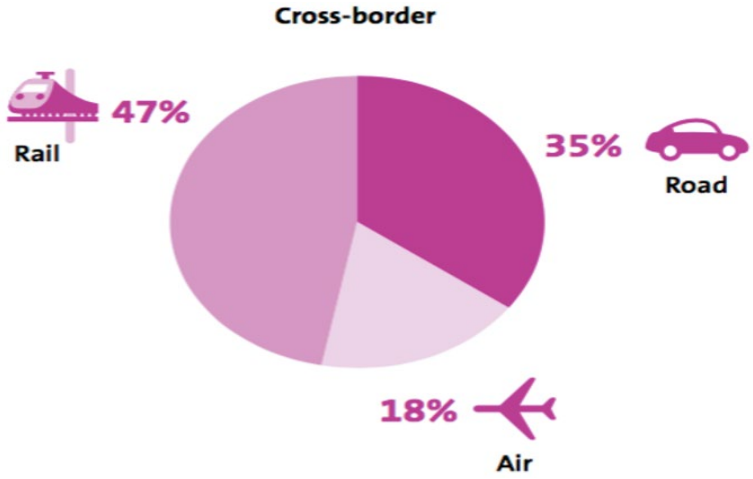

Figure 2. Rail transport usage. Source: Statista (2022)

1.1. Malaysia and Singapore HSR Project

Back in 1963, Malaysia and Singapore were formally a single entity and they share the experience of British Colonisation. Malaysia and Singapore shared the same similarity in their multi-ethnic demography and culture. The development of the KL-Singapore HSR project has been agreed upon by both countries and was planned to start its operation by early 2020 (Tan et al., 2018). It has been planned and signed by the previous Prime Minister Najib Razak and Singapore's Prime Minister Lee Hsien Loong. The agreement has taken place in Singapore. The length of the route will be around 350 km with 90 minutes of travel time. The project will require the construction of a brand-new line with dedicated tracks, which will allow trains to travel at least 270 km/h (Hutchinson, 2016). The project will be managed by Malaysia HSR Corporation within Malaysia, whereas Land Transport Association (LTA) is the Singapore government that will be in charge of the corridor in Singapore.

1.2. Malaysia Railway Services Overview

The KL-Singapore HSR project idea was started through the Economic Transformation Programme. The main purpose is to transform the country into a nation with a high-income country (Abd Aziz et al., 2018). It is set to be an alternative mode of transport between two of Southeast Asia's rapidly growing economies and vibrant countries. At the same time, the improved connectivity between the countries can lead to a high standard of living in both economies. A significant enhancement in connectivity with the expected completion of KL-Singapore HSR in 2026 will make border-crossing logistics less tedious and, hence, attract more cross-border shoppers from Singapore (Tan et al., 2018). The railway will include 7 stops which are Bandar Malaysia Station, Sepang-Putrajaya Station, Seremban Station, Melaka Station, Muar Station, Batu Pahat Station and lastly Iskandar Puteri before finally reaching its final destination in Singapore, which is Jurong East (MyHSR, 2018). This should supposedly increase business productivity and access a wider marketplace with an improved experience for travellers due to its short travel time.

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The initiative of this implementation is to reduce the travel time from KL to Singapore. The travel time between these two cities is expected to be cut short to around 2 hours compared to other modes of transport, which is 4 to 5 hours by road, 7 hours by the conventional rail services and roughly 3 hours by air including the travel time to and from the airport. Furthermore, the HSR project would bring socioeconomic benefits to both countries (Xue & Xiang, 2020). With the implementation of HSR, there is an economic benefit of RM650 billion in Gross National Income (GNI) by the year 2069 (Abd Aziz et al., 2018).

1.3. Passenger Movement from KL to Singapore

There are two types of passenger characteristics. First, a passenger who travels for business purposes and second, those who travel for tourism, personal, or religious reasons. Business passengers are more demanding and have experience in travelling. They are usually the ones who have more experience in travelling because they travel frequently (Celikkol-Kocak et al., 2017). These types of passengers are usually demanding since they pay more and travel by airline. The second type of passengers includes those who are in higher numbers but less experienced. These passengers are familiar with airline procedures and are concerned with services and concessions (Dixit & Jakhar, 2021). It also goes to those travellers who prefer to travel by road because they are familiar and more comfortable with the less procedure. On top of that, the passengers who spend leisure time usually have less demand for services.

Passenger movement from KL to Singapore is around 615,000 in 2021 and the numbers are projected to increase in the coming years. HSR was designed with a capacity of 100 million passengers per kilometre per annum (The Star, 2018). The low utilisation of HSR will lead to the wastage of facilities and wastage of funds. This case study needs to analyse the potential benefits to maximise the utilisation of HSR implementation which can contribute to economic well-being (Abd Aziz et al., 2018).

1.4. HSR Implementation Issue

Travelling at a higher speed than conventional rail services, the HSR system can be a competitive alternative to existing air and road transport for medium-distance intercity travel. The main issue here is that the implementation of the HSR construction from KL to Singapore can also affect air transportation as well (Tan et al., 2018). It can create a lot of competition from other modes of transportation, which reduces its market share and this led to gaining reputation and popularity among other modes of transport. HSR implementation can bring a lot of benefits in terms of reduced travel times, more choices of mode of transportation from origin to destination and also job opportunities for Malaysians. Nevertheless, the high cost of building and operating these infrastructures, in the midst of the economic crisis, has called into question the advisability of these projects (Zainal & Mohamad, 2013).

In terms of the level of services, it depends on the passenger's choice. According to Wang et al. (2018), different levels of service attributes impose different impacts on the utility function. The value of minor time differs between various modes and also differs between various travel purposes. The connection time between the HSR network and the aircraft network is highly valued by passengers. Delay protection is more welcomed by passengers who are less familiar with the transfer city (Brathwaite & Walker, 2018). Additionally, the benefit of an integrated ticketing system is perceived ambiguously

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whereas an integrated luggage handling system shows attractiveness to passengers, especially those who travel with more than one piece of check-in luggage. On the other hand, high tourists between both countries can impact the HSR project from KL to Singapore. Based on the aforementioned concept, if the accessibility to a country is easier, more tourists will visit and stay in that country.

HSR is a relatively new mode of transportation and represents a contemporary revolution in transportation technology, which has been promoted only in some countries around the world (Aschauer et al., 2015). Table 1 shows the fare price comparison between HSR from other countries and the fare of aircraft. This shows the price is a little extra charge of 30 dollars when the passenger uses aircraft fare. However, the time consumed will be much shorter than going by aircraft.

Table 1. Fare comparison between HSR and aircrafts (Amount in USD)

Airline	HSR	Aircraft
Japan (Tokyo-Osaka)	100	100
France (Paris-Lyon)	100	130
Korea (Seoul-Busan)	100	130

Source: Prussi and Lonza (2018)

In terms of politics, the HSR project construction should be started in 2018 but the new government has postponed it because it does not bring benefits to the country. Due to that, the former prime minister, Tun Dr Mahathir announced that the HSR project would be scrapped entirely (Hassan, 2018). However, after a discussion with the neighbouring country, the HSR projects were planned to be completed in 2025 and full operations are expected to start in 2026 (MyHSR, 2018). This is because the new government is trying to settle down other debts by the previous government and at the same time to make sure that economic finance is stable. Many studies have looked at the effects of HSR implementation KL-Singapore (Tan et al., 2018). Numerous researchers have studied how the HSR implementation brings good economic impact between two countries. However, there has not been a lot of attention given to the relationship between passenger movement and travel demand, particularly factors affecting demand between KL and Singapore. Hence, it is very important to evaluate these two aspects so that the authors can see whether there is any correlation between these two aspects with the implementation of HSR.

To help authors to concentrate on the research objectives and to gain comprehensive knowledge about the issue, the following interrogations are important. To begin with, the researcher will find out what are the trends of passenger movement from KL to Singapore over the 5 past years and identify factors affecting the demand for HSR construction. The research objective will guide the research direction and data procedures, and specify a research design. The primary objectives of the research are to (i) identify the operational status from KL to Singapore and, (ii) to identify the proposal for KL-Singapore HSR implementation.

This current study will continue with a comprehensive literature review, the development of a theoretical foundation, and identifying the possible variables. The latter will include analysis of secondary data, and reporting the findings. The study will conclude with a discussion, conclusion and recommendation.

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2. Literature Review

2.1. Evaluations and Capacity

Evaluation is the systematic assessment of the design, implementation or results of an initiative for learning or decision-making. It determines the value of learning and training programs and acts as a blueprint for judgement and improvement (Adnan & Ritzhaupt, 2018). A capacity is defined as a maximum average flow that a facility can accommodate over a time period long enough to include a large count (say 100 or more) and which could, in principle, be sustained for an infinitely long time. The capacity means the maximum average flow that the facility can accommodate enough to include a large count over a long period. In planning, the aim should be to ensure that capacity satisfies demand within practical economic limits and to provide a capability for increasing capacity as demand increases with traffic growth. As the traffic passenger growth keeps increasing, capacity planning must be able to cater to that growth capacity and planning must design for it (Broman et al., 2022).

2.2. Development of HSR

In recent years, HSR networks have been developed rapidly and at a large scale in China. China started this development towards making China an urban city in economies more consumer-oriented. When there was this HSR in China, it increased commercial and business districts surrounding that area. HSR has been a focal element of transport policies in many countries while pursuing various goals: alleviating congestion on the conventional rail, road or air networks, accelerating economic development and integration, as well as reducing the environmental impact of the transport industry (Su et al., 2019). Based on the International Union of Railways, HSR systems carried over 420 thousand passenger km in the year 2018, and the numbers keep increasing. This shows that there is a demand for HSR systems in China. The speed and scale with which HSR infrastructures are expanding in China far exceed those elsewhere around the world (Chen et al., 2018).

2.3. Macro Perspective through PESTEL Tools

Politics is the extent to which government and government policy may impact an organisation or a specific industry. This would include political policy and stability as well as trade, fiscal and taxation policies. Additionally, government regulations and legal factors are assessed in terms of their ability to affect the business environment and trade markets. Every project has both internal and external politics. Internal politics includes team jealousies, cohesive projects, and personal interests that occur in all projects and must be considered and managed by stakeholders (de Sousa & Castañeda-Ayarza, 2022). External politics refers to those, which the stakeholders can’t control such as unemployment laws, tax policies, trade restrictions, trade reforms, environmental regulations, political stability, and tariffs are the political events.

Through the economy, businesses examine the economic issues that are bound to have an impact on the company. This would include factors like inflation, interest rates, economic growth, the unemployment rate and policies, and the business cycle followed in the country (Zahari & Romli, 2019).

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These factors impact the economy and its performance, which in turn directly impacts the organisation and its profitability. Factors include interest rates, employment or unemployment rates, raw material costs and foreign exchange rates. Meanwhile, the social focus is on the social environment and identifying emerging trends. This helps a marketer to further understand their customers' needs and wants. Factors include changing family demographics, education levels, cultural trends, attitude changes and changes in lifestyles. The sociological factor takes into consideration all events that affect the market and community socially. These events include cultural expectations, norms, population dynamics, healthy consciousness, career altitudes, global warming, and a few others (de Sousa & Castañeda-Ayarza, 2022).

Social indicators like exchange rates, GDP and inflation are critical to management. Some social factors that are usually focused on in population demographics are the distribution of wealth, changes in lifestyles and trends, and lastly educational levels (Zahari & Romli, 2019). The researcher will only use political, economic and social factors to evaluate the implementation of HSR from KL to Singapore. This is because these three aspects are related to the findings' variable needs. Whereby, the other two, which are technologies and legal, are not related to the research findings for this case study.

According to Brathwaite and Walker (2018), travel demand models are used to aid in the evaluation of alternative policies. By evaluating travel demand, the researcher can predict the consequences of the construction of HSR implementation from KL to Singapore. However, the degree of sensitivity (demand elasticity) will vary according to different situations. Demand elasticity is essential to reliably estimate in order to ensure that rail transport policies are effective. The travel demand can be defined as during a given time period, a person wishing to travel from origin to destination that starts their trip at A and finishes at B. Therefore, this study adopted the PESTEL tools to develop a research model to study the trend of passenger movements as shown in Figure 3.

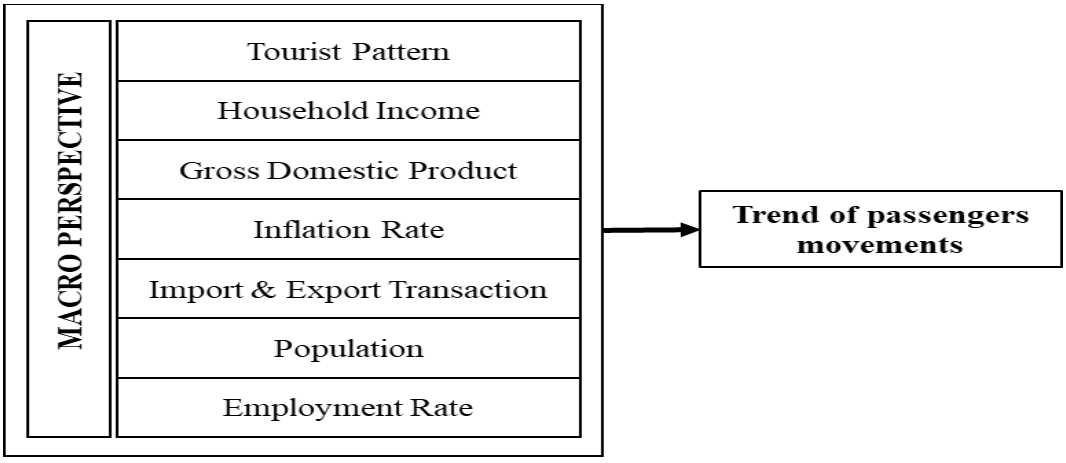

Figure 3. Factors affecting demand

3. Methodology

The main methodology used is by using secondary data. This is because secondary data are the data collected by another party for its other purposes at a different time in the past. As the researcher used this data for the current research, it becomes secondary data. It can be written, typed or in terms of electronic forms. The researcher will gather a variety of secondary information sources that are available.

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With secondary data, the researcher also can gain initial insight into the research problem. It can be an internal and external factor where research is being carried out. The data collection stage will use the 5W1H which are what, when, where, who, why and how. This will be used for every research objective. The reason for using this 5W1H is to systematically study a new research topic, which can provide insights as well as practical guides to other researchers, which plan to conduct an unfamiliar topic (Jia et al., 2016). These 6 keywords are to represent the needs of what people want to know about a new story. To report the findings, the authors need to be supplied with very essential information on the six questions as summaries in Table 2 and Table 3.

Table 2. Data collection procedure for research objective 1

Questions	Objectives
What	A study on the passenger movements from Kuala Lumpur to Singapore trends over the 5 years duration (2013-2017)
Where	Rail transportation service provider
Why	To know the passenger's movements trends over 5 years
How	Using secondary data

Table 3. Data collection procedure for research objective 2

Questions	Objectives
When	Factors affecting the travel demand from the year of 2012-2016
Where	Travel demand from Kuala Lumpur to Singapore
What	▪ The factors that affect travel demand ▪ The potential benefit of HSR Kuala Lumpur- Singapore
How	▪ Using secondary data reading and external and internal factors ▪ Using multilinear regression software

Logispreneurs bring resources to the industry, from their knowledge and experience to the capital they invest. Their investments create jobs and expand the labour force, helping to inject money into the local economy. Logispreneurs are also eager to experiment with new technologies, such as blockchain and the Internet of Things, which have the potential to revolutionise the industry and bring down operational costs. This can help Malaysia to remain competitive, while also streamlining logistics processes and fortifying data security (Muhammad et al., 2023).

3.1. Multiple Linear Regression

In the researcher's work, there is only one type of calculation to determine objective 2. It is multiple linear regressions. The researcher used multiple linear regression software to examine the correlation between the factors affecting demand and passenger movement from KL to Singapore (Fumo & Biswas, 2015). The reason why the researcher chooses this method is that the researcher is doing content analysis. By using this method, the researcher can assume that there is a relationship between the independent variables and the dependent variable. Secondly, it enables us to make a prediction based on several predictors. Last but not least, it can help the researcher explain the interrelationships among the variables.

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4. Findings

The case study is based on data collected from the passenger's movement from KL to Singapore by using rail transport. The data was collected from 2013 to 2017 from the annual report provided by the Keretapi Tanah Melayu Railway Station. On top of that, data on factors affecting the demand is also collected based on the department statistics of Malaysia and also from all various organisations.

4.1. Passenger Movement from KL to Singapore

Figure 4 shows passenger movement for the previous five years starting from 2013 until 2017. In 2013, the number of passenger movements were 1,563 and increased to 1,692 in 2014. This is due to the economic growth in 2013. During this year, Gross Domestic Product (GDP) has increased by 5.1%. The passenger movement keeps increasing to 2,059 in 2015. According to The Star (2018), the economy grew by 5% in the year 2015. So, this shows that the household income might increase and most of them travel by using electric train service. In 2016, the passenger movement increased to 3,565. Based on Malaysia's tourism statistics, Malaysia welcomed a total of 25.7 million tourists. In 2017, passenger movements increased to 4,148 due to the tourist arrival in Malaysia (Malaysia.Travel, 2021). Most tourists who want to travel domestically prefer to use electric train service as their mode of transport. That is why the passenger movement keeps increasing year by year.

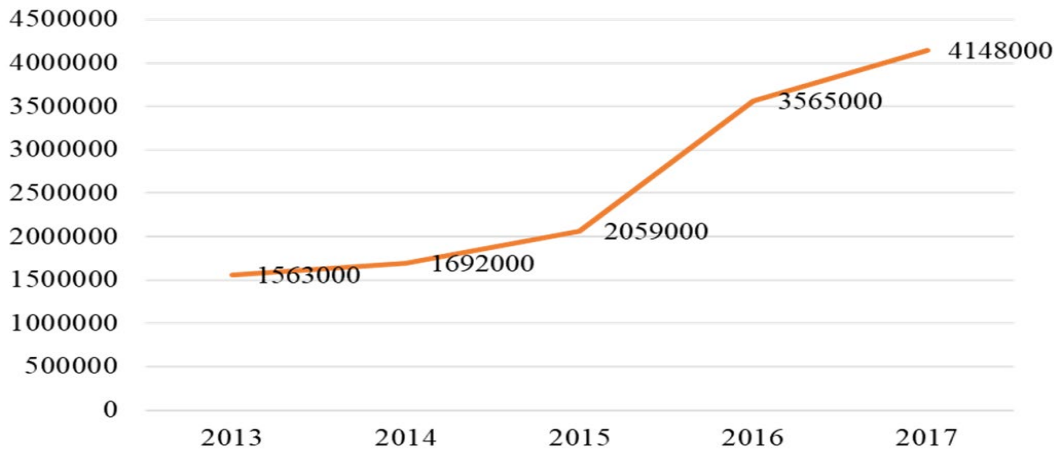

Figure 4. Passengers' movement from KL to Singapore. Source: KTMB (2022)

4.2. Passengers' Movement by Existing Transportation from KL to Singapore

The trend of passenger movement from KL to Singapore is increasing over the years (Figure 5). This shows that the passenger per kilometre of travel is strong between these two routes and it can be seen when the total travel market grew from 5.47 million passengers per kilometre in 2005 to 7.45 million passengers per kilometre in 2011. In this matter, demand for the causeway between the two bridges that connect Johor Bahru and Singapore has exceeded 33%. However, KL-Singapore trips are expected to grow at a very comparable rate to the GDP of Malaysia and Singapore, which is 3% to 5%, on average. As the market matures in the long run, the growth rate might be slower. Nevertheless, the average growth

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is expected to be around 3.2% from 2010 to 2011 with a market of 251 million passenger trips by 2060 (CAPPA, 2013). Hence, with the passenger demand results, HSR would add another option to meet increasing demand.

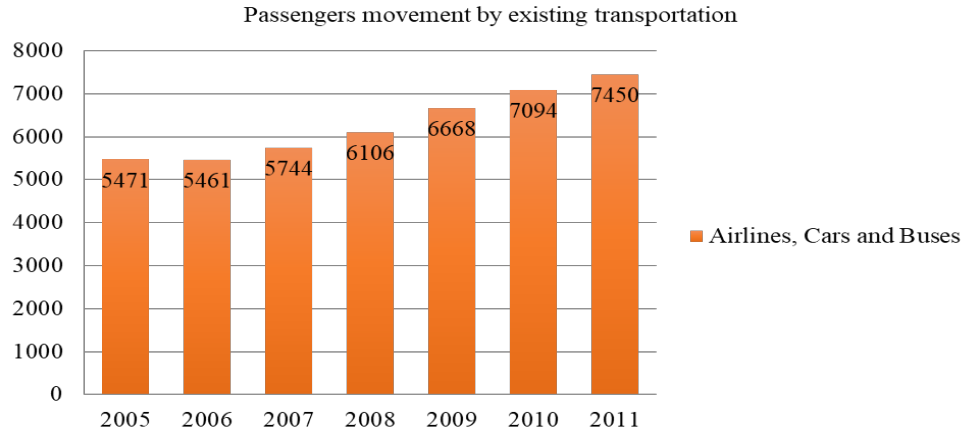

Figure 5. Base transport demand in HSR corridor for relevant routes. Source: CAPPA (2013)

4.3. Passengers' Movement Using Air Transportation from KL to Singapore

As shown in Figure 6, Singapore has the highest seat capacity in a month at 101,248. Followed by Jakarta, which is 58,934. The third-ranking is Hong Kong, where the seating capacity is 33,092. Bangkok's seat capacity is almost the same as Hong Kong's. However, the total seat capacity occupied was 32,688 it is now in fourth-ranking. Don Mueang International Airport which is located in Thailand, Bangkok is in the fifth ranking with 22,680 seats. Whereas, Saigon is in sixth ranking by 22,204 and has a little bit similar value with Denpasar by 21,204. Dubai has the third lowest with 19,465. Melbourne with 18,536 is in seventh ranking and followed by the last one which is Hong Kong with 18,498. In conclusion, Singapore is the busiest route from KL to Singapore, which makes the passenger movement through the seating capacity occupied, is also high.

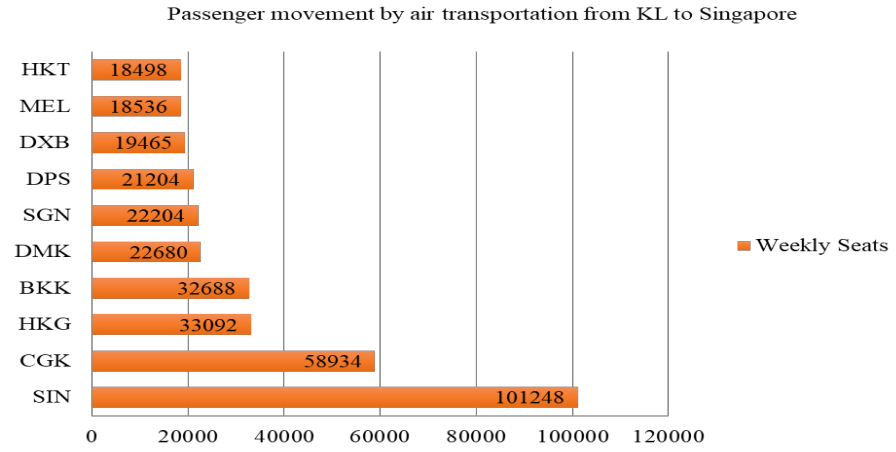

Figure 6. KLIA top 10 destinations based on weekly capacity, Source: CAPPA (2013)

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4.4. Factors Affecting Passenger Travel Demand from KL to Singapore

Table 4 shows that there is a correlation between the factors affecting travel demand and the number of passengers. However, the highest correlation is the GDP, which is 89.33%. The number of exports correlates with the number of passengers from KL to Singapore, which is 71.46%. The third highest number of imports, which is 69.88%, was not correlated with the movement of passengers from KL to Singapore. Other factors which are population, number of employment, household income, number of tourists, unemployment and inflation rate do not indirectly correlate to the passenger movement from KL to Singapore from the year 2013 to 2017.

Table 4. Arrangement factors affecting passenger movement

Factors Affecting Air Travel Demand	Variation of Correlation (%)
GDP + Number of Export +Number of Imports	230.67
GDP	89.33
Number of Export	71.46
Number of Import	69.88
Population	67.75
Number of Employment	61.24
Household Income	58.02
Number of Tourist	57.66
Number of Unemployment	25.59
Inflation Rate	19.71

Source: CAPPA (2013)

4.5. Discussion

The findings showed that the highest number of passenger movements is 4,148 thousand which is in the year 2017. This is because the GDP, the number of exports and imports is high during that year. So, it can be said that passenger movements from KL to Singapore are high for the previous five years. Secondly, referring to the HSR utilisation, the design capacity is 100 million passengers per kilometre. But in 2017, the utilisation usage was only 4,148 passengers per annum which is 4% utilisation in terms of passenger throughput. In short, the utilisation is low. So, it can be said that the electric train service is underutilised.

The result from the multiple linear regression analysis above shows the factors affecting travel demand which correlate with the number of passengers from KL to Singapore are the GDP which is 89.33%. By having high GDP, people of the state would travel as they got money. The combination of GDP, the number of exports and number of imports show a correlation which is 99.36%. Besides that, there are other factors that can be said to be near to the number of passengers from KL to Singapore. Such factors are population which R-Square is 67.75% and employment rate which R-Square is 61.24%. In conclusion, the highest factors affecting air travel demand that contributes to the number of passengers from KL to Singapore is the GDP and the factors affecting air travel demand that is almost near to the correlation with the number of passengers are population and employment rate.

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5. Conclusion and Recommendations

5.1. Research Implication

The current paper contributes to the literature in two different aspects. Firstly, it provides more evidence of the passenger's movement from KL to Singapore in the context of passengers using rail transportation. This could deepen in understanding that there is a demand for travel from KL to Singapore that is the driving factor behind passenger's mode choice and preferences. Secondly, this study extends the researcher seeking on the factors affecting the travel demand from KL to Singapore. This is to assist and determine whether there is a potential benefit to implementing the HSR from KL to Singapore. Our results show that there is passenger movement from KL to Singapore by using all (rail, road and air) type modes of transportation except sea transport. Moreover, the GDP is correlated to passenger movement from KL to Singapore. This is due to the number of exports and imports also correlated to passenger movement from KL to Singapore. Alike, the tourism plan in Malacca is also another reason for the passenger movement from KL to Singapore. It is also in line with the industrial plan in Malacca and is another factor in passenger movement from KL to Singapore. Thus, another mode of transportation available from KL to Singapore could be a competitive mode of transportation when there is an implementation of HSR.

5.2. Limitations of the study and future research directions

To carry out the research study the following limitations were expected and faced during the research study. First, the availability of secondary data from the annual report of the companies was difficult. Second, the data shared is only from 2013-2017 due to government changes in 2018 and due to covid-19 pandemic in the following year. Furthermore, the management may not like to share their views on the topic. Lastly, time, cost and location factors become major difficulties in the completion of the research. Nevertheless, to overcome the limitations and maintain the effectiveness of the research work sincere efforts were put in.

This work makes some key contributions to all the stakeholders and government in ensuring by developing the HSR implementation can contribute a potentially beneficial impact to the country, which is Malaysia. With the current existing rail transportation, passenger movement throughout the year is underutilised. The researcher examines the passenger movement trend from KL to Singapore from the year 2013-2017 by using all modes of transportation. The main purpose is to identify whether there is a passenger demand from KL to Singapore. As a result, there is a demand from KL to Singapore. The implementation of HSR can be more consistent and reliable in the future as there is a demand between these two destinations. The researcher also demonstrated the factor affecting the travel demand from KL to Singapore from the year 2013-2017. From the analysis, it shows the highest contribution factor that correlates is GDP, the number of exports and imports. So, here the researcher believes, the main reason these three are the highest is due to the industrial business trade and people not travelling for leisure purposes. The researcher also believes it is better if the government and all the stakeholders implement

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eISSN: 2357-1330

the HSR in the east coast area all the way to Thailand. This is because people would prefer to travel to Thailand due to factors affecting travel demand and the main purpose of travel is leisure.

Therefore, the researcher's study can serve as a basis for future research in this area through the theoretical development made as a measurement by using multiple linear regression software. The researcher's findings show a relationship among the aspects or elements of factors affecting travel demand value to the decision-makers and logistics practitioners. This is because the findings showed the journey towards the implementation of HSR success by measuring all the elements to achieve potential benefits.

6. Conclusion

The first objective is to analyse the passenger movement trend from KL to Singapore from the year 2013 to 2017. Based on the study, the movement of passengers from KL to Singapore service is low. The design capacity of HSR is 100 million passengers per kilometre, but from the year 2013 until 2017, HSR design capacity utilisation is still under its design capacity and not exceeding it. From the research, the current status is underutilised. If the MOT doesn't increase the number of trains per trip, the utilisation will keep low.

Next, the second objective is to examine factors affecting passenger travel demand from KL to Singapore. This objective also was carried out to evaluate whether HSR is reasonable to be implemented or not based on the trend of passenger movements and the travel demand from KL to Singapore. From the research, the main factors that affect the number of passengers are GDP itself. So, the state government needs to look at this factor in order to increase the number of passenger movements such as increasing the employment rate in KL and ensuring the employment rate is higher than the unemployment rate. There are also potential factors that can closely affect the number of passengers besides the high population. Thus, passenger movements and factors that affect the number of passengers from KL to Singapore show that the implementation of HSR should be implemented. This is because tourism does not affect the travel demand and tourists might use other modes of transportation for travel to and from KL including by bus, and aircraft. Second, based on KL household income and inflation rate, it shows people tend to travel by another mode of transportation that is cheaper and more affordable as the income is low and increases in the inflation rate. Additionally, KL people will not travel by air transport because they cannot afford it and they choose to use other modes of transportation to travel (Wahab et al., 2018).

To increase the utilisation rate in the future, in terms of high movements of passengers, some recommendations can be done as discussed below. Firstly, the state government of KL must have the initiative to increase domestic routes from and to KL stations. The current domestic routes frequently are only to the South. Government can focus on and increase domestic routes to the North since external factors like the population, employment rate and household income do not affect the travel demand. Second, the government should increase the number of trains operating from and to KL. There were only seven-stop stations, which is available for the domestic route. The Melaka state government has plans, for example, the Melaka Gateway project, medical project, trade project and tourism project with another country. Thus, it is an opportunity for the state government to increase the number of trains for the potential of a business project there. The increase in business will attract more people to travel and leisure travellers usually travel by train because of time considerations and it is cheaper compared to air

transport. With numerous trains operating in KL, it can serve the passenger demand with various chosen routes there. This will help to increase the percentage of HSR utilisation in the future.

Next, to increase the number of passengers using HSR, the KL state government should increase the employment rate at KL. The current total number of employees in 2017 is 840,900 and the number of unemployed is 30,900. The analysis shows that the employment rate does not correlate with the number of passengers. Thus, the state government should plan to increase the employment rate in KL, hence, it will increase the number of people travelling which led to an increase in HSR utilisation. Additionally, the KL state government should see the potential of the combination of GDP, the number of exports and imports. With the increase in numbers of the population of KL in the year 2017 which is around 3,202,000 thousand, there is a need to keep increasing KL's GDP. The state government needs to employ more people to work in KL itself to increase the opportunity for people to use HSR services. It is hoped will enable an increase in the number of passengers in KL station and subsequently increase the utilisation of HSR in the future.

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https://doi.org/10.15405/epsbs.2024.05.38
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Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

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