

Passengers Preference and Satisfaction of Public Transport in Malaysia

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Abstract: Nowadays, Malaysia facing with an explosive growth in vehicle ownership and utilization, which led to traffic congestion and pollution. In this situation, government policy encourages people to use public transportation. However, Malaysia are prefer to use private vehicle become many reasons including bad quality of services. In this regard, public transport operators are forced to place emphasis on the monitoring and improvements of the services provided. This study focuses on traveler's satisfaction and preference towards public transport with service quality attributes. Self rate questionnaire was used to investigate overall customer satisfaction and factor that influence public transport users' satisfaction. A survey was conducted on an actual public transportation network in Kuala Lumpur, Malaysia. The aim was to evaluate the parameters in passenger preference and satisfaction on public transportation network using statistical model included variable such as facilities, comfortness and quality of services. Data were analyzed using descriptive, correlation, factor and multiple regression analysis. Result show that influences of satisfaction parameters are more than preference parameters. The application of this study suggest that the public transport operation especially buses must improve their quality of services to the prospect passengers.

Key words: Passengers, Preference, Satisfaction, Public Transportation, Travel Demand.

INTRODUCTION

In recent years, the number of car owners in Malaysia is growing rapidly. At present, total number of registered motor vehicles in Malaysia is approximately 18 million. Table 1 shows the number of vehicles registered in Malaysia according to state in the year 2011 (Road Transport Department, Highway Planning Unit 2011). At we can see majority of car owner are rapidly increased in Selangor, Federal Territory and Johor states. Thus this lead to massive traffic jams in the city center and surrounding area

Table 1: Motor vehicle registration in 2011.

	State	Total
1	Perlis	70,802
2	Kedah	901,988
3	Pulau Pinang	1,914,865
4	Perak	1,667,663
5	Selangor	2,092,989
6	Federal Territory	4,012,840
7	Negeri Sembilan	722,220
8	Melaka	610,370
9	Johor	2,494,722
10	Pahang	715,334
11	Terengganu	396,548
12	Kelantan	567,644
13	Sabah	719,937
14	Sarawak	1,112,077
	Total	18,000,000

To illustrate the rapid growth of the number of vehicle owners in Malaysia, the total numbers of motor vehicle registrations were compared from year 1990 to 2011. These comparisons are shown in Figure 1. This figure show that whitens 20 years the number of vehicle owners in Malaysia is increased around four times from 1990. On the other hand, road length and highway have limited growth but it is not enough to cover things massive growing in transportation. According to rapid growth of the number of vehicle owners it causes traffic jam, massive traffic jam and road accident.

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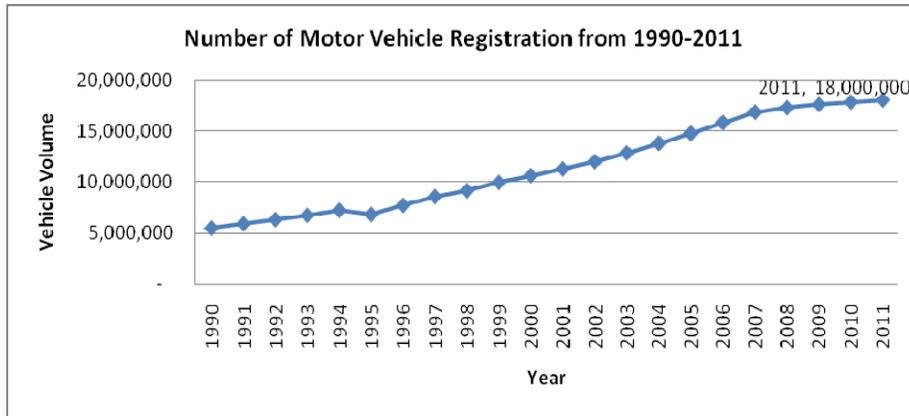


Fig. 1: Motor vehicle registration from 1990-2011.

In this situation, government policy encourages people to use public transportation instead of their private car for reduction of traffic congestion and air pollution (Hwe *et al.*, 2006; Ismail and Hafezi 2011), as well as, environmental concerns (Anable 2005). If the government did take proper action to deal with this problem Malaysia will suffer with high level of congestion and other negative causes such as environmental pollution and operating cost. In Malaysia there are growing use of public transport number such as commuter train, busses, minibus, mass rapid transit (MRT), light rail transit (LRT) and taxi, but people use this public transport are less as compare to private vehicle. Even though people are understood that public vehicle can cause traffic congestion causes longer travel time, pollution, and high consumption of non-renewable energy resource (Hafezi and Ismail 2011b).

Previous research consequently found that increasing travel demand and preferences in using private vehicle is causing rapid motorization in the developing countries and massive traffic jam (Ellaway *et al.*, 2003; Hafezi and Ismail 2011a). People prefer private car because of attractiveness of the modern car (Beirão & Sarsfield Cabral 2007; Hafezi and Ismail 2011c). Another factor that why people prefer private transport is because public transport still could not compete with the attractiveness of private car or motorcycle, such as inflexibility, no direct access, longer travel time, and unsafe when travelling.

With regards to this, public transport should become part of a solution for sustainable transport in the future. However, in order to keep and attract more passengers, public transport must to have high service quality to satisfy and fulfill wide range of different customer's needs (Oliver 1980; Anable 2005). It is important to understand what drives customer satisfaction and dissatisfaction towards public transport, so that we can help to design an attractive and marketable public transport.

A relatively good public transportation network needs to provide easy access and cheaper cost to the users. Operating cost and fixed cost are an important and noticeable issue for Transit companies. Also, travelling with high level of facilities, convenience and quality are significant for passengers. Study on behavior of passengers towards the use of public transportation also is important (Borhan *et al.*, 2011). It can summarize into two general parts included satisfaction and punctuality. According to Oliver (1997), satisfaction is defined as the customer's fulfillment. It is a judgment about the product or service feature. It is also related to pleasurable level of consumption-related fulfillment, including levels of under- or over-fulfillment.

Several studies regarding satisfaction and punctuality in public transport has been conducted to develop and create attractive public transport. Stradling *et al.*, (2007) conducted a survey in the Edinburgh, Scotland. They asked the passengers about their attitude towards feeling unsafe, preference of walking and cycling, problem with service provision such as no direct route, unwanted arousal, preference of car use, cost, disability and discomfort, and low self image. They founded that one influence issue to more encourage people to use public transportation is extended the public transport network cover. Gatersleben and Uzzell (2007) investigated affective experiences of daily commute. They studied through the satisfaction parameters in public transportation. The results revealed that commuting by car as well as by public transport can be stressful because of delays caused by the traffic volume. Also, public transports are stressful due to unpredictability and longer travel times.

Van Vugt *et al.*, (1996) conducted an investigation of the motivational factors underlying the decision to commute by car or public transportation through filed out a questionnaire. The findings provided strong evidence for the conclusion that individuals prefer options yielding shorter travel time as well as an alternative with high frequency of public transport. Beirão and Sarsfield Cabral (2007) summarize advantages in using public transport according to Portugal public transport users. The result highlights the importance of a cost

friendly and less stressful public transport service. It is perceived as less stressful since there is no need to drive, it is possible to relax and one may be able to rest or read.

Friman *et al.*, (2001) conducted a mail survey to investigate factors affecting customer satisfaction in public transport service in Sweden. The results showed that overall cumulative satisfaction related to attribute specific cumulative satisfaction and remembered frequencies of negative critical incidents for instance the driver behaves unexpectedly bad or the bus is leaving before scheduled departure time. Smith and Clark (2000); Ambak *et al.*, 2009 found that safety issue as a constraint for people to choose public transport as travel mode of choice. Pick pocketing, overcharging facilitates overcrowding and lacks of supervision are the most related safety issue (Smith and Clark 2000; Hafezi and Ismail 2011d).

To summarize, knowledge from previous research shows that public transport is still an alternative as a travel mode of choice for many people. In order to attract prospect passenger, public transport operator must improve their services to accommodate wide range of customers need and expectation (Beirão & Sarsfield Cabral 2007; Andreassen 1995). In this paper we studied passengers preference and satisfaction of public transport in the capital city of Malaysia, Kuala Lumpur.

Research Method:

This section presents the research approach used in this paper, research design, sample selection methods, data collection methods, and method of data analysis.

Research Design:

The independent variables used in this study are preference and overall satisfaction toward Malaysian public transport service. Dependent variables is specific service quality attributes which consist of public bus transport departure frequency, waiting time, fare, drivers behavior, punctuality, seat availability and comfortable, facilities inside the transportation means included music, baggage storing and air-condition, cleanliness, design and color of vehicle, travel information, facility for OKU (disable person) and facility for waiting at stations. Data were collected using questionnaire, the most common tool to assess respondents perception. Data analysis using statistical tool carried out in two ways, to investigate both global and local satisfaction on public bus transport.

Respondents:

Target respondent is a Malaysian house hold that is in the range of age between 15 and 60, living in Selangor state and Kuala Lumpur and has the experience of using public bus transport. The ages range 15 to 60 years old chosen because people in these age have a routine commute travel behavior and probably has taken public bus transport as their mode of choice. From the age of 15, the children usually have to go to school that is not in their own neighborhood. After age of 60, people usually may not have routine commuter behavior because they already pension. Total number of 616 respondents were randomly selected and completed questionnaire.

Questionnaire:

The questionnaire was divided into three parts: (1) Demographics, the items consist of correspondent to city they live, age, sex, driving license, access to private transport mode and recommendation to use public bus transport, (2) Travel pattern behavior, the related item concern about routine commute pattern, commute purpose, distance of travel, travel time, numbers of commute day in a week, majority daily transport of choice, and public bus transport use pattern, (3) items measuring satisfaction with parameters mentioned in research design. The questionnaire was developed based on Benchmarking in Asian Service of Public Transport survey's tool and previous research that conducted in Malaysia (Liden *et al.*, 2008). Respondents were asked to rate (1 to 7) their satisfaction to the item of overall satisfaction where 1 has low rate and 7 has high rate) and 14 items in specific quality attribute for public transport. Likert-type scale rate ranged from strongly disagree, disagree, neither agree nor disagree, agree and strongly agree.

Procedure:

Self-rating and handing out questionnaires were used as a data collection method in this study. Reasons of using three sections questionnaire to collect data are (1) The respondent has break time when fill out the questionnaire in order to understand the aim of each section questionnaire; and (2) questionnaire offers confidentiality. The respondents were asked to fill out the questionnaire at the station or at their convenient time. The data represents public preferences and satisfaction toward the conventional public transportation, which is very useful data the implementation of public transport in Malaysia.

Data Analysis And Results:

The aim of this study is to measure passengers preference and satisfaction towards public transport in Malaysia. SPSS software was used for data input and analysis. Data Analysis was conducted in three steps; first correlation analysis was undertaken to measure linear correlation between variables. Then factor analysis was performed with the aim to identify group or cluster of variables. Third, a regression analysis was performed to evaluate the contribution of each factor on overall satisfaction.

Factor Analysis:

Table 1 shows the KMO and Bartlett's test analysis for the constructs in the proposed model. The analysis found that the measurement of sample adequacy (MSA) KMO is 0.905 more than 0.5 (minimum value) and that the survey data suitable for analysis of principal component analysis (PCA). Similarly, Bartlett Sphericity test values were significant ($p < 0.001$), suggesting that the variables are closely related to each other and suitable for further analysis. Analysis of the suitability of the measurement matrix revealed that all the items in the MSA meet the compatibility matrix (> 0.5) and so are all the commonality in the range 0.4 to 0.7.

Table 1: KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.905
Bartlett's Test of Sphericity	Approx. Chi-Square	3532.406
	Df	105
	Sig.	.000

The principal component analysis (PCA), the values of the scale (loading), eigenvalues and percentage changes shown in Table 2. Varimax rotation methods were performed to produce the maximum value of the scale factor. The results shows that three factors were produced and the value of each item exceeds the value 0.4. While the eigenvalues of these three factors are 3.758, 2.990 and 1.990, respectively, with 58.25% of the total variability that can be explained. Meanwhile, the scree plot in Figure 1 also shows that there are three components that have eigenvalues ≥ 1.0 .

Table 2: Analysis of principal component analysis (PCA) for each item Rotated Component Matrix^a.

Item	Components		
	1	2	3
Q2	.799		
Q5	.747		
Q6	.646		
Q7	.719		
Q13	.841		
Q8		.627	
Q9		.717	
Q12		.623	
Q14		.581	
Q15		.615	
Q1			.778
Q3			.594
Q4			.658
Q10			.724
Q11			.372
Eigenvalues	3.758	2.990	1.990
% Variance	25.055	19.932	13.265
			$\Sigma = 58.25\%$

Note: ^avarimax rotation method with normalization rulers.

Multiple Regression Analysis:

In this study multiple regression analysis was performed to assess the contrabution variable for the preference model. Table 3 shows the ANOVA summary table or analysis of variance of the dependent variable and independent variable of Preference model. The analysis found that the F-test show that there is a significant relationship ($p = 0.000$) between the dependent variable (preference) with the independent variables (convenience, comfortness and quality of services).

Table 3: Summary of ANOVA table HBM model ANOVA^b.

Model	Total Power of Two	d.k	Mean Square	F	Sig.	Model
1	regression	87770.113	3	29256.704	1133.946	.000 ^a
	Error	15815.881	613	25.801		
	Total	103585.994	616			

- a. Predictors: (constant), Ease, Comfortness, Quality of Services
- b. Dependent variables: Preference

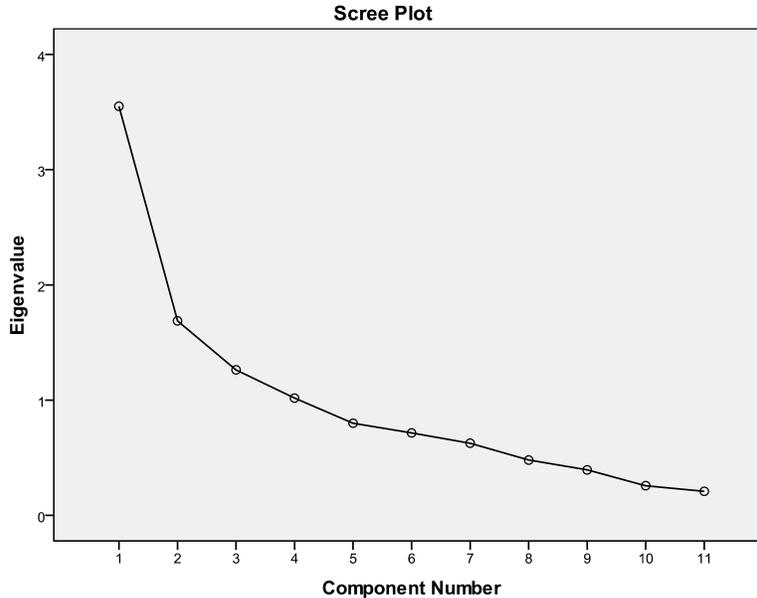


Fig. 1: Plot of the components in the model skri.

Table 4 shows the regression coefficients for Preference model. The analysis of all variables included convenience, comfortness and service quality has a significant relationship ($p < 0.05$), with variable preference. Facility can be summed variables have a positive influence ($\beta_1 = 0.44$) on the preference of the respondents use public transport more than the comfortness of variable ($\beta_2 = 0.34$) and Quality of Services ($\beta_3 = 0.30$). Provisional value of R^2 can explain the influences of independent variables on the dependent variable. According to Figure 2 this explains shows that 84.7 percent of variation in preference to public transport can be explained by the variables of convenience, comfortness and quality of services.

Table 4: Preference coefficient regression model Coefficients^a.

Model	Non-standardized coefficients		standardized coefficients	t	Sig.	R ²
	B	Standard Error	Beta			
(Constant)	-4.308	1.694		-2.543	.011	.847
Facility	1.214	.063	.436	19.336	.000	
Comfortness	.978	.068	.339	14.335	.000	
Quality of Services	.933	.064	.291	14.551	.000	

a. Dependent variables: Preference.

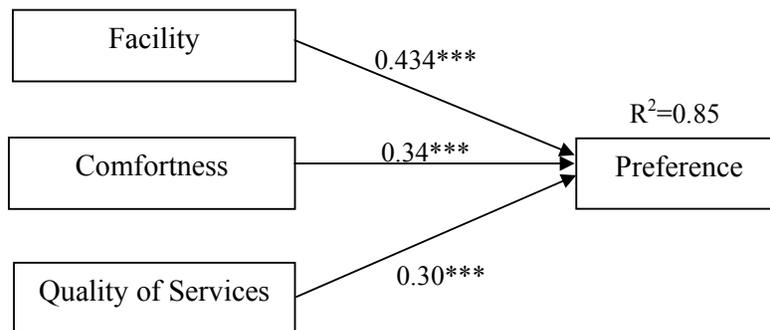


Fig. 2: Regression model preference for public transport.

Table 5 shows the ANOVA summary table or analysis of variance of the dependent variable and independent variables of model Satisfaction. The analysis show that there is a significant relationship ($p = 0.000$) between the dependent variable (satisfaction) with the independent variables (convenience, comfortness and quality of services).

Table 5: Summary of ANOVA tables Satisfaction model ANOVA^b.

Model	Total Power of Two	d.k	Mean Square	F	Sig.
1					
regression	87770.113	3	104033.302	3128.264	.000 ^a
Error	15815.881	613	33.256		
Total	103585.994	616			

a. Predictors: (constant), Ease, Comfortness, Quality of services
b. Dependent variable: Satisfaction

Table 6 shows the regression coefficients for satisfaction model. The analysis of the variables included convenience, comfortness and service quality has a significant relationship ($p < 0.05$), with variable satisfaction. The model of satisfaction presented in Figure 3 showed that facility can be summed variables have a positive influence ($\beta_1 = 0.91$) on the preference of the respondents used public transport more than the comfortness of variable ($\beta_2 = 0.55$) and good quality of services ($\beta_3 = 0.49$). Provisional value of R^2 can explain many variations by the independent variables on the dependent variable. This explains show that 84.7 percent of variation in satisfaction of public transport can be explained by the variables of convenience, comfortness and Quality of Services.

Table 6: Satisfaction coefficient regression model Coefficients^a.

Model	Non-standardized coefficients		standardized coefficients	t	Sig.	R ²
	B	Standard Error	Beta			
(Constant)	2.981	.600		4.971	.000	.835
facility	2.641	.047	.914	55.931	.000	
Comfortness	1.573	.045	.545	35.198	.000	
Quality of Services	1.241	.039	.488	31.552	.000	

a. Dependent variable: Satisfaction

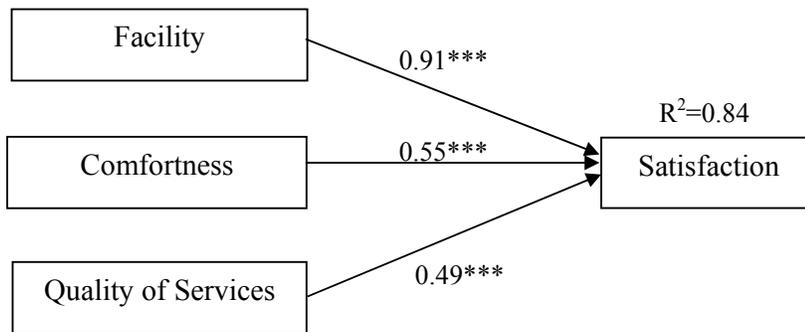


Fig. 3: Satisfaction Regression Model for Public Transport.

Discussion And Conclusion:

This paper aimed at investigating whether overall customer preference and satisfaction with Malaysian public transportation network is related to service quality attributes. Kuala Lumpur and Kelang Vally citizen were asked to rate their satisfaction on the conventional different kinds of transportation network on the paper and pencil questionnaire.

This study found that respondents have shown to rate their satisfaction level as lower than preference levels. This indicates that the quality of Malaysian public transportation network is under the travelers’ expectation of the service. Correlation analysis suggest the top four attributes that have strongest relationship with overall satisfaction are frequency, comfortable travel experience, security on board and travel time. People are prefer for good service quality but at the same time their satisfaction after use public transport below than expected. In this regards public transport operator must improve their service performance.

High increasing motorization in Malaysia causes many problems in traffic congestion, a high level of pollution, a high consumption non-renewable energy resource, a threat to quality of life and a high number of traffic accidents. Public transportation network should become the solution for sustainable transport in the future, which is the reason to increase customer satisfaction. High quality public bus transport not only keep customer to continue using public bus transport to fulfill their travel demand but also attract potential customer. The functional factor has a strong influence on customer satisfaction and need a higher attention to improve customer satisfaction. Frequency, price, punctuality and travel time are the crucial factor that is responsible in bringing higher level of satisfaction.

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REFERENCES

- Ambak, K., R. Atiq, R. Ismail, Intelligent transport system for motorcycle safety and issues. 2009. *European Journal of Scientific Research*, 28(4): 601-612.
- Anable, J., 2005. Complacent car addicts or aspiring environmentalist? Identifying travel behaviour segments using attitude theory. *Transport Policy*, 12(1): 65-78.
- Andreassen, T.W., 1995. (Dis)satisfaction with public service: the case of public transportation. *Journal of service marketing*, 9(5): 30-41.
- Beirão, G. and Sarsfield J.A. Cabral, 2007. Understanding attitudes towards public transport and private car: A qualitative study. *Transport Policy*, 14(6): 478-489.
- Borhan, M.N., R.A.A.O.K. Rahmat, A. Ismail, R. Ismail, 2011. Prediction of traveling behavior in Putrajaya, Malaysia. *Research Journal of Applied Sciences, Engineering and Technology*, 3(5): 434-439.
- Ellaway, A., S. Macintyre, R. Hiscock and A. Kearns, 2003. In the driving seat: Psychosocial benefits from private motor vehicle transport compared to public transport. *Transportation Research Part F: Traffic Psychology and Behaviour*, 6: 217-231.
- Friman, M., B. Edvardsson and T. Gärling, 2001. Frequency of negative critical incidents and satisfaction with public transport services. I. *Journal of Retailing and Consumer Services*, 8(2): 95-104.
- Gatersleben, B. and D. Uzzel, 2007. Affective Appraisals of the daily commute: comparing perception of the drivers, cyclist, walkers, and users of public transport. *Environment and Behavior*, 3: 416-431.
- Hafezi, M.H. and A. Ismail, 2011a. Interaction between Bus Stops Location and Traffic on Bus Operation. *Applied Mechanics and Materials*, 97-98: 1185-1188.
- Hafezi, M.H. and A. Ismail, 2011b. Balancing Between Headway and Frequency Scheduling for Bus Service. *Applied Mechanics and Materials*, 97-98: 669-673.
- Hafezi, M.H. and A. Ismail, 2011c. Bus Scheduling Model for Adjustment Headway of Bus Carriers. *Applied Mechanics and Materials*, 97-98: 911-915.
- Hafezi, M.H. and A. Ismail, 2011d. Study Behaviour of Passengers on Transit Operation. *Applied Mechanics and Materials*, 97-98: 1154-1157.
- Hafezi, M.H., A. Ismail and A.A. Shariff, 2012. A comparative analysis of fare collection system on bus operations. *Journal of Applied Sciences*, 12(4): 393-397.
- Hwe, S.K., R.K. Cheung and Y.w. Wan, 2006. Merging bus routes in Hong Kong's central business district: Analysis and models. *Transportation Research Part A: Policy and Practice*, 40(10): 918-935.
- Ismail, A. and M.H. Hafezi, 2011. Analyzing of Bus Operation to Obtain Regular Frequency for Neo-mission. *Australian Journal of Basic and Applied Sciences*, 5(11): 1275-1284.
- Oliver, R.L., 1980. A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research (JMR)*, 17(4): 460-469.
- Road Transport Department, Highway Planning Unit 2011.
- Smith, M.J. and R.V. Clarke, 2000. Crime and Public Transport. *Crime and Justice : A review of research*, 27.
- Stradling, S., M. Carreno, T. Rye, A. Noble, 2007. Passenger perceptions and Ideal urban bus journey experience. *Transport Policy*, 14: 283-292.
- van Vugt, M., van Lange, A.M. Paul and R.M. Meertens, 1996. Commuting by car or public transportation? A social dilemma analysis of travel mode judgements. *European Journal of Social Psychology*, 26(3): 373-395.