November-December 2019
ISSN: 0193-4120 Page No. 3779 - 3786

Assessing Stakeholder's View for Quality Bus Services in Kuala Lumpur

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Abstract
Malaysia will be one the developed countries in the next 10 years. Major cities such as Klang Valley will receive big impact on this development. Population and vehicle will growth as same as development year by year in especially in Klang Valley. The increase of vehicle in this country has caused a major problem in Klang Valley. The government has provided certain initiative to resolve this issue by implementation of Bus Network Revamp (BNR) in 2015. There is no comprehensive studies has conducted to evaluate the quality of bus in West Kelang Valley previously. The objective of this initiative is to reorganize and rearrange the existing bus service in Klang Valley in order to improve their service quality. this study was aimed to determine the of stakeholder's view on the bus performance in West Klang Valley. 500 questionnaires have been distributed in targeted area in West Klang Valley such as Puchong, Subang Jaya, Klang, Shah Alam and Petaling Jaya. Specific criteria have been selected in order to determine the quality of bus service in these studies. Based on the result showed that, the overall quality of bus service in Puhong, Klang and Petaling Jaya have Medium qualityof bus service meanwhile Shah Alam and Subang Jaya have Good quality of bus service. Subang Jaya routes has received highest number of "Very Good" feedback from respondent compared with other routes. These studies only covered five main cities in West Klang Valley. Therefore, furthers studies in these area should be covered all routes in Klang Valley, as to provide a better comparison between quality of service of bus and stakeholders' views on bus performance in West Klang Valley. There is few problems should encounter regarding public transport issues in Klang Valley. As a public service provider, feedback from passenger is important and all weakness should be address in future.

Keywords: *Quality of Service, Bus Performance, Stakeholder view, Urban Area, Public Transportation*

1. Introduction

Nowadays urban bus transport has a continuing decline in output as well as the transported passenger. To improve the situation, stabilization, resp. increase performance, it is needed to identify the various factors that decrease the demand for bus services[8,23].

Quality of service is a significant indicator of transport demand. Quality is an effective tool to maintain and increase the competitiveness of transport on the transport market [14]. Transportation system's ability to provide all members of society with equal access to opportunities and services refers to the social sustainability of transport.

November-December 2019
ISSN: 0193-4120 Page No. 3779 - 3786

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, 11]In Malaysia, the Bus Network Revamp (BNR) was carried out by Land Public Transport Commission (SPAD) on 1 December 2015 to improve urban public transport in more prominent in Kuala Lumpur or Klang Valley. The biggest operator bus network in Malaysia is Rapid Bus. The mainly bus company that works in Klang Valley, Puchong, Subang Jaya, Petaling Jaya and Serdang is the RapidKL[3,2].The Commission also continues to take serious action against operators who fail to fulfil with the agreed frequency and fleet capacity to guarantee optimum service. This includes the ongoing performance evaluation and periodic reassignment of routes to other operators who have better capability to manage the agreed schedule to meet bus ridership expectations [3].

The authorities are suggesting people to use public transport but daily commuters have a lot of bad comments about the bus service in the Klang Valley. They are really frustrated about overcrowded buses with the number of trips insufficient to meet demand [17]Developed countries are set up goals to increase energy efficiency for facing the increasing price of fuel. Energy related to individual movement and living is a big contributor to energy consumption. With increasing in the ways of living, the world is shifting toward faster traffic modes, which also are more energy intensive [4, 5]. 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 use [21, 22]. In order to control the quality of life of a city's inhabitants, a balanced public transport system is required for social, environmental, and economic sustainability and is a prerequisite [5, 15]Between supply and demand, the balance for public transport involves the continuous improvement of buildings and the adaptation of the socio-economic land use model. As a matter of fact, transport and land use interact dynamically at many different levels and determine the social and environmental sustainability of the urban environment [9,18].

The overall performance of transport network becomes an issue of maximum importance because it is known that an improvement in the level of quality of the service leads to an increase of the use of the system and to a higher satisfaction of the passengers[12, 13]. Overall performance of bus network system is related to a series of criteria describing the bus transport services [24,16]. In a previous studies conducted on the Ipoh – Lumut, and followed by obtained results were referred to the Transit Capacity and Quality of Service Manual. This on-board survey was conducted to obtain necessary data related with service quality such as punctuality arrival, expected time waiting, frequency, headway and operating speed [19].Quality is an effective tool to increase and maintain the competitiveness of transport on the transport market. Suburban bus transport has a continuing decline in output as well as the transported passengers. Quality of services provided is one of these factors. The study deals with the application and design of the methodology for calculating and investigating the impact of quality of service on users demand for suburban bus transport [14, 20].Based on, previous findings and studies has provided knowledge on research variables such as stakeholders' demography, quality of services and bus performance [6, 10]. The questionnaire should be propelled, spread to the engaged and be checked to ensure the request are appropriate, all around sorted out, and possible to the respondents [1].Thus, these studies aimed to evaluate the of stakeholder's view on the quality of bus services in West KlangValley.

2. Methodology

This study was covered on the steps described model procedure for investigating stakeholder's views for bus transportation performance in urban area. This study was conducted in December 2019 in West KlangValley. The area that utilized for this study was located at West Klang Valley which was included Puchong, Subang Jaya, Klang, Shah Alam and Petaling Jaya. Figure 1 show the area covered in this study. There were 500 survey have been distributed mainly at every main bus station for each place due to highest number of users such as in Puchong (Tesco Puchong), Subang Jaya (Terminal Metrobus, Subang Jaya) as shown in Figure 2, Petaling Jaya (Bus stop Kelana Jaya), Shah Alam (Terminal Seksyen 17, Shah Alam) and Klang(KlangSentral). These areas have been selected in these studies due strategic location and have high traffic user in this area

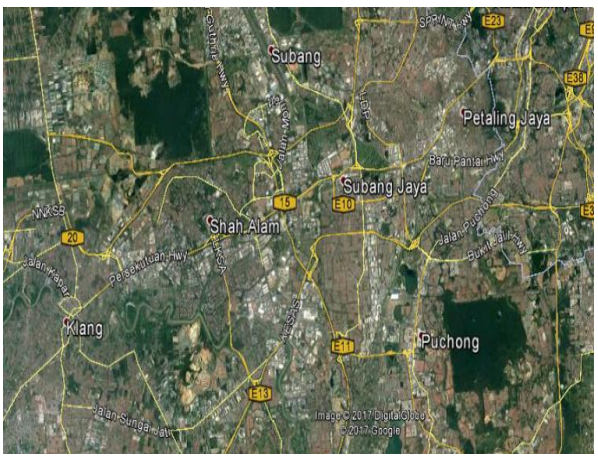

Figure 1: The area of West Klang Valley.

November-December 2019
ISSN: 0193-4120 Page No. 3779 - 3786

Figure 2: Surveying in Subang Jaya (Terminal Metrobus).

A few set of data scale of Measurement have been selected in this study. Each of the attribute of construct has their specific measurement. The Likert scale for each attribute were measured by A, B, C, D and E with their own criteria. Table 1 to Table 6 shows the attribute that have been selected in this study included with their specific measurement items.

Table 1: Service Frequency and Measurement Item

Construct	Measurement Items
A	1. Average headway above 5 minutes is rated as excellent.
B	2. Average headway between 5 to 10 minutes is rated as good.
C	3. Average headway between 11 to 15 minutes is rated as average.
D	4. Average headway between 16 to 30 minutes is rated as fair.
E	5. Average headway between 31 to 59 minutes is rated as poor.

Table 2: Hours of Service and Measurement Item

Construct	Measurement Items
A	1. Hour of service above 18 hours is rated as excellent.
B	2. Hour of service between 15 to 18 hours is rated as good.
C	3. Hour of service between 12 to 14 hours is rated as average.
D	4. Hour of service between 7 to 11 hours is rated as fair.
E	5. Hour of service between 4 to 6 hours is rated as poor.

Table 3: On-time Performance and Measurement Item

Construct	Measurement Items
A	1. On time performance 95% to 100% is rated as excellent.
B	2. On time performance 90% to 94% is rated as good.
C	3. On time performance 80% to 89% is rated as averaged.
D	4. On time performance 70% to 79% is rated as fair
E	5. On time performance below than 70% is rated as poor.

Table 4: Passenger Load and Measurement Item

Construct	Measurement Items
A	1. Service Level Up to 50% seated load is rated as excellent.
B	2. Service Level Up to 80% seated load is rated as good.
C	3. Service Level Up to 100% seated load is rated as average.
D	4. Service Level Up to 125% seated load is rated as fair.
E	5. Service Level Up to 150% seated load is rated as poor.

November-December 2019
ISSN: 0193-4120 Page No. 3779 - 3786

Table 5: Transit Auto Travel Time and Measurement Item

Construct	Measurement Items
A	1. Transit-Auto Travel Time Ratio below 1 is rated as excellent.
B	2. Transit-Auto Travel Time Ratio between 1 to 1.25 is rated as good
C	3. Transit-Auto Travel Time Ratio between 1.25 to 1.5 is rated as averaged.
D	4. Transit-Auto Travel Time Ratio between 1.5 to 1.75 is rated as fair.
E	5. Transit-Auto Travel Time Ratio between 1.75 to 2 is rated as poor.

Table 6: Service Coverage and Measurement Item

Construct	Measurement Items		
A	90.0% -100.00%	•	Virtually major origins and destination served.
B	80.0% - 89.9%	•	Most major origins and destinations served
C	70.0% - 79.9%	•	About ¾ of higher density areas served
D	60.0% - 69.9%	•	About ¾ of higher density areas served
E	50% - 59.9%	•	At least ½ of the higher density areas served

The value of the data were determined accordingly such as "A"= Very Good, "B"= Good, "C" =Medium, "D" = Bad and "E"=Very bad represent 5 Marks, 4 Marks, 3 Marks, 2 Marks, and 1Marks respectively. Selected equation has been used in order to determine Level of Service (LOS) of attribute based on bus performance based on placed. Equation 1 shows the equation that has been used to determine the Quality of Service (QOS).Table 7 shows the Grade of Quality of service for each attribute.

$$QOS = \frac{[(A\ x\ NA)+(B\ x\ NB)+(C\ x\ NC)+(D\ x\ ND)+(E\ x\ NE)+(F\ x\ NF)]}{Total\ of\ N} \quad \text{Eq.1}$$

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, ideally 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.Out of the 500 respondents responded, there are 126 users from 10-20 years old age group (about 25.2%), 230 users from 21-30 years old age group (about 46.0%), 111 users from 31-40 years old age group (about 22.2%), 12 users from 41-50 years old age group (about 2.4%), and 21 users from more than 50 years old age group (about 4.2%).

Graph 2 shows the graph of overall respondent based on the each specific measurement items. The graph shows that the average respondents have rated "C" as Medium for Overall attribute for each item. Each place is been categorized based on the calculation value of their Quality of Service as shown in Methodology section. The result shows that Puchong is been categorized as quality service of C, Shah Alam is been categorized as quality service of B, Subang Jaya is been categorized as quality service of B, Klang is been categorized as quality service of C and Petaling Jaya is been categorized as quality service of C.

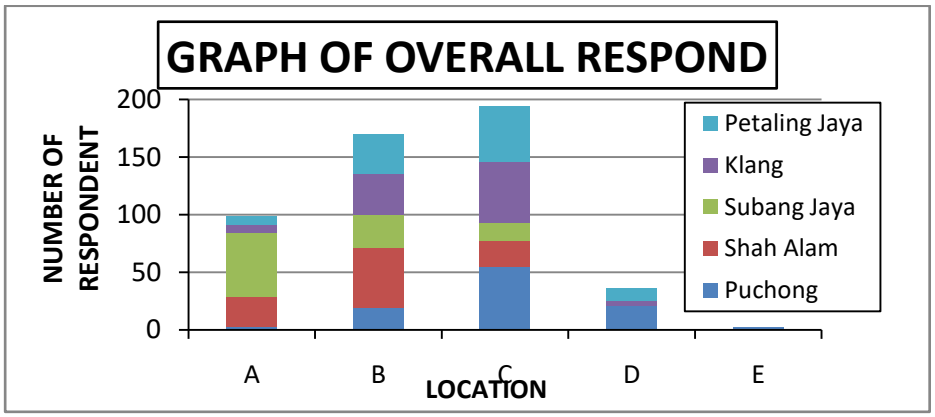

Figure 3: Graph of Overall Overview of Respondent.

November-December 2019
ISSN: 0193-4120 Page No. 3779 - 3786

Based on the stakeholder's perspective, the service frequency is the means by which frequently the traveler can access the service. In any case, for the administrator's perspective, a high service frequency will influence service and capital cost. Be that as it may, with a high frequency, the allure of the framework will be a decent in addition to point in having a high ridership. The results collected have been sorted based on attribute of bus performance. Figure 3 shows the number of respondent based on service frequency. Out of 500 respondents responded, there are 2 users voted for Very Bad, 15 users voted for Bad, 125 users voted for Medium, 254 users voted for Good and 104 users voted for Very Good. Therefore, the quality of service based on service frequency can be categorized as Quality of Service B.

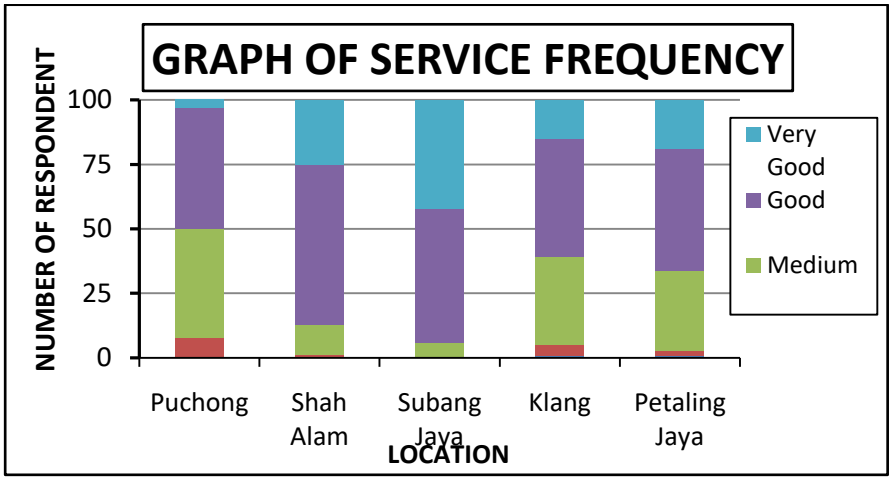

Figure 4: Graph of service frequency.

Hours of service are the number of hours in a day the service is provided along a route, available at a particular location, or is available between two locations. Thehigh number of trips can be provided by having longer hours of service. This will also allow passengers more flexibility in terms of their return trip. Therefore, Perspectives from bus rider can be collected in this study. Figure 4 shows that out of 500 respondents responded, there are 19 users voted for Bad, 134 users voted for Medium, 222 users voted for Good and 125 users voted for Very Good. Therefore, the quality of service based service hours can be categorized as Q of Service B.

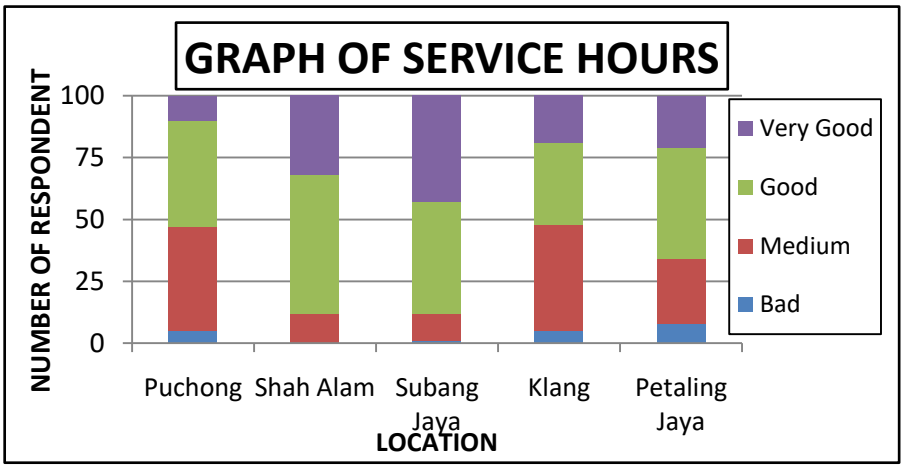

Figure 5: Graph of service hours.

On-time performance is the rate of passing planned trips separated by the adding up to number of planned trips accessible for examination. On-time performance is vital for the passengers riding on the bus and for the passengers holding up at a halt amid a time period with huge bead-ways. Figure 5 shows thatthe total of 500 respondents responded, there are 23 users voted for Bad, 168 users voted for Medium, 211 users voted for Good and 98 users voted for Very Good. Therefore, the quality of service based on time performance can be categorized as Q of Service B.

November-December 2019
ISSN: 0193-4120 Page No. 3779 - 3786

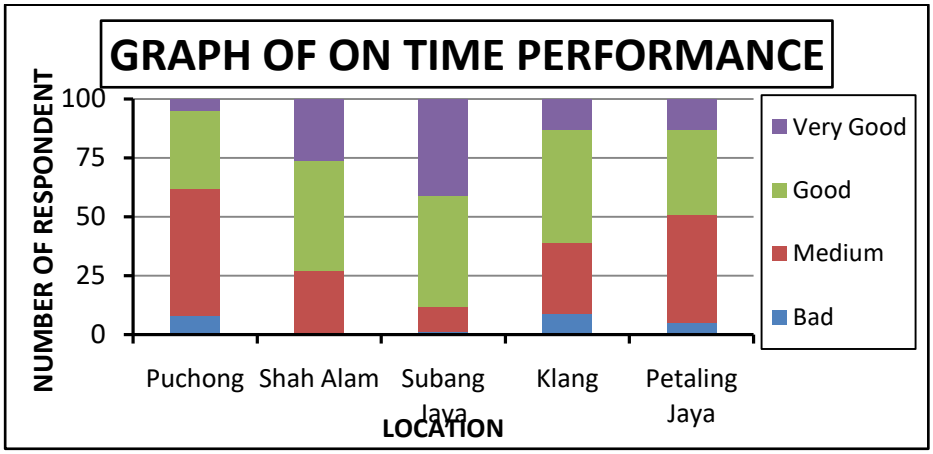

Figure 6: Graph of on time performance.

The passenger and operator have different views on this matter. Firstly, on the passenger's point of view, the passenger load will affect the comfort on the vehicle such as finding a seat. On the other hand, on the operator's point of view, an increase in passenger volume in the vehicle needs an upgrade on the vehicle size or increasing the service frequency to ensure comfort for the passengers. Figure 6 shows that, out of 500 respondents responded, there are 12 users voted for Very Bad, 52 users voted for Bad, 176 users voted for Medium, 176 users voted for Good and 84 users voted for Very Good. Therefore, the quality of service based on passenger load can be categorized as Q of Service B.

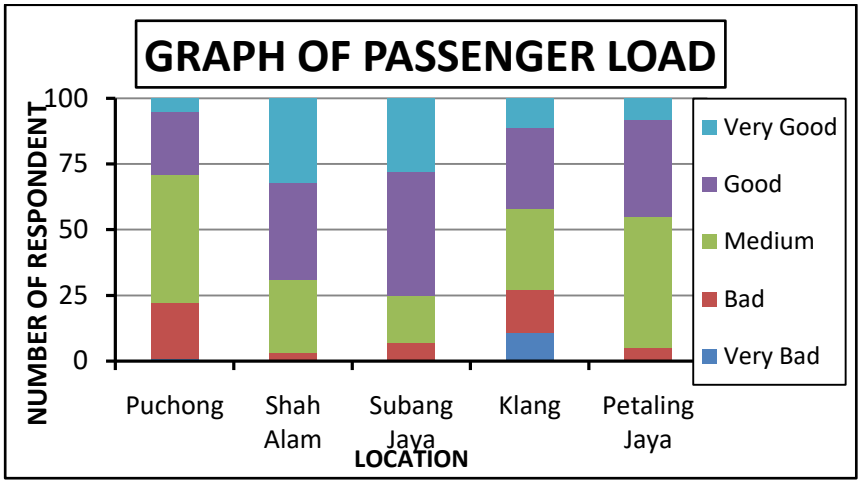

Figure 7: Graph of passenger load.

Transit auto travel time is an estimation door to door different between transit facilities and automobile travel. Travel time for transit facilities is incorporate the in-vehicles time for trip and its does not include the waiting time for vehicles to reach. Travel time for automobiles incorporates the travel time in the vehicles, time to park the vehicles and time to walks to destination.Figure 7 shows the total of 500 respondents responded, there are 10 users voted for Very Bad, 77 users voted for Bad, 192 users voted for Medium, 171 users voted for Good and 50 users voted for Very Good. Therefore, the quality of service based on Transit auto travel time can be categorized as Q of Service C.

November-December 2019
ISSN: 0193-4120 Page No. 3779 - 3786

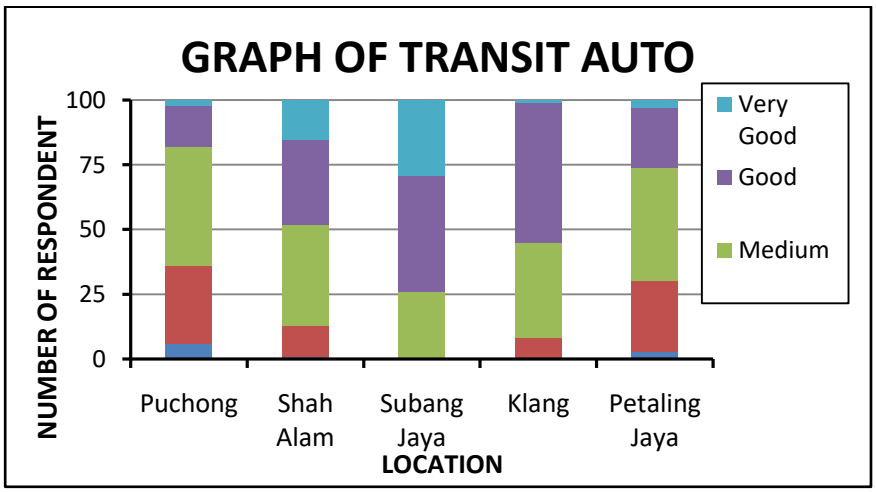

Figure 8: Graph of Auto Transit.

Service coverage is the area or route provided to the nearest station or stop. There are four transit access modes which are walking, bicycling, auto drop-off and auto park-and-ride. The service coverage is the area located within the walking distance to the nearest station or stop.Figure 8 shows that,out of 500 respondents responded, there are 1 user voted for Very Bad, 41 users voted for Bad, 178 users voted for Medium, 201 users voted for Good and 79 users voted for Very Good. Therefore, the quality of service based on Transit auto travel time can be categorized as Q of Service B.

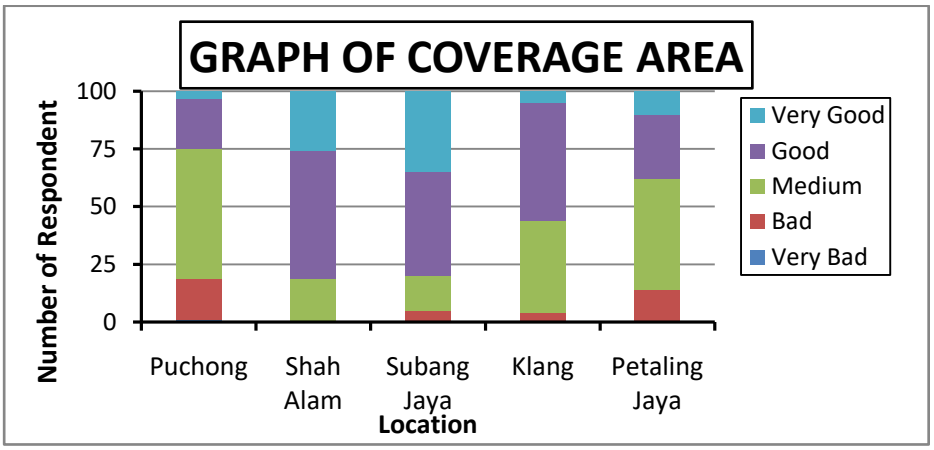

Figure 9: Graph of Coverage Area.

4. Conclusion

This study was to assess the bus service performance in five different zones in west Klang Valley which werePuchong, Subang Jaya, Shah Alam, Petaling Jaya and Klang essentially at their significant transport station. Each place had been categorized based on the maximum value of their Quality of Service. Puchong is been categorized as quality service of C, Shah Alam is been categorized as quality service of B, Subang Jaya is been categorized as quality service of B, Klang is been categorized as quality service of C and Petaling Jaya is been categorized as quality service of C. Subang Jaya routes has received highest number of "Very Good" feedback from respondent compared with other routes.Bus service still consider one of the main public transport in West Klang Valley. Based on the result shows that, there is few problems should encounter regarding public transport issues in Klang Valley. As a public service provider, feedback from passenger is important and all weakness should be address in future.By conducting these studies all important key player in public transport such as bus provider, authority and government could access necessary respond regarding bus service quality from passenger and users. These studies should be repeated with more comprehensive scope and coverage to obtain better understanding on passenger feedback regarding public bus service performance in West Klang Valley. In conclusion, overall passenger feedback regarding bus performance in West Klang Valley is C, which requirement more improvement in future.

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