Relationship Between Timeliness and Intention to Use of MRT Services in Klang Valley Malaysia

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Abstract
The increasing fatality report of road accident in Malaysia is alarming over the last 10 years. The significant increase of private transportation possession especially in Selangor and Kuala Lumpur proven the significant relationship with the increase of road accidents between 2009 and 2018. Many programs have been carried out to address concerns on increasing traffic accidents under massive national plans throughout the nation. National Key Economic Area under a program called National Transport Policy, MRT project was introduced to strengthen the continuous effort for public transport sustainability. Nevertheless, since the launch of MRT until today, average ridership has not reached its target. Lack of research on the behavioral intention particularly towards the utilization of MRT in Malaysia provide an opportunity to empirically explore this in Malaysian context. The focus of this research was to determine the relationship between independent variable (timeliness) towards dependent variable (intention to use). Five hundred (500) questionnaires were distributed at selected MRT station around Kuala Lumpur and Selangor. Respondent was frequent user of MRT service and those commute on daily basis. Data were analyzed using SPSS version. Findings indicated that result for direct effect revealed significant in relationship between timeliness with intention to use thus hypothesis is accepted. The results proofed MRT service play important role as part of the transportation channel towards the target group with the direct impact contribution of timeliness as determinant factors of preference.

Keywords: MRT Services, Intention to Use, Timeliness, Behavioral study.

Introduction
Public transport describe as transportation means which are provided by the government to the public citizen, involve such as bus, subway, taxi, train, ferry as well as railways (Yusoff et al; 2019). The Ministry of Transport in Malaysia was established in 1956 with a few changes in the division's name until finally The Ministry of Transport was renamed in 1978 and remains till today. This Ministry is responsible for road transport, civil aviation, marine, road safety, port authority, railway assets, maritime, air accident investigation, logistic, maritime safety, shipping, rail transport, airport, airline. It is also responsible for planning and imposing policies on land, air and sea transport in order to ensure and secure, healthy and effective transport system in the country.

The Ministry has also carried measures to reduce the traffic accidents and fatalities in line with the demands of United Nations Sustainable Development Goals. The Malaysian Road Safety Plan (Pelan Keselamatan Jalan Raya Malaysia) 2014–2020 was launched in November 2014 by the Ministry of Transport Malaysia to reduce fatalities due to road accidents. Many programs have been carried out to address concerns on increasing traffic accidents under massive national plans like this throughout the nation. Nevertheless, most programs or campaigns are either corrective or preventive measures which apparently goes back to re-utilize private vehicle without re-considering other alternative and safer mode of transportation.

The concept of establishing this study derives from the chronology of the transportation scenario mentioned especially with the overgrowing concern of private vehicle ownership which increases year by year despite the constant effort to attract public to utilize public transportation in travelers' logistic routine. Malaysia faced a tremendous increment of 70% and 55% in total registered cars and motorcycle respectively from 2008 to 2017 and ranked 7th highest registered motorcycles in the world totaled 8.4 million (Ubaidillah; 2020).

MRT is taken as the study for many reasons. Taipei MRT has addressed the persistent traffic crisis since 1997 by boosting traffic patterns, revitalizing the city, and encouraging the regeneration of inner cities and satellite cities (Hsuang and Tsung; 2009). In Dubai, Mass Rapid Transit (MRT) systems are planned to carry huge quantities of passengers, thus solving the issues of congestion and the climate in large metropolitan areas (Parahoo et al; 2014). Regionally, Tuan (2015) suggested that to accommodate increased travel demand, Asian cities could invest in MRT project development and help deal with motorcycle dominance issues in the long run, as it would entice a significant number of motorists and motorcyclists.

As for the local reasons, the integration of the Kuala Lumpur MRT system would enhance the level of sustainable transport in the region (Kwan et al; 2015); effective implementation of MRT will help metropolitan cities by reducing congestion and carbon emissions (Van Dut; 2017); and the features of the MRT trips suggest a chance to replace private trips vehicle trips in the area with train travel (Kwan et al; 2018).

The focus here is to find factors that lead to the intention to utilize KVMRT Sungai Buloh – Kajang (SBK). "Intention to Use or Utilize" refers to factors affecting private motorcycles and motorcars' behavioral intentions toward utilizing MRT services. Ibrahim et al (2020) determined users' intention to use through the extended Theory of Planned Behaviour. Shaharuddin et al (2018) studied behavioral intention to passengers' motivation to use LRT through the application of Theory of Reasoned Action (TRA). This study explored the behavioral intention to use MRT from the perspective of the current motorists by applying the selected the variables of services, accessibilities, time, and costs with policy intervention as hypothetically a push moderating factor. One of the factors related to intention to use is the time factor. Timeliness refers to the time expectation for the availability of MRT services can be measured through interval between when is expected and when it is ready or available to utilize. Ab Majid et al (2020) investigated how time attributes effect public's deliberation to the utilization of Mass Rapid Transport (MRT) system in Malaysia. Travel time and delay Marcelo and Virgil (2020) adopted travel time and delay as a factor to determine the passenger choice upon introducing MRT in Manila. Abdulrazzaq et al (2020) proved that the travel time and distance travelled are significant factors to increase the use of public buses and reduce car dependency.

Literature Review

2.1 Railway and MRT Services

Railway services, which was developed as private owned public utility, serving the dual purpose of earning a profit as well as providing services to the society. Schaffner (2017) stated that effective transportation networks that incorporate public transit make cities more livable by easing commute and transportation needs and increasing accessibility. We have seen an upgrade on major rails and links with new laws being passed where options are available to look for other modes beside private transportation (refer table below). The development of the railways in Malaysia has changed from time to time to improve the quality of public transport in urban areas, particularly for public users in Klang Valley (Yusoff; 2019). The rapid development of railway technology contributed to the numbers of passenger for rail transport services in Malaysia from 2009 to 2018 stated below.

RAIL SERVICES	2011	2012	2013	2014	2015	2016	2017	2018
Laluan Kelana Jaya	68,398,561	71,574,675	78,702,931	81,971,322	82,144,674	79,002,829	83,585,412	87,216,597
Laluan Ampang	53,568,672	56,809,978	60,207,397	63,270,432	62,809,412	59,192,907	59,462,032	60,960,445
Laluan MRT SBK	n/a	n/a	n/a	n/a	n/a	n/a	22,350,508	51,314,240
KL Monorail	24,200,299	24,435,931	25,437,621	24,303,465	25,067,866	21,990,242	16,841,630	12,594,377
KLIA Ekspress	1,581,476	1,649,410	2,063,419	2,928,302	3,470,710	2,419,883	2,275,650	2,195,353
KLIA Transit	3,238,389	3,713,536	4,374,219	6,310,323	6,496,617	6,485,272	6,443,667	6,540,177
All KL Commuters	35,599	34,847	43,942	46,957	49,690	41,469	37,274	32,078

Source: Ministry of Transport Malaysia, Transport Statistics of Malaysia, Putrajaya, 2019, p30

To summarize, the Malaysian transportation scenario gives a brief picture of the reason for this study. Focus will be on Selangor and Kuala Lumpur motorists and motorcyclist users, being the two highest contributors of accident and fatalities as well as the availability of the MRT stations in these two states.

2.2. Intention to Use

Intention to use or utilize is related to behavioral intention. It is a major subjective likelihood that a person has a probable indulge in each behavior (Borhan et al; 2019). The intention as a dependent variable represents the extent a person will execute conscious effort in performing any intended behavioral action as the component of motivation (Ngah et al; 2020). A central factor of the Theory of planned behavior is an individual's intention, which provides the most accurate prediction of a particular behavior (Ajzen; 1991).

Behavioral intention has been studied numerously towards transportation especially public transportation locally and overseas. It has been studied to predict the travel intention of car drivers in Libya regarding using the new low-cost carriers (LCC) by adding three constructs to the original TPB model. Borhan et al (2017) indicated that attitude towards LCC, perceived behavioral control (PBC) and subjective norm (SN) have positive effects on the behavioral intention of taking LCC. The findings of intention to use High Speed Railing (HSR) in Libya by Borhan et al (2019) was consistent with their above-mentioned study on the attitude, subjective norms, and perceived behavior.

Intention to use among them was studied to understand the trip characteristics of private and public transport users in Kuala Lumpur, and the intention of private motor vehicle users to use to rail transport if available. Kwan et al (2018) believed regression for the weekday trips showed that trip duration, distance, purpose, vehicle occupancy, and presence of child passengers were significantly associated with the intention to shift and use the public transportation. For weekend trips, only the trip duration and presence of child passengers were significantly associated with the intention to shift. Earlier studies by Redman et al (2013) supported this, stating that accessibility was one of the improvements that had been targeted for improvement strategies among them by providing weekend and evening PT services to the outer, lower-income suburbs. Febriani et al (2020) however opposed the idea of weekdays and weekend differences, stated that on both days, most of respondents have the intention to shift to MRT because of its faster, more comfortable, no traffic jam, more safe, cheaper, and other with the fact that those who were unwilling to shift to MRT was because of the distance to the nearest stations they preferred to use their current mode.

In short, the study related to intention to use has been carried out in various sectors and various behavioral intentions. Several behavioral frameworks have been introduced in the extension of underpinning theories especially TPB with the introduction of few new constructs.

2.3 Timeliness

Puteela et al (2021) referred timeliness, travel, or transit time to follow schedule as it is a crucial determinant among the significant factors influencing behavioral intention. Punctuality is one of the key elements in which delays needed to be remedied with the most effective value improvement strategies affecting travelers. De Ona et al (2016) referred timeliness in terms of punctuality, speed, and waiting time, but factors mostly influencing timeliness or time are linked to punctuality and speed. According to Nguyen et al (2019), as time and cost of a particular travel mode rise, the behavioral intention to utilized would decrease. If the attributes of cost, seat availability and total time were the same, the mode having shorter transiting time is more likely to be selected than the mode with longer transiting time (Nguyen et al; 2019). This showed the importance of time as a variable to behavioral intention. Surprisingly, according to Dirgayahani & Sutanto (2020) the time variable is not significant on their intention to use the LRT. Initial study by Kwan et al (2018) in the other hand highlighted that people accepted that rail transport could be an effective alternative transport to avoid traffic congestions and save travel time.

Time factor in this study correlates with transit schedules, transit time and duration, punctuality, speed of the trip and waiting time on the platform. Puteela et al (2021) stated that timeliness was related to travel or transit time to follow schedule which is a crucial determinant among the significant factors influencing behavioral intention. Transit time and duration refers to the time spent or consumed during the distance of the stations from trip origins or destination. People who consider travelling fast as the most important factor when using public transportation are more likely to use rail transit than buses since it was considered as a faster service than other public transport modes to go to their wanted places (Shaharuddin et al; 2018). Access to the railway system, transit time, and total time used for access and transit are important factors in its attractions (Yusoff et al; 2019). Ab Majid et al (2020) added that all of seven (7) attributes studied including transit schedules and waiting time for transit, indicated significant value towards current MRT ridership intention. In addition, Ibrahim et al (2019) also mentioned punctuality as one of the highest expectations from passengers. Wang et al (2020) stated that in China, punctuality was one of the most considered factors to use the railway.

Ab Majid et al (2020) investigated how time attributes influence the public's consideration to the use of Mass Rapid Transport (MRT) system in Malaysia. The results showed seven of time attribute has significance on timesaving among MRT's user and contribute to high impact level on MRT Ridership. However, earlier critique stated that for car users, access, reliability, and competitive costs must be provided by public transport services to meet that already offered by a private motor vehicle (Redman et al; 2013). Kwan et al (2018) also found that respondents had significantly higher intention to shift when the travel time increased, especially to above 36 min, but having children in the vehicle significantly reduced the respondents' intention to shift. On the weekday, the intention to shift increased with trip duration, suggesting that people accepted that rail transport could be an effective alternative transport to avoid traffic congestions and save travel time.

2.4 Operationalization of hypothesis

The conceptual relationship in this study is developed based on the previous literature in continuation to investigate further on this variable towards the intention to use of MRT. The basic argument of this study is that travelers may have the intention to use the MRT, which influenced by its timeliness factor towards the intention to use MRT and at the same time will have direct significance towards utilization intention of MRT.

Intention to use has been influenced mostly by the Theory of Planned Behavior (TPB) which positioned itself on behavioral intention. Zailani et al (2016), Borhan et al (2017), Nguyen et al (2018), Nguyen et al (2019), Jing et al (2019), Ngah et al (2020), Ab Majid et al (2020) and Ibrahim et al (2020) were among who studied behavioral intentions towards using several public transport-related vehicles through the behavioral theories of TPB. Even though there were few other theories

which had been incorporated like Theory of Reasoned Action, Technology Acceptance Model or even Socio-ecological model of behaviour in the study of Acheampong & Cugurullo (2019), Shaharudin et al (2018), Borhan et al (2019), TPB is still prominent in examining intention to use public transportation especially in MRT.

Based on the literature review this study primarily focused on an observed composite variable of intention to use that are influenced by the exogenous variable (Ab Majid et al, 2020), Timeliness was a priority for decisions to select mode of transportation as it was found to have a positive significant effect on the intention to use rail transport (Puteela et al, 2021; p.84). The amount of decreased travel time increased modal shift from car to public transport and vise-versa, the increased time from home to work commute increase the potential to use private cars (Kwan et al, 2018). Considering the reviewed literatures and theory underpinned this study hypothesized that:

H^1: Timeliness will have a direct correlation on MRT intention to use.

Research Methodology

As an endogenous variable, intention to use would have several dimensions initially adopted from previous studies especially the behavioral intention toward utilizing public transport vehicles. This paper will explore several dimensions of intention to use namely "Intention to Use MRT in General", "Intention to Use MRT for Work or Study" as well as "Intention to Use MRT for Recreational Purpose" as adopted from the combination of Kwan et al (2020), Hussein (2020) and Kwan et al (2018).

The study of timeliness has been carried out through various weights including as the determinant towards the intentions to use. In this paper, dimensions of timeliness are investigated through the "Number of Transit", "Punctuality", "Speed of the Trip" and "Waiting Time at the Platform". These are adapted from the study of Ab Majid et al (2020), De Ona et al (2016) and Weng et al (2018). Number of transits refers to the total number of available trains for MRT users; punctuality refers to the accuracy of time MRT reaches to fetch the riders at station; speed of the trip refers to the rapidity of the train travelling; and waiting time at the platform refers to the duration of time consumers wait for the train to reach.

All 31 MRT stations are only located around selected areas in Kuala Lumpur and few destinations in Selangor. Thus, the study will not represent the whole number of private cars and motorcycles registered in Kuala Lumpur and Selangor. Initially this research attempts to find the total number of motorcar and motorcycle users working within 5 km vicinities of MRT stations.

Area selected for survey will be within 5km radius of MRT Kajang or MRT Stadium Kajang in the south, MRT Tun Razak Exchange or MRT Bukit Bintang in the centre as well as MRT Mutiara Damansara or Kwasa Damansara in the northern part of MRT route. Reason being is that these locations were dispersedly apart from each other, located at the south, middle and northern part of the MRT line and these stations are among the busiest according to these segregated locations. The Sungei Buloh – Kajang (SBK) Line is the first line of the KVMRT Project involving 31 stations.

3.1 Measurement for Intention to use (ITU).

The measure for intention to use MRT proposed in the present study is adopted from the study of Borhan et al (2019) as well as Hussain et al (2020) with the adaptation from Taylor & Todd (1995) and Bhattacherjee (2000). These dimensions consisted of self-rating items on five-point Likert scale format level of agreeing and disagreeing, ranging from '1' "Strongly Disagree" to '5' "Strongly Agree" as per below table. Respondents are asked to indicate how intention to use MRT influence them to utilize MRT considering the results could show a relatively perfect predictive validity.

Dimensions	Items of Measurement	Sources
Intention to Use In General	ITU1- I intend to use MRT in general ITU2- I will make an effort to use the new train ITU3- In general, I like idea of using the MRT	Kwan et al (2020), Hussain et al (2020), Ibrahim et al (2020), Borhan et al (2019) and Borhan et al (2017)
Intention to Use MRT for Work or Study	ITU4- In the future, I intend to use MRT instead of my private transportation for my trip ITU5- I intend to use MRT to work or to school ITU6- Work commute using MRT during weekdays is a good idea ITU7- I intend to travel using MRT for business during weekend	
Intention to Use MRT for Recreational Purpose	ITU8- I intend to use MRT for socio- recreational activities ITU9- I intend to use MRT for meal, shopping or leisure during weekend ITU10- My intentions were to use MRT rather than private transport for travelling within Klang Valley	

3.2 Measurement for Timeliness (TL)

Items of measurement for time or timeliness are adapted from the study of De Ona et al (2016), Ab Majid et al (2020) and Puteela et al (2021). These dimensions consisted of self-rating items on five-point Likert scale format level of agreeing and disagreeing, ranging from '1' "Strongly Disagree" to '5' "Strongly Agree" as per below table. Respondents are asked to indicate how time or timeliness influence them to utilize MRT considering the results could show a relative significant of time or timeliness towards intention to use MRT.

Dimensions	Items of Measurement	Sources
Number of Transit	TL1- Transit Schedule influences my intention to use MRT TL2- Total number of schedule influences my intention to use MRT	Ab Majid et al (2020), De Ona et al (2016), Weng et al (2018), Dirgahayani & Sutanto (2020) and Pan & Truong (2018)
Punctuality	TL3- Punctuality influences my intention to use MRT TL4- Time Arrival of the train at the station influences my intention to use MRT TL5- Time Arrival at the destination influences my intention to use MRT	
Speed of the Trip	TL6- Speed of the trip influences my intention to use MRT TL7- Train speed influences my intention to use MRT TL8- Less number of stops during the travel influences my intention to use MRT	
Waiting time at the Platform	TL9- Waiting time on the platform influences my intention to use MRT TL10- Transit Time and Duration influences my intention to use MRT TL11- Waiting Time for Each Travel influences my intention use MRT	

Data Analysis and Result

The result answered two main objectives of the research which to determine the relationship between independent variables (timeliness) that influence the dependent variable (intention to use); and to determine the major factor that influence user behavioral changes into using the MRT services.

4.1 Descriptive Statistic

500 respondents were surveyed. The respondents are currently identified as the MRT user as the questionnaires are conducted based on approvals given by the respondent themselves as cross sectional interviewees and selected companies which within 5km radius of selected MRT stations were distribute with the questionnaires for the employee to answer.

4.2 Summary of Respondents

Variable	Categories	N	(%)
Gender	Male	203	40.6
	Female	297	59.4
Race	Malay	330	66.0
	Chinese	108	21.6
	India	62	12.4

Mean and Standard Deviation (SD) can be used as the measure of central tendency and variability (Mertler & Reinhart, 2017). Overall, all the variables studied had positive mean levels (see table below).

	Mean	Standard Deviation
Timeliness	3.3408	.73563
Intention to Use	3.6997.	.61734

Meanwhile skewness and kurtosis informed about the shapes of the distributions and the values should not exceed 3.0 as to determine their normality (West, Finch, & Curran, 1995).The variables' skewness and kurtosis did not exceed 3.0; therefore indicating the distributions did not differ significantly from normality. It is approximately normally distributed (see table below).

	Valid	Missing	Skewness	Std. Error	Kurtosis	Std. Error
Timeliness	500	0	-.138	.113	-.263	.225
Intention to Use	500	0	-.071	.113	-.443	.225

4.3 Factor analysis, KMO and Cronbach's Alpha

Factor analysis is one of the important steps in data analysis to reduce a vast number of variables to a meaningful, interpretable and manageable set of factors (Sekaran & Bougie, 2013). This is done by defining that the common underling cut-off point chosen for significant factor loading is 0.50, which was suggested by Hair et al., (2010). Based on the result of analysis, it shows 21 items were higher than 0.5 with range between .514 and .863 considered as acceptable as recommended by (Hair et al., 2010).

The purpose of KMO is to assess the strength of the relationships and suggesting factorability of the variables. According to Tabachnick and Fidell (2007) and Hair et al., (2010) stated the KMO must exceed 0.50. For actual data, results indicate the value of KMO has exceeded the minimum value 0.5 suggested by Tabachnick and Fidell (2007) also Hair et al. (2010) (see table 6).

Cronbach's alpha can be considered as a perfectly adequate indication of the internal consistency, and thus of reliability (Sekaran, 2000; Sekaran & Bougie, 2013). They also stated if Cronbach's Alpha is closer to 1, the reliability of the measures is higher. Cronbach's Alpha of 0.6 is considered poor, 0.7 is good and 0.8 is categorized as very good and 0.9 is categorized excellent. According to table 6, results showed that both variables Cronbach's alpha values yielded .70 and above suggested by Sekaran and Bougie (2013).

No Item	Item	Factor loadings	KMO	Cronbach's Alpha (α)
	Timeliness			
TL1	Transit Schedule influences my intention to use MRT	.610		
TL2	Total number of schedules influences my intention to use MRT	.629		
TL3	Punctuality influences my intention to use MRT	.514		
TL4	Time Arrival of the train at the station influences my intention to use MRT	.752	.841	.893
TL5	Time Arrival at the destination influences my intention to use MRT	.779		
TL6	Speed of the trip influences my intention to use MRT	.885		
TL7	Train speed influences my intention to use MRT	.811		
TL8	Less number of stops during the travel influences my intention to use MRT	.768		
TL9	Waiting time on the platform influences my intention to use MRT	.808		
TL10	Transit Time and Duration influences my intention to use MRT	.767		
TL11	Waiting Time for Each Travel influences my intention use MRT	.756		
	Intention to Use			
ITU1	I intend to use MRT in general	.788		
ITU2	I will try to use the new train	.863		
ITU3	In general, I like idea of using the MRT	.563		
ITU4	In the future, I intend to use MRT instead of my private transportation for my trip	.808	.811	.821
ITU5	I intend to use MRT to work or to school	.700		
ITU6	Work commute using MRT during weekdays is a good idea	.651		
ITU7	I intend to travel using MRT for business during weekend	.806		
ITU8	I intend to use MRT for socio-recreational activities	.773		
ITU9	I intend to use MRT for meal, shopping, or leisure during weekend	.881		
ITU10	My intentions were to use MRT rather than private transport for travelling within Klang Valley	.766		

4.5 Regression Analysis

In regression, it has been set that if the p value is less than 0.05 ($p = < .05$), the IV considered as having significantly related to the dependent variable. According to table 7 and 8, social media application was found to be significant and related to decision making, ($\beta = .215$; $p = .000 < .05$). Therefore, the hypothesis is accepted.

Coefficients					
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	β		
1	(Constant)	.737	.117		6.296	.000
	(H1) Timeliness	.181	.029	.215	6.170	.000

Note R2 = .645; adjusted R2 = .640 F = 119.145; sig. F = .000; ** p< .05.
Durbin-Watson = 1.945

Hypotheses	Result
H[1]: Timeliness will have a direct correlation on MRT intention to use.	Accepted

Conclusion, Limitations and Future Research Directions

As a conclusion, the purpose of the study is to investigate the relationship between timeliness towards behavioral change to use the MRT services. Results shows that there is a significant relationship effect between timeliness towards the intention to use. The result is aligned with the result and suggestion by Borhan et al (2019) as well as Hussain et al (2020) with the adaptation from Taylor & Todd (1995) and Bhattacherjee (2000) that emphasis on the clear benefits towards the potential target user. MRT services should be more efficient and effective to the potential target user so that they become more alert and lead to interest and desire.

Based on the findings, this study however was short of limitations. First, only Klang Velley MRT station user was studied. Not included other means such as LRT and KTM Komuter users. Despite the limitations in this study, these limitations provide suggestions for further research. First, it is recommended in future studies more research should be do for railways transportation providers. Second, suggestion for other public transports user as a part of respondent.

References

Ab Majid, Rohayu, Rosli Said, Norsiah Mohamad, Jamalunlaili Abdullah & Rohana Ngah (2020). *The Impact of Time Attribute on Mass Rapid Transport (MRT) Ridership in Malaysia.* Academia Industry Network, International Journal of Social Science Research, eISSN: 2710-6276 | Vol. 2, No. 4, pp338-349

Abdulrazzaq, Layth Riyadh, Mohammed Naeem Abdulkareem, Muhamad Razuhanafi Mat Yazid, Muhamad Nazri Borhan & Mina Salah Mahdi (2020). *Traffic Congestion: Shift from Private Car to Public Transportation.* Tehran. Civil Engineering Journal Vol. 6, No. 8, August, 2020, ISSN: 2476-3055, pp1547-1554

Ajzen, Icek (1991). *The Theory of Planned Behavior.* Organizational Behavior And Human Decision Processes. Elsevier, Volume 50, pp179-211

Borhan, Muhamad Nazri, Ahmad Nazrul Hakimi Ibrahim & Manssour A. Abdulasalm Miskeen (2019). *Extending the Theory of Planned Behaviour to Predict the Intention to Take the New High-Speed Rail for Intercity Travel in Libya: Assessment of The Influence of Novelty Seeking, Trust and External Influence.* Elsevier Ltd, Transportation Research Part A 130 (2019), pp373-384

De Ona, Juan, Rocío de Oña, Laura Eboli, Carmen Forciniti & Gabriella Mazzulla (2016). *Transit Passengers' Behavioural Intentions: The Influence of Service Quality and Customer Satisfaction.* Transportmetrica A: Transport Science, DOI:10.1080/23249935.2016.1146365, pp385-412

Dirgayahani, Puspita & Hansen Sutanto (2020*). The Effect of Transport Demand Management Policy On the Intention to Use Public Transport: A Case in Bandung, Indonesia.* Elsevier, Case Studies on Transport Policy, https://doi.org/10.1016/j.cstp.2020.03.004

Febriani, Devi, Mega Olivia C, Sita Aniisah Sholilah and Masjraul Hidajat (2020). *Analysis of Modal Shift to Support MRT-Based Urban Transportation in Jakarta.* IOP Publishing, Journal of Physics: Conference Series, 1573 (2020) 012015

Hair, J. F., Black, W. C., Balin, B. j., & Anderson, R. E. (2010). *Multivariate data analysis: A Global Perspective.* New York, Maxwell Macmillan International Editions, 7th Edition

Hsuang Chang & Tsung-Yu Lai (2009). *The Taipei MRT (Mass Rapid Transit) Tourism Attraction Analysis from the Inbound Tourists' Perspectives.* Taylor & Francis Group, Journal of Travel & Tourism Marketing (26), ISSN: 1054-8408 pp.445-461.

Hussain, Hussain Dhafir (2020). *Predicting The Commuter's Willingness to Use LRT, Utilising The Theory of Planned Behaviour and Structural Equation*. Journal of Applied Engineering Science, Vol. 18, No. 3, 2020, ISSN 1451-4117, pp403-412.

Ibrahim, Ahmad Nazrul Hakimi, Muhamad Nazri Borhan, Nur Asilah Zakaria & Siti Khairunisa Zainal (2019). *Effectiveness of Commuter Rail Service Toward Passenger's Satisfaction: A Case Study from Kuala Lumpur, Malaysia*. Research Paper. International Journal of Engineering & Technology, 8 (1.2) (2019), pp50-55

Kwan, Soo Chen Kwana, Rosnah Sutan & Jamal Hisham Hashim (2018). *Trip Characteristics as the Determinants of Intention to Shift to Rail Transport Among Private Motor Vehicle Users in Kuala Lumpur, Malaysia*. Elsevier, Sustainable Cities and Society 36 (2018), pp319-326

Kwan, Soo Chen Kwan, Rosnah Sutan & Jamal Hisham Hashim (2020). *Behavioral Framework of Attitude, Service Quality, Environmental Health Concerns and Intention to Use Rail Transport among Private Motor Vehicle Users*. Malaysian Journal of Medicine and Health Sciences (eISSN 2636-9346), pp288-297

Marcelo, Kelvin Ryan S and Karl B. N. Vergel (2019). *Survey Design of Stated Preference Method to Model Modal Shift to MRT Line 7*. Philippine Transportation Journal Vol. 2, No. 2, pp85 – 103

Ministry of Transports Malaysia (2019). *Statistik Pengangkutan Malaysia 2018*. Putrajaya. ISSN: 0128-2778: pp6 – 34

Ngah, Rohana, Lennora Putit, Azmi Mat, Jamalunlaili, Abdullah & Rohayu Ab Majid (2020). *Moderating Effect of Service Quality on Public Transport Travel Behaviour and Antecedents*. Faculty of Business and Management, Universiti Teknologi Mara (UiTM), Planning Malaysia: Journal of the Malaysian Institute of Planners, Volume 18 Issue 4 (2020), pp80-91

Nguyen, Duy Chinh, Huu Dung Hoang, Huu Tien Hoang, Quang Trung Bui and Lan Phuong Nguyen (2019). *Modal Preference in Ho Chi Minh City, Vietnam: An Experiment with New Modes of Transport*. Creative Commons Attribution 4.0, Sage Open Publication, https://doi.org/10.1177/2158244019841928, pp1-14

Nguyen, Ngoc T, Tomio Miwa & Takayuki Morikawa (2018). *Switching to Public Transport Modes for Commuting Trips: Considering Latent Motivations in Ho Chin Minh City*. Asian Transport Studies, Volume 5 Issue 1 (2018), pp117-136

Parahoo, Sanjai, Heather Harvey and Gihad Radi (2014). *Changing Consumer Behavior Paradigms: Does Passenger Age Impact Factors Influencing MRT Usage?* Macmillan Publishers Ltd. Volume 17 Number 1, Corporate Reputation Review, pp64-77

Puteela, Minhan, Othman Yeop Abdullah, Nizamuddin bin Dato'Hj. Zainuddin, Zulkufli bin Aziz (2021). *Shipper's Intention on Using Rail Transportation in The Case of Malaysia Border*. Journal of Global Business and Social Entrepreneurship (GBSE), Vol. 7: No. 20 (January 2021), eISSN : 24621714, pp73-87

Rahim, Sharifah Allyana Syed Mohd, Kak D-Wing, Noor Kamaliah Alias, Ahmad Azad Ab Rashid, Mohd Hafzi Md Isa, Mohd Rasid Osman, Siti Zaharah Ishak (2018). *Pelan Keselamatan Jalan Raya Malaysia 2014–2020: Laporan Status Pencapaian dan Cadangan Penambahbaikan*. Research Report. Kajang, Malaysian Institute of Road Safety Research (MIROS). MRR No: 256

Redman, Lauren, Margareta Friman, Tommy Garling & Terry Hartig (2013). *Quality Attributes of Public Transport that Attract Car Users: A Research Review*. Elsevier, Official Journal of the World Conference on Transport Research Society, Transport Policy 25 (2013), pp119 – 127

Schaffner, Carrie. (26th June 2017). *The Importance of Public Transportation for Sustainability in Arctic Cities*. Retrieved on 2nd March 2020 from https://blogs.gwu.edu/arcticpire/2017/06/26/the-importance-of-public-transportation-for-

sustainability-in-arctic-cities/

Shaharudin, Mohd Rizaimy, Amir Imran Zainoddin, Jamaludin Akbar, Dahlan Abdullah & Nur Hannah Saifullah (2018). *Determinants of the Passengers' Light Rail Transit Usage in the Klang Valley Malaysia*. Research Gate, International Journal of Supply Chain management, Vol. 7, No. 6, December, 2018 pp231-241

Tuan, Vu Anh (2015). *Mode Choice Behaviour and Modal Shift to Public Transport in Developing Countries – the Case of Hanoi City*. Journal of East Asian Society for Transportation Studies, Vol 11, 2015, pp473-487

Ubaidillah, Nur Zaimah (2020). *A Study of Car Demand and Its Interdependency in Sarawak*. Universiti Malaysia Sarawak. International Journal of Business and Society, Vol. 21 No. 3, 2020, pp997-1011

Van Dut. Vo (2017). *Accessibility and Connectivity Challenges 0f Mass Rapid Transit in Kuala Lumpur, Malaysia*. Paper Presented at MIT-UTM Malaysia Sustainable Cities Program. Massachusetts Institute of Technology. Malaysia Sustainable Cities Program, Working Paper Series.

Yusoff, Hasniza, Edie Ezwan M. Safian2, Kamalludin Bilal & Azlina M. Yassin (2019). *The Criteria of Railway Station in Malaysia: A Review of Issues in Facilities Improvement*. Department of Real Estate, Faculty of Technology Management and Business, University Tun Hussein Onn Malaysia. Science International (Lahore),31(2),283-287, 2019, ISSN 1013-5316; CODEN: SINTE 8, pp283 – 287

Zailani, Suhaiza Zailani,Mohammad Iranmanesh, Tajul Ariffin Masron & Tze-Haw Chan (2016). *Is the Intention to use Public Transport for Different Travel Purposes Determined by Different Factors?* Elsevier, Transportation Research Part D (29) 2016, pp18-24