# Investigation on the Public Bus Issues in Kota Kinabalu City

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**ABSTRACT** The public bus services play an important role in city. However, the number of public transport users is declining day by day and the public chooses to own and use private vehicles due to its convenience. Consequently, number of vehicles on the road increases which lead to severe road congestion. Hence, this study identifies the issue of public transportation in Kota Kinabalu that deters from the establishment of integrated public transportation system. Data were collected through site observation and survey questionnaire at selected study area and responses from bus users was analyzed using SPSS software. The results show that the public are dissatisfied with the overall quality of public bus services in Kota Kinabalu especially in terms of public bus transfer/interchanges, bus trip schedule, waiting time, walking distance to bus stop, route planning, comfort, the punctuality of bus arrival as well as the overall quality of bus stops. It is found that current public bus service is uncomfortable for older bus user. Apart from that, the quality of public bus differs across line of services where better quality service experienced in areas closer to CBD. In order to make transition into an integrated public bus system, improvement of the overall public bus quality need to takes all these factors into account.

**KEYWORDS:** Public Transportation, Public Bus Services, Urban Mobility, Passenger transport, Bus Quality.

## INTRODUCTION

Public transportation system provides transit services for the public including bus services. Bus operation service depends on various factors such as population, culture, environment and economy (Rohani *et al.*, 2013). In Malaysia, buses are common and widely available public transportation especially in urban areas located outside Kuala Lumpur.

Quality of public transport plays a major role in increasing the demand for public transportation. Maintaining a high standard of quality in bus services and performance is crucial in encouraging people to make public transport such as bus as their preferred mode of transportation (Rohani *et al.*, 2013). The quality of public transport also acts as an effective tool to maintain and increase the competitiveness of public transportation system provides transit services for the public including bus services. Bus operation service depends on various factors such as population, culture, environment and economy (Rohani *et al.*, 2013). The quality of public transport also acts as an effective tool to maintain and increase the competitiveness of public transport in the transport market (Berežný & Konečný, 2017). Through literature, among the indicators that influenced the quality of public transport service are route planning, walking distance, number of transfer/ interchanges, fare, scheduling, punctuality, waiting time, frequency, comfort, cleanliness, and safety.

As the capital city of Sabah, Kota Kinabalu has developed at a rapid pace causing the increasing demand of growing economy and population towards its transportation system. The available land public transportation mode in Kota Kinabalu include minibus, transit bus, rental bus, express bus, taxi, rail-based train and e-hailing ride. However, the main public transportation use in Kota Kinabalu are buses. Over the years, the demands for public transportation in Kota Kinabalu has risen resulting in more people choosing public transportation as a mean for travelling around the city. Among the factors are worsening traffic congestion and the slow improvement of traffic

TRANSACTIONS ON SCIENCE AND TECHNOLOGY

facilities in keeping up with the population demand (Abdullah & Kien Hua, 2017). Kota Kinabalu relies heavily on public buses for commuting especially buses that operate locally. Currently, there are two (2) types of public buses that operates around the city which include minibus and transit bus. This study investigates the issue of public transportation in Kota Kinabalu, Sabah based on quality of service and bus stop condition.

## METHODOLOGY

In this study, two (2) methods of data collection were used which includes site observation and survey questionnaire. At the beginning of the research, site observation was used to collect preliminary data based on the pictures taken as well as to feel the actual situation of the problem to be studied. Site observations were conducted in bus stations around Kota Kinabalu during peak hours (8am to 10am and 5pm to 7pm) to observe passenger as they board public transport and use bus stop facilities. During the observation focuses on the convenience of public transport users public transport conditions, bus stops and bus terminals. Other factors such as information of public transport users, fare prices, public transport routes were also recorded. This information was used to develop more meaningful questions for the questionnaire and interview guide.

Survey questionnaire was design based on findings from literature review as well as observation around Kota Kinabalu city. About 460) survey questionnaires were distributed to passengers of public bus around Kota Kinabalu city. Responses gathered through questionnaire were analyse using Statistical Package for the Social Sciences (SPSS) software version 26. Through this questionnaire, the passenger's opinion on public bus quality attributes were evaluated. The attributes include route planning, walking distance to bus stop, bus fare, bus scheduling, punctuality, waiting time, frequency of bus, comfort, cleanliness, safety and transfer or interchanges. Passenger's level of satisfaction for each quality attribute were measure using four-point Likert scale; 1- Very Poor, 2- Poor, 3- Good and 4- Very good.

## RESULT AND DISCUSSION

*Demographic of respondent*

**Table 1.** Respondents' Demographic

| Respondents' Demographic Profile | | | | |
|---|---|---|---|---|
| **Gender** | | | | |
| **Male** | | **Female** | | |
| 48.5% | | 51.5% | | |
| **Age** | | | | |
| **20-24 years old** | **25-40 years old** | **41-55 years old** | **>56 years old** | |
| 26.5% | 66.3% | 5.7% | 1.5% | |
| **Education** | | | | |
| **SPM/STPM/Diploma** | **Degree** | **Master** | **PhD** | |
| 72.2% | 27.4% | 0.7% | 0.4% | |
| **Occupation** | | | | |
| **Government** | **Private Sector** | **Self-employed** | **Student** | |
| 7.8% | 76.1% | 4.1% | 12% | |
| **Income** | | | | |
| **< RM500** | **RM501 - 1,000** | **RM1,001 - 2,000** | **RM2,001 - 4,000** | **>RM4,001** |
| 5.9% | 55.9% | 30.7% | 7.0% | 0.7% |

Socio demographic analysis is related to the study of population. In this research, demographic analysis conducted to provides the overview of demographic characteristics of the respondents. Based on the survey, a total 460 set of questionnaires were distributed to the public bus users around the study area. The questionnaires forms are randomly distributed to public bus user. The overall sets of questionnaires are completely distributed within three months. The data covers respondents' gender, age, education level, occupation and income. Demographic data were analysed using descriptive analysis and summaries in Table 1.

*Analysis of Public Bus Service Quality*

Passenger opinion on the public bus quality attributes were measured using Likert scale. Table 2 show the summary of responses according to percentage score. From the result it shows that the public are highly satisfied with the current public bus fare with 81% of the respondent think that the current fare rate is good. It is also found that respondents are generally satisfied with the cleanliness of the buses as well as safety during the journey.

Meanwhile, passengers are dissatisfied with the 7 other attributes where these attributes were shown to be poor and very poor which include transfer/interchanges, bus schedule, waiting time, walking distance, route planning, comfort, and punctuality. Hence, it can be summarized that the public perceived the quality of bus services in Kota Kinabalu as poor.

Among the 7 attributes that perceived as poor by the public, transfer/interchanges score the highest percentage. Through observation, it is found that there are no proper system and facilities for users to make transfer. This causes inconvenience for passenger and disrupt passenger's travel. Establishment of transfer mechanism especially between mode will greatly improve the level of service for public bus.

**Table 2.** Summary on Passenger's Responses on Public Bus Service Quality

| No | Attributes | Respondent's Feedback | Percentage |
|----|------------|----------------------|------------|
| 1 | Public Bus Fare | Good | 80.87 |
| 2 | Cleanliness of Public Bus | Good | 67.17 |
| 3 | Safety during the journey | Good | 73.48 |
| 4 | Transfer (Interchange) | Poor | 88.70 |
| 5 | Bus Trip Schedule | Poor | 82.61 |
| 6 | Waiting time | Poor | 80.87 |
| 7 | Walking distance | Poor | 79.5 |
| 8 | Route planning | Poor | 73.26 |
| 9 | Comfort during the journey | Very Poor | 62.39 |
| 10 | Punctuality | Very Poor | 52 |

Initial reliability test was run for the public bus services quality construct. In this construct, there are 10 items measured using Likert scale. Each item represents one aspect of public bus quality. Reliability test using Cronbach Alpha provide a measure of internal consistency of a test or a scale. Internal consistency describes the extent to which all the items in a test measure the same concept or construct (Tavakol and Dennick, 2011).

**Table 3.** Reliability Test

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|---------------------------------------------|------------|
| .380 | .421 | 10 |

From the analysis, the result of the reliability test is shown in Table 3. It shows that the alpha for this construct is 0.380. This result is much lower from the recommended figure which is above 0.7. However, the construct is maintained for this research. One of the possible reasons behind the low alpha is the length of test. According to Tavakol & Dennick (2011), short test will decrease the value of alpha. In this questionnaire, the test is considered as short with only one construct to measure one dimension. Apart from that it is also important to note that alpha is a property of the scores on a test from a specific sample of testers. The respondent of the survey consists of people from different walk of life which commute using various bus line available in Kota Kinabalu. This resulted in various result where one respondent may respond very poor in one item while respond very good in different item which measure public bus quality. The variety in responses will reduce the overall internal consistency of the test and give low Cronbach alpha.

**Table 4.** Mean Distribution of Mean of Public Bus Service Quality according to Age Group

| Age Group | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| 20-24 years | 122 | 2.2352 | 0.212 | 1.4 | 2.9 |
| 25-40 years | 305 | 2.257 | 0.17194 | 1.5 | 2.9 |
| 41-55 years | 26 | 2.1538 | 0.25959 | 1.4 | 2.6 |
| > 56 years old | 7 | 2.0286 | 0.34017 | 1.4 | 2.3 |
| **Total** | 460 | 2.242 | 0.1947 | 1.4 | 2.9 |

**Table 5.** One Way ANOVA Test Result for Mean of Public Bus Service Quality between age group

| Mean Quality | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 0.596 | 3 | 0.199 | 5.387 | 0.001 |
| Within Groups | 16.805 | 456 | 0.037 | | |
| **Total** | **17.4** | **459** | | | |

In order to analyse the perception of the people on the quality of public bus service, descriptive analysis and one-way analysis of variance (ANOVA) were run to compare means between different groups (Table 4 and Table 5). Based on result in Table 4.0, there are significant difference in public bus service quality mean score based on the difference in age group (F=5.387, p<0.05). According to the result, the perception of public bus service quality is higher among the age group 20-24 (M=2.2352) and 25-40 (M=2.2570). Quality perception among users is lower among the age group 41-55 (M= 2.1538) and 56 and above (M=2.0286). Although the ANOVA result is statistically significant, the difference in score mean among age group are consider small. The size effect calculated using ETA Squared is 0.034. From the result, it can be elicited that the perceptions of public bus service quality are influenced by the age group of the passenger. This finding is supported by other studies where factors that influence the quality of public transportation services are often related to age (Ibrahim *et al.,* 2021; Morton *et al.,* 2016). In this study, it shows that the quality of public transportation decreases as the age of the passenger increase. This is parallel with the finding from study done by Noor *et al.* (2014) where elder passenger is dissatisfied with the lack of facilities for elderly in buses and bus stops. This shows that current bus service cause discomfort among older users.

Tables 6 and 7 present the means score of public bus service and ANOVA of public bus service quality according to frequency usage. Based on the analysis conducted, the quality of public transport services affects the age factor where the age of 56 years and above is relatively less using public transport may be due to uncomfortable public bus conditions. While the age group of 25-40 years old higher users use public transport.

TRANSACTIONS ON SCIENCE AND TECHNOLOGY

**Table 6.** Mean Score of Public Bus Service Quality according to Frequency Usage

| Frequency | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Daily | 318 | 2.2283 | 0.17022 | 1.4 | 2.7 |
| Several times a week | 101 | 2.297 | 0.2193 | 1.8 | 2.9 |
| Weekly | 33 | 2.1667 | 0.27234 | 1.7 | 2.6 |
| Several times a month | 8 | 2.4 | 0.2 | 2 | 2.7 |
| **Total** | **460** | **2.242** | **0.1947** | **1.4** | **2.9** |

Table 7 present the significant difference in public bus service quality mean score based on the difference in bus usage frequency (F=6.871, p<0.05). The mean score of bus users that take the bus several times a week (M= 2.2970) and several times a month (M=2.4000) are higher than users that take the bus daily (M=2.2283) and weekly (M=2.1667). Although the ANOVA result is statistically significant, the difference in score mean among age group are consider small where n2 < 0.06. The size effect calculated using ETA Squared is 0.043.

**Table 7.** One Way ANOVA Test Result for Mean of Public Bus Service Quality according to Usage Frequency.

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| **Between Groups** | 0.753 | 3 | 0.251 | 6.871 | 0.00 |
| **Within Groups** | 16.648 | 456 | 0.037 | | |
| **Total** | **17.4** | **459** | | | |

**Table 8.** Mean Score of Public Bus Service Quality according to Trip Origin

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| KK | 82 | 2.268 | 0.14391 | 1.7 | 2.6 |
| Putatan | 59 | 2.18 | 0.24338 | 1.4 | 2.6 |
| Kepayan | 63 | 2.24 | 0.1409 | 1.8 | 2.7 |
| Lintas | 27 | 2.267 | 0.09199 | 2.1 | 2.5 |
| Luyang | 25 | 2.212 | 0.18556 | 1.4 | 2.4 |
| Likas | 36 | 2.444 | 0.20763 | 2 | 2.8 |
| Inanam | 27 | 2.119 | 0.24501 | 1.7 | 2.4 |
| UMS/1Borneo | 34 | 2.232 | 0.09445 | 2.1 | 2.4 |
| Menggatal | 28 | 2.246 | 0.18152 | 1.9 | 2.6 |
| Indah permai | 15 | 2.36 | 0.30426 | 2 | 2.9 |
| Taman Jaya Diri/sepanggar | 11 | 2.246 | 0.28413 | 1.5 | 2.6 |
| Bandar sierra | 24 | 2.133 | 0.13077 | 2 | 2.6 |
| Telipok | 28 | 2.211 | 0.12274 | 1.8 | 2.3 |
| Penampang | 1 | 1.9 | . | 1.9 | 1.9 |
| **Total** | **460** | **2.242** | **0.1947** | **1.4** | **2.9** |

**Table 9.** One Way ANOVA Test Result for Mean of Public Bus Service Quality according to Trip Origin

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| **Between Groups** | 2.853 | 13 | 0.219 | 6.728 | 0.00 |
| **Within Groups** | 14.547 | 446 | 0.033 | | |
| **Total** | **17.4** | **459** | | | |

Table 8.0 shows that there is significant difference in the in public bus service quality mean score based on the passenger origin of trip. Perception on public bus quality differs according to places where there is unbalance focus in quality of public bus services. According to mean score, the origin with the highest mean score is Likas (M=2.445) followed by Indah Permai (M=2.360) and Kota Kinabalu (M=2.268). In contrary, the three origins with the lowest mean score are Penampang (M=1.900), Inanam (M=2.1185) and Bandar Sierra (M=2.1333).

From the result, it can be elicited that quality of public bus services differs according to areas and bus line. It shows that there are imbalances in focus of quality service provision where better quality of service can be found near to the CBD such as Kota Kinabalu and Likas. As the population increases as it gets closer to the city, there are higher number of public bus users in these areas. In Table 9.0, the calculation of ETA Squared > 0.14 (0.164), hence effect size of trip of origin towards public bus services quality are consider large.

*Existing Bus Stop Condition*
Figure 1 shows the result of passenger's responses on the current condition of the existing bus terminal in Kota Kinabalu. Based on the result, majority of the respondent are dissatisfied with the current state of existing bus stop where more than 80% of the respondent answer both poor and very poor. Meanwhile only 6.5% of respondent rated good and 3.0% of respondents rated the condition of the bus stop as very good.
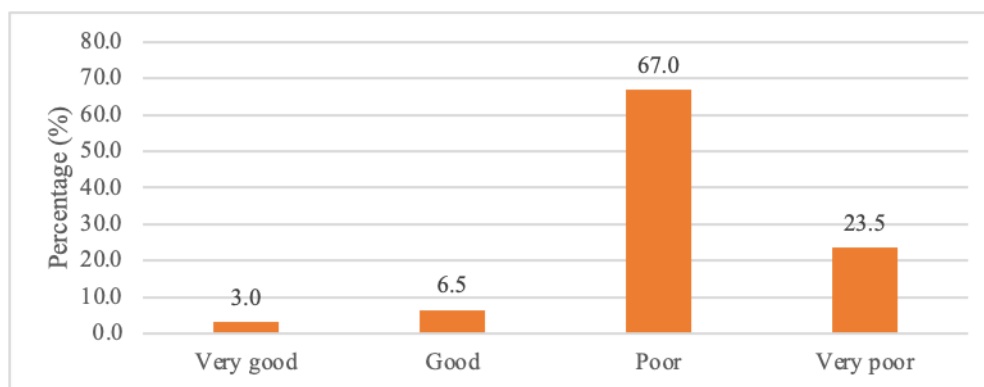


**Figure 1.** Current condition of the existing bus terminal in Kota Kinabalu

According to the respondent, current condition of bus stops and terminals in Kota Kinabalu are unsatisfactory. From site observation, there are lack of planning in locating bus stops around Kota Kinabalu. There are insufficient provision of bus stops especially outside the CBD area causing bus operator to drop on and off passengers at random spots. This practice is dangerous not only for bus users but also for the public road users such as pedestrians and drivers.

Apart from that, current bus stops condition is mostly in poor condition, old and dilapidated. For example, in Figure 2 shows bus stop without proper seating area for the passengers as well as information board on public bus services. There is no formal information on what bus pass by certain bus stops and what line do it serves.

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**Figure 2.** Improper bus stop design and conditions in Kota Kinabalu city

## CONCLUSION

From the analysis and discussion, it shows that public bus users are highly dissatisfied with current public bus system in Kota Kinabalu. The results show that the overall bus system is disconnected where aspects such as bus routes, provision of bus stops, bus scheduling, transfers, public bus infrastructure and amenities are poorly planned and managed. The findings also indicate that the condition of public bus stops in Kota Kinabalu is unsatisfactory. Current bus stops are insufficient and lacking in maintenance causing discomfort among public bus users especially among elder users. Hence, there is a need for improvements on the overall public bus system to ensure high quality service can be delivered to the public.

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