

## Statistical Overview on Quality Bus Services in Klang Valley

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### Abstract

*Malaysia is one of the fastest grown country in Southeast Asia. Urban development in this country has a same issues should be address as developed countries around the world such as traffic congestion and increasing development area as well as population. Urban area in these countries is facing tremendous traffic congestion problem due to increasing of car ownership day by day. Therefore, there is an urge to study the current state of West Klang public buses in order to provide a thorough picture of its service ratings and performances this paper presents the statistical analysis of the stakeholder perception on the bus service for urban transportation in West Kuala Lumpur. The scope of work for this study is to investigate stakeholders' views on bus service performance by did a survey in the west side of Klang Valley area only, which are and Puchong, Subang Jaya, Klang, Shah Alam, and Petaling Jaya. Several analyses have been conducted to identify the statistical analysis based on the data given by stakeholder. The result showed that, there are significant positive relationship between all attributes and bus performance. Result summary of hypotheses testing showed the positive relationship between variable. There are several issues should be improved to increase the quality of service for bus performance such as the on time performance buses, route service provided by operator and service coverage of bus. These are several issued have addressed by corresponding and users. Bus operator and government plays their roles tried to rectified all necessary issued and ensured that public opinion and user feedback would be heard. Feedback regarding level of service quality for bus performance should be conducted frequently.*

**Keywords:** *Quality of Service, Bus Performance, Bus Services, Public Transportation, Stakeholder Analysis*

### 1. Introduction

Urban area in these countries is facing tremendous traffic congestion problem due to increasing of car ownership day by day. Public transportation is one of the alternatives to overcome these issues. In 2010, approximately more than 1.20 million daily trips in Klang Valley represent more 20% used the public transport as a main transportation daily [5, 8]. RapidKL is the major bus company that operates in urban areas of Klang Valley. It is a serviced brand operated by Prasarana Malaysia. Land Public Transport Commission (SPAD) in December 2015 has established The Klang Valley Network Revamp to manage public transportation in Klang Valley[2]. SPAD has received feedback form users recently regarding the quality of bus service in Klang Valley. One of the comment been

made by user was the overcrowded issues and the insufficient number of trip to meet demand daily. The problem is mainly happen during peak hours, namely 7.00 am to 8.30 am and 5.30pm to 7.00pm [3]. There is a certain routes have established involve “social routes,” where demand probably not huge, but the services are necessary because people have no other mode of transportation. In West Klang Valley, bus service is the main public transportation system. However, several news reports had been published pertaining to poor bus services in the Klang Valley[14, 17]. Therefore, there is an urge to study the current state of West Klang public buses in order to provide a thorough picture of its service ratings and performances.

Today world is shifting toward faster traffic modes, which also are more energy intensive [1]. Road transportation caused many problems such as energy dependency, air pollution. A number of policies are developed to mitigate these problems, such as TDM (Travel Demand Management) techniques, ITS (Intelligent Transportation Systems), and changes in land us [19, 12]. Public transport gives access to services, activities and materials, helping people travel to their place of residence or work. Inaccessibility of a public transport system can be a major cause of social exclusion [9, 7]. Rapid bus is one of the transit service or bus service which is one of the major public transport services in Malaysia especially in West Klang Valley. Public bus services are popularly chosen in Malaysia by the public because of its low cost and bigger coverage as compared to air travel modes or rail. In Malaysia, most public bus services are mainly organized by private bus companies. Besides, governments also assists these bus companies by providing quality bus terminal, grant certain allocation to cover operation cost and also provides subsidized fuels [12, 6].

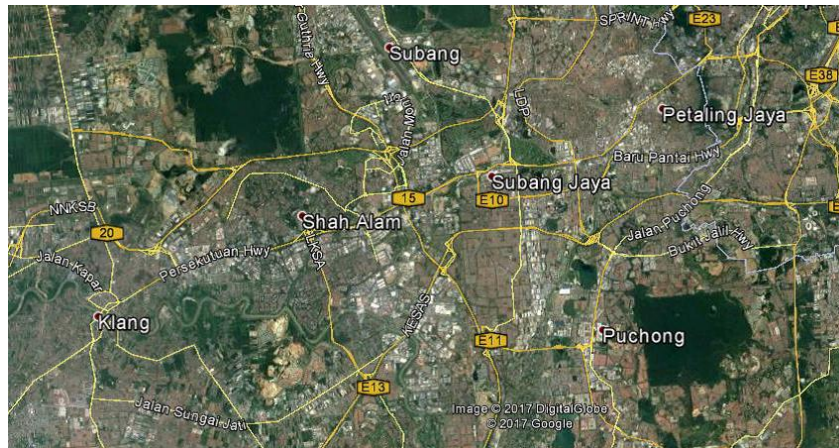
In general, performance refers to any investigation or assessment measure. A performance indicator is specifically defined as evaluations used towards the monitor the performance and performance goal. Public transport in particular of bus service performance is qualitative or quantitative factors used to evaluate certain criteria of bus transportation services [20]. A fruitful and proficient bus service is indispensable to strengthen the financial profitability, addition of populace and the development of the urban and country exercise [4, 15]. Other than that, a public bus service must have intensive availability that gives a solid, sheltered, astute, advantageous and viable transportation framework [2, 22]. The volume of transport demand realized clients with real transfer price is called the real traffic demand [11].

Currently, quality of service of Bus Company has become the issues marks by public. Quality of service is one of the important determinants of increasing of transport demand. Quality is an effective tool to increase and maintain the competitiveness of transport on the transport market [11, 23]. Poor service quality and quantity together with inefficiency of quality of service make low availability of local public transport service in many parts of the countries. For that reason, reform and countermeasures should be made to increase the operation efficiency of public transport. Although lots of studies analyze public transportation reform, most analyze the topic theoretically [18, 16]. There is importance issues of each attributes characterizing the overall performance should be address user which lead to erroneous estimation, because some attributes can be rated as significant even though they have little effect on overall performance, or they are important only in one of the parts of the assessment (during a particular operating condition) [21, 10]. Thus, this paper presents the statistical analysis of the stakeholder perception on the bus service for urban transportation in West Kuala Lumpur.

## 2. METHODOLOGY

These studied was covered urban area in West Klang Valley which were included Puchong, Subang Jaya, Klang, Shah Alam and Petaling Jaya. These selected areas located West Kuala Lumpur and consider as a satellite city for Kuala Lumpur. The scope of work

for this study is to investigate stakeholders' views on bus service performance by did a survey in the west side of Klang Valley area only, which are and Puchong, Subang Jaya, Klang, Shah Alam, and Petaling Jaya. Figure 1 show the area covered in this study. There are 500 surveys had been distributed at specific bus station for each location in studied area such as Puchong (Tesco Puchong), Subang Jaya (Terminal Metrobus, Subang Jaya) , Petaling Jaya (bus stop Kelana Jaya), Shah Alam (Bus Terminal, seksyen 17) and Klang (KlangSentral) as shown in Figure 2.



**Figure 1: The area of West Klang Valley.**



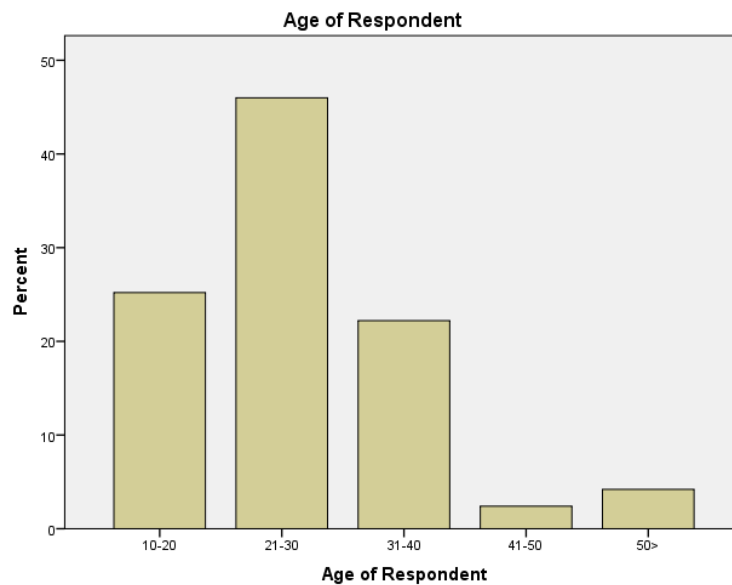
**Figure 2: Conducting Survey at Klang Bus Station**

In this study every of the data will be embedded in IBM SPSS (Statistical Package for Social Science) version 23.0 Software. Certain parameters have been selected in these studies for example survey distribution returns rates, descriptive analysis, demographic profile, and bus performance. The tests that were carried out using SPSS in this study such as Reliability test, Normality test, OnewayAnova test and Pearson's Correlation Analysis. Reliability test was to find the internal consistency of Cronbach Alpha for the statistical data. Normality test had been used because one of the major assumptions for parametric statistics was data in the population must be normally distributed.

OnewayAnova test was to determine whether there are any significant differences between the means of three or more independent groups. And for Pearson's Correlation test was to find the relationship between two variables. All the statistical data were been analyses to find its internal consistency, significant difference between means of groups and relationship between two and more variables.

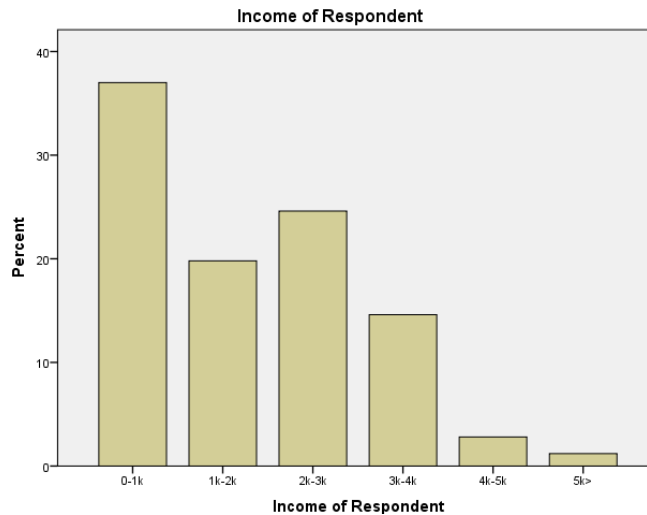
### 3. RESULT

500 sheet of survey questionnaire have been distributed at selection location. A 6 questions with 5-focuses Likert scale (from strongly disagree to strongly agree) study questionnaire has been produced. The objective respondents are the general population who were utilizing open transport transportation around West Klang valley, including Petaling Jaya, Subang Jaya, Klang, Shah Alam and Puchong. Since the research examine intends to decide the transport execution in West Klang Valley effectively, just respondent who live in the zone are engaged with this survey. This studies show that 100% distribution return rate from respondent. Based on result shows bus user in these studies area were at the age of 21-30 (46%), 10-20 (25.2%), 31-40 (22.2%), 50> (4.2%) and 41-50 (2.4%) as shown in Figure 4.



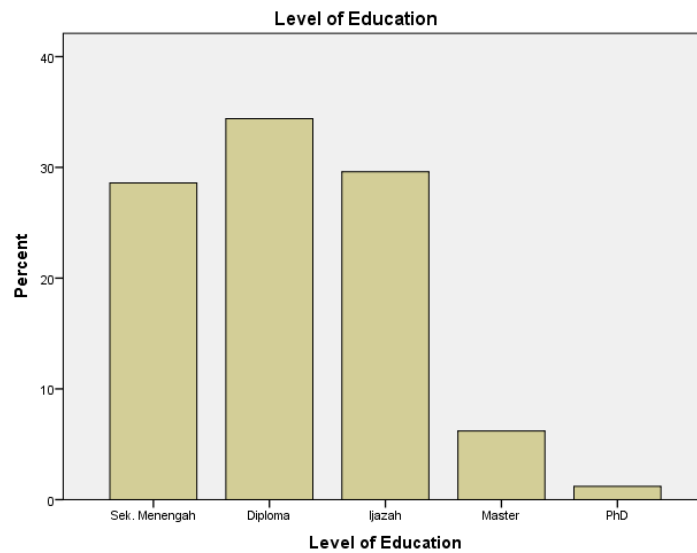
**Figure 3: Respondents' Age Group.**

Out of the 500 respondents responded (as shown in figure 5), 37% of users categorize have income of RM0 - Rm1,000, 19.8 % of users categorize have income of RM1,000-RM2000, 24.6 % of users categorize have income of RM2,000-RM3,000, 14.6 % of users categorize have income of RM3,000-RM4,000, 2.8% of users categorize have income of RM4,000-RM5,000 and 1.2 % of users categorize have income of more than RM5,000



**Figure 4: Respondents' Income.**

Out of the 500 respondents responded, there are 302 males (60.4%) and 198 females (39.6%). For academic level, there are 28.6% of users have level education up to Sekolah Menengah, 34.4 % of users have level education up to Diploma, 29.6% of users have level education up to Ijazah, 6.2% of users have level education up to Master, and 1.2% of users have level education up to PhD. Figure 4 shows the graph of academic qualification of bus user in these studied.



**Figure 5: Respondents' Level of Education.**

In empirical research distinctions are frequently made between various sizes of estimation. The most reduced level of estimation is the ostensible level. Reliability Test has been conducted for all samples to find its internal consistency. Study questionnaire was utilized to gauge extraordinary, hidden develops. The question of survey comprised

of six (6) questions. The scale had an abnormal state of inner consistency, as controlled by a Cronbach's alpha of 0.763. Albeit dropping certain qualities may diminish the Cronbach's alpha, for example, dropping On Time Performance or Service Frequency will diminish Cronbach's alpha to .706 or .712 separately. These is on account of the decrement of just 5.7% to 5.1% is genuinely immaterial. Table 1 showed the reliability test for all attribute in these studies.

Table 1: Reliability Test (All attribute).

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.763	.770	6

Survey questionnaire was utilized to gauge different, underlying develops. The develop, Service Frequency, Hours of Service, On Time Performance, Passenger Load, Transit Auto Travel Time, Service Coverage and Bus Performance, comprised one of each and six inquiries for Bus Performance. The scale had a generally abnormal state of interior consistency, as controlled by a Cronbach's alpha of 0.769 as shown in table 2.

Table 2: Inter-Item Correlation Matrix (All Attributes and DV).

	A1	A2	A3	A4	A5	A6	DV
A1	1.000	.536	.494	.268	.281	.422	.714
A2	.536	1.000	.463	.310	.276	.355	.706
A3	.494	.463	1.000	.346	.304	.437	.734
A4	.268	.310	.346	1.000	.199	.350	.628
A5	.281	.276	.304	.199	1.000	.337	.600
A6	.422	.355	.437	.350	.337	1.000	.708
DV	.714	.706	.734	.628	.600	.708	1.000

Researcher begins to decide the quality and bearing of the straight connection between two consistent variables utilizing Pearson's Correlation Analysis, following by Multiple Regression Analysis to foresee the ceaseless ward variable in light of multiple free variables. The inferential data analysis will start with expressing and clarifying the separate suppositions following by the testing of the suspicions. For better understanding and simplicity of alluding, the proposed calculated system is republished beneath. A Pearson's product-moment correlation was run to assess the relationship between service coverage and quality of service of bus at West Klang Valley (as shown in Table 3). Preliminary analyses showed the relationship to be linear

with both variables normally distributed, as assessed by Shapiro-Wilk's test ( $p > .05$ ), and there were no outliers.

There was a high positive correlation between online service coverage and quality of service of bus at West Klang valley,  $r(497) = .708$ ,  $p < .005$ . The effectiveness of service

coverage statistically explained 50% of the effect quality of service of bus. There was a statistically significant relationship between service coverage and quality of service of bus, so report can reject the null hypothesis and accept the alternative hypothesis. Researcher brings the Pearson's correlation analysis to another level in assessing the relationship between each of the four independent variables (A1 to A6). There was a small but definite positive correlation between A1 and A4,  $r(497) = .268, p < .005$ . The service frequency statistically explained only 8% of the passenger load and vice versa. There was a moderate positive correlation between A6 and A1,  $r(497) = .422, p < .005$ . The service coverage statistically explained only 18% of the service frequency and vice versa

Table 3: Pearson's Correlations (All Attributes and DV).

	A1	A2	A3	A4	A5	A6	Quality
A1 Pearson Correlation	1	.536**	.494**	.268**	.281**	.422**	.714**
A1 Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
A1 N	499	499	499	499	499	499	499
A2 Pearson Correlation	.536**	1	.463**	.313**	.278**	.357**	.706**
A2 Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
A2 N	499	500	500	500	500	500	499
A3 Pearson Correlation	.494**	.463**	1	.346**	.304**	.437**	.734**
A3 Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
A3 N	499	500	500	500	500	500	499
A4 Pearson Correlation	.268**	.313**	.346**	1	.201**	.354**	.628**
A4 Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
A4 N	499	500	500	500	500	500	499
A5 Pearson Correlation	.281**	.278**	.304**	.201**	1	.338**	.600**
A5 Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
A5 N	499	500	500	500	500	500	499
A6 Pearson Correlation	.422**	.357**	.437**	.354**	.338**	1	.708**
A6 Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
A6 N	499	500	500	500	500	500	499
Quality Pearson Correlation	.714**	.706**	.734**	.628**	.600**	.708**	1
Quality Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
Quality N	499	499	499	499	499	499	499

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Normality test for data also conducted in these studied. Two basic techniques researchers can use to check for the assumption of normality of the residuals are: (an) a histogram with superimposed normal curve or (b) a Normal Q-Q Plot of the studentized residuals (as shown in Figure 5) and The outcome demonstrated showed from the

histogram over that the Service Frequency seem, by all accounts, to be around normally distributed (as shown Figure 6). The outcome demonstrated showed from the histogram over that the Service Frequency seems, by all accounts, to be around normally distributed. The outcome showed from the Q-Q Plot over that in spite of the fact that the points are not adjusted superbly along the corner to corner line (the circulation is fairly topped), they are close enough to demonstrate that the residuals are close enough to typical for the analysis to continue.

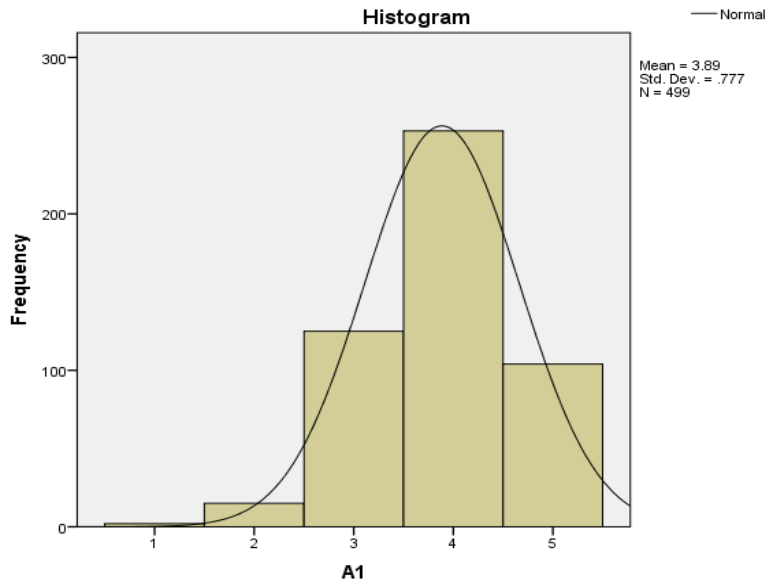


Fig6: Histogram of the Frequency against Service Frequency.

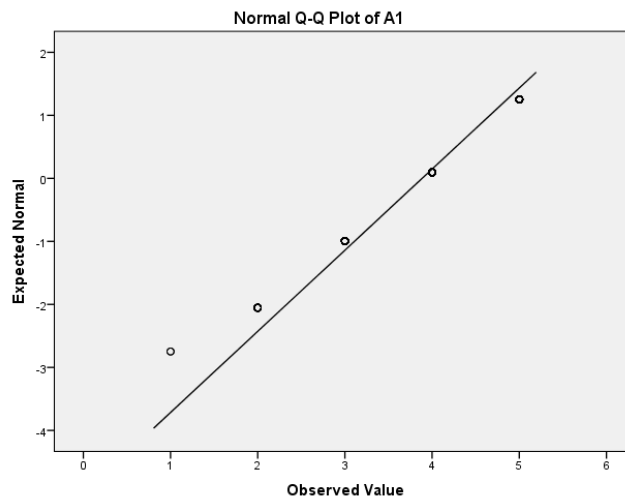


Fig7: Q-Q Plot of Service Frequency.

The outcome demonstrated that the "Sig." esteem is .000, which really implies that  $p < .0005$ . On the off chance that  $p < .05$ , researcher have a statistically critical outcome. Then again, if  $p > .05$ , researcher don't have a statistically huge outcome. As  $p < .0005$  fulfills  $p < .05$ , the report has a statistically huge outcome as shown in Table 4.



Table 4: ANOVA.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2108.298	4	527.074	65.643	.000
Within Groups	3966.520	494	8.029		
Total	6074.818	498			

This implies the expansion of all our free variables (e.g. the general model) prompts a model that: (an) is statistically essentially better at foreseeing the needy variable than the mean model; and (b) is a statistically fundamentally preferred fit to the data over the mean model. The invalid speculation of this test is that the multiple correlation coefficients, R, is equivalent to 0 (zero). Researcher can likewise reason from this outcome that no less than one regression (slant) coefficient (e.g. but the catch) is statistically essentially different to zero.

Therefore, based on the inferential data analysis, the result manages to test the hypotheses. Following summary as shown below:

H1: There is a significant positive relationship between service frequency and quality of service of bus.

H2: There is a significant positive relationship between hours of service and quality of service of bus.

H3: There is a significant positive association between on-time performance and quality of service of bus.

H4: There is a significant positive relationship between passenger load and quality of service of bus.

H5: There is a significant positive relationship between transit auto travel time and quality of service of bus.

H6: There is a significant positive association between service coverage and quality of service of bus.

Based on the hypotheses above, it shows that all factors have significant positive with quality of service of bus.

#### 4. CONCLUSION

The principle central research structure for this study was to assess the bus service performance in five different zones in west Klang Valley which are Puchong, Subang Jaya, Shah Alam, Petaling Jaya and Klang essentially at their significant transport station. This paper presents the statistical analysis of the stakeholder perception on the bus service for urban transportation in West Kuala Lumpur. No questions have been additionally dropped from the survey questionnaire to enhance the current Cronbach's alpha of 0.769, since dropping different inquiries may diminish the Cronbach's alpha. There no less than one regression (slant) coefficient (e.g. but the catch) is statistically essentially different to zero. Besides, there are significant positive relationship between all attributes and bus performance. Result summary of hypotheses testing showed the positive relationship between variable. The outcome of these studies could be used as a reference for operator

and authorities to evaluate the significant the public transport user in Lembah Klang. There were several issues that should be solved by operator such as widen coverage area, service frequency and the punctuality of bus driver. Further studies regarding these studies are highly recommended in future.

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