



THE EFFECTIVENESS OF UNPERMITTED BUS SERVICES (*PIRATE*) TRANSPORTATION MODE



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ABSTRACT

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Informal transportation services are often associated with safety risks, as the use of old vehicles in poor condition does not guarantee the safety and comfort of users. Currently, existing public transportation services in Kota Kinabalu does not cover the entire city area, which has led to the existence of informal public transportation mode, namely unpermitted busses to meet users' demand. The purpose of this study was to assess user acceptance of unpermitted bus services in Kota Kinabalu, Sabah. A survey was done using a questionnaire as an instrument among 140 respondents. The results show that three factors of service effectiveness achieved a high mean score, namely the fare factor (3.82), the reliability factor (3.75), and the accessibility factor (3.69). This study shows that unpermitted bus services play an important role, especially in providing mobility services to users, although drivers do not emphasize the safety and comfort aspects of this mode.

Contribution/ Originality: The current work clearly proves that the role of the unpermitted bus in Kota Kinabalu is crucial in the context of providing transportation facilities in some locations that lack of access to the formal public transportation. Thus, all responsible stakeholders, especially the Commercial Vehicle Licensing Board of Sabah, Road Transport Department and local authorities needs formulating more effective policies and strategies related to the informal public transport services in Kota Kinabalu.

1. INTRODUCTION

Informal transportation services are becoming a 'global phenomenon' that plays a significant role in the mobility of millions of urban dwellers, particularly in the global south [1]. In this regard, informal transportation provides much-needed services to users, particularly in areas where formal public transportation is unavailable. According to Manwaring and Wani [2], operators of this informal mode typically provide a wider network of connectivity than formal networks, offer better services in low-income areas and are highly responsive to market demand. In India, for example, where the urban population is approximately 377 million people living in 7,935 cities and towns (as of 2011), bus and train services are only available in 65 cities [3]. Meanwhile, to meet the needs for mobility, all other cities in the country rely on walking, cycling, non-motorized transportation, private vehicles, and informal public transportation. Similarly, informal transportation mode accounts for 60% of transportation supply

in Kayseri, Turkey, and up to 90% in many African cities. This clearly shows that the sector meets the shortage of formal transportation services in developing urban areas as well as due to increased needs for mobility, the growth of the upper middle class, and new technologies that have enabled new services [1].

Meanwhile, the existing public transportation system, both globally and locally, frequently faces issues regarding the supply of existing public transportation services and their ineffectiveness [4]. At the local level, a study by Mazdi, et al. [5] discovered that the absence of formal public transportation used by the people in Hulu Terengganu forces residents in the area to rely on informal public transportation. The rise of "illegal" school van services due to the very limited number of registered school buses or vans [6]. As a result, various forms of informal transportation have emerged to fill the gap between private and public modes of transportation caused by the public transportation system's inefficiency to meet the need for transportation that exceeds the demand for transportation services [3, 7]. A similar scenario can also be seen when public transportation in Kota Kinabalu is currently at an unsatisfactory level [8]. In this regard, public bus services in Kota Kinabalu are limited, as the majority of their operations are focused on transporting passengers from suburban towns to the city center [4]. As a result, the need for public transportation services is intensifying. This is due to the fact that users in certain areas who live in villages or new housing estates are unable to access mobility facilities because the public bus services connecting villages and residential areas to towns or city centers are still scarce and relatively limited [9]. This resulted in the existence of informal services, which are unpermitted buses known as *van sapu* (sweep vans) or "pirates." This informal mode of transportation refers to the informally operated service sector that does not have a permit to operate officially as public transportation. These unpermitted buses operate illegally without permission from the authorities and will pick up passengers on a number of specific routes as they please. Without the convenience of this mode, users will not be able to travel, especially for those who do not own a private vehicle and do not have access to public buses [5]. However, these informal mode of transportation services are often associated with comfort and safety issues. This mode of service operates at a high risk of road accidents due to the use of vehicles that are old, dilapidated, unmanaged, overloaded, and do not meet public transportation standards [10]. For example, it is believed that the physical condition of a bus that appears to be dilapidated with 'bald' tires does not guarantee the safety and comfort of users and contributes risks to passengers. The risk referred to is the absence of compensation in the event of a road accident because the van operator does not take any insurance for users [5]. Therefore, this study aimed to see how the operation of unpermitted bus services plays a significant role to the community, especially in terms of transportation mobility facilities. In this respect, an evaluation on the effectiveness of unpermitted bus services transportation mode was done to determine the user acceptance level towards the services of that particular mode. According to Harifah, et al. [11], the role of transportation is measured through the effectiveness of its services, where the higher the level of effectiveness, the stronger its role is in providing services to users. This also indicates that users willingly accept the presence of such transportation services and that it definitely poses a great impact on them, especially in meeting their needs for transportation mobility facilities.

2. LITERATURE REVIEW

Most paratransit services in developing countries are classified as informal transportation and are poorly managed [12, 13]. In this regard, each country has a different type of informal transportation mode with different names and its own service characteristics, where the services are not in line with the formal public transportation system. However, the importance of paratransit services as one of the transportation modes for users should not be overlooked [7]. According to Cervero [12], most public transportation operators only exist as protected monopolies, are only interested in gaining profit, and do not provide good services to users. As a result, these informal transportation services are better known for their role as gap fillers because they exist in some locations where access to formal public transportation is unavailable [12].

In the meantime, several studies on informal transportation (paratransit) services have been conducted by previous scholars. In a study by Joewono and Kubota [14], several binomial logistic regression models were developed based on people's perceptions towards service quality, vehicle quality, driver quality, and fares. The models describe key characteristics and variables for determining whether people will use more paratransit in the future once improvements have been made, and highlight the existence of existing user facts that rely heavily on this mode. Furthermore, the models describe the potential for a mode shift to this mode following the implementation of some improvements. A study conducted by Joewono and Kubota [15] revealed that community groups clearly want to continue using paratransit, which proves that the future of paratransit has great potential, particularly in providing transportation services to users. In addition to that, Joewono and Kubota [16] also concluded in their study that paratransit services should be able to meet the needs of users so that they remain the chosen mode among users in the future. The level of user satisfaction with paratransit services must be considered in order to predict the future implications when competition with motor vehicles occurs in Bandung, Indonesia.

A study by Nwaogbe, et al. [17] focused on the quality of paratransit services and their operations in the Aba area, Nigeria. Hypothesis testing was used to examine the community's feelings about the characteristics of the services provided to paratransit users, such as affordability, orderliness, comfort, and safety. The results revealed that there was no significant difference between the various categories of respondents at the 5% level. Meanwhile, a study by Phun, et al. [18] highlighted that the continuity of paratransit services in developing Asian cities is solely dependent on user perception and level of acceptance. Therefore, the researcher investigated the characteristics and perceptions of Phnom Penh's paratransit users, specifically the *Motodop* and *Remork* modes. Furthermore, a study by Farzana, et al. [18] investigated user perceptions on the quality of paratransit services in Dhaka, Bangladesh, and discovered that paratransit services were users' preferred mode of transportation. However, the services offered were out of date and did not meet the quality that users had come to expect. Mazdi, et al. [5] also applied the same approach as previous scholars, that is to assess user perceptions on the quality of paid private van transportation services in the rural area of Hulu Terengganu. Based on the findings of the study, several proposals were made to further strengthen van services in the area so that users could use more comfortable and safe transportation mobility facilities. In addition, a study by Phun, et al. [10] explored the issue of paratransit safety in developing Asian cities, as this mode of service is believed to often operate under the risk of road accidents. This is because dangerous driving behaviors and the use of old, poorly maintained, overused, and not up-to-standard vehicles are highly risky. Overall, previous scholars explored consumer perceptions of informal transportation services by describing several aspects related to the quality of the mode of service used. Harifah [8] explained that perception is an impression towards the practices, manners, way of life, and other communities' acceptance towards them. In the meantime, considering user perceptions is fundamental because users' point of view is highly relevant in evaluating the performance of transportation services [19]. Therefore, by evaluating user perception, not only can users' needs be determined, but transportation services can also be improved towards a more positive direction. Previous studies have gathered a wealth of important facts to help clarify issues surrounding informal transportation operations while also taking into account the perceptions of the community who tend to use the mode. In the context of this study, user perceptions were used to evaluate the level of user acceptance towards unpermitted bus services in Kota Kinabalu. In this regard, the researcher would like to see how the operation of unpermitted bus services plays an important role for the community, especially in terms of transportation mobility facilities.

2.1. Measuring the Effectiveness of Public Transportation Services

Eboli and Mazzulla [19] stated that user perception is the basic information that needs to be considered because the user's point of view is highly relevant in evaluating the performance of transportation services. Figure 1 illustrates the measuring of the effectiveness of public transportation services contains five factors: comfort,

reliability, safety, accessibility, and fare factors. Behal, et al. [20] also pointed out that user surveys will help set the required weights for five different parameters, namely reliability, walkability, and safety inside and outside the vehicle.

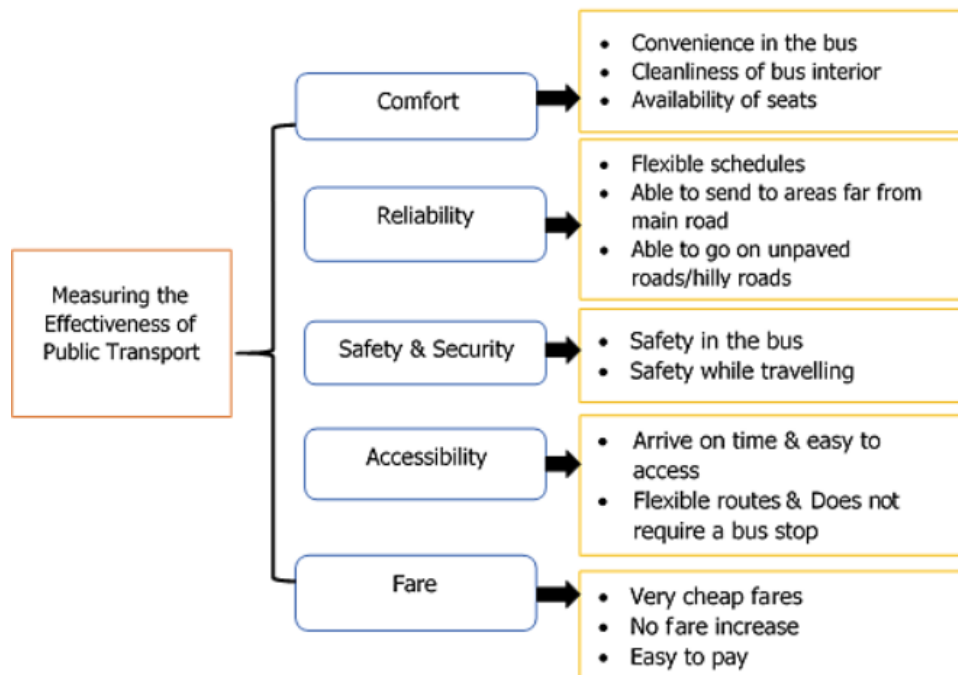


Figure 1. Models for measuring the effectiveness of public transport services.
Source: Modified from Eboli and Mazzulla [19]; Harifah, et al. [11].

Comfort and cleanliness are important components in ensuring that users are satisfied with the quality of services provided by taking into account comfort while in the transportation mode and comfort at the bus stop [5, 19]. Harifah, et al. [11] also explained that feeling comfortable while travelling is important for users, whether it is physical, such as the condition of the vehicle, or comfortable with the surrounding conditions, such as at the bus terminal, bus stop, or inside the bus. There are four indicators for measuring the aspects of comfort, namely internal cleanliness, seats, and windows; the external cleanliness of vehicles; the condition of the vehicle seat; and the condition of the transport's engine [19, 21]. Olowosegun, et al. [22] stated that users' well-being will also be affected when their comfort is compromised while using transportation services, specifically seat comfort and seat availability.

Next, the reliability aspect is a dimension that looks at the reliability of public transportation services in ensuring passengers are transported to their destination, and it involves the ability of a transportation service system to adhere to a schedule, which is the ability of vehicles to depart or arrive on time [19, 21]. Among the important aspects considered in the reliability dimension are the number of public transportation vehicles, waiting time, travel time, and consistency of public transportation services when transporting passengers to their destinations. In addition, according to Olowosegun, et al. [22], the challenges of reliability and safety are associated with issues related to overloading, the use of vehicles that do not pass road fitness tests, and blatant violations of traffic rules. In this case, vehicle speed is one of the aspects that can influence the reliability of public transportation services.

Safety factor includes safety from crime and accidents or psychological effects from the environment, either while riding public transport or waiting at a bus stop [11, 19]. For example, the physical condition of the bus used, which is dilapidated and unsafe, will cause users to feel unsafe and vulnerable to the risk of accidents while on the

road. A study by Behal, et al. [20] also discovered that users of informal transportation services prioritize safety over comfort and convenience when at a bus stop and while riding in that mode.

As for the accessibility factor, Eboli and Mazzulla [19] took into account bus speed when evaluating the accessibility factor, the same opinion expressed by Farzana, et al. [18], who stated that the speed of paratransit vehicles is one of the key factors that influence users to choose paratransit services. Meanwhile, Harifah, et al. [11] defined accessibility for road users as the ability for users to quickly and easily reach a destination, which involves the total number of service routes, comprehensive service coverage, and no vehicle interchanges. A study by Olowosegun, et al. [22] emphasizes the aspect of accessibility in the evaluation of quality of service (QoS) by taking both origin and destination accessibility into account. Therefore, the assumed quality of service should reach 50 percent based on the average quality of service evaluation (AQoSE).

Finally, the fare factor is one of the components that users really take into account, as public transportation services typically offer affordable and lower than normal prices [5]. This aims to facilitate individuals who do not have a private vehicle to travel from one location to another and indirectly, it becomes an important element in improving user reliability to continue using public transportation services [11]. A study by Venter, et al. [23] discovered that the fare rate charged to passengers would increase if drivers operated in areas with damaged and unpaved road conditions. Meanwhile, road conditions affect the quantity and quality of public transportation services provided, as well as the fares charged to passengers.

Therefore, the measurement of the effectiveness of public transportation services is applied to assess the level of user acceptance of informal public transportation services in Kota Kinabalu. It is hoped that the findings of this study can help stakeholders to take effective measures in improving formal public transportation services in Kota Kinabalu, without discounting the importance of informal mode of transportation which exist as a backup support in some areas not accessible by public transportation, as stated by Mazdi, et al. [5].

3. STUDY METHODOLOGY

The survey method was performed using a survey form. The sample size consisted of 140 respondents who used unpermitted bus transportation mode in Inanam, Menggatal, and Telipok. The sample size used is in line with the rule of thumb established by Roscoe [24], who stated that a sample size of 30 to 500 people is suitable for most studies, especially when the total population is unknown. A specific purposive sampling method was used in this study on the users of unpermitted bus services, justified by the fact that the total population of users using this service was not able to be identified as there was no specific data available from the Department of Statistics Malaysia. Therefore, the selection of respondents was done purposively involving a group of subjects with certain characteristics to be selected as study respondents [25]. A structured interview with an officer of the Commercial Vehicle Licensing Board (CVLB) was also conducted to strengthen the study findings on several issues related to this study. The study data was analyzed using descriptive statistical analysis, namely frequency, percentage, and mean value. The mean score indicator developed by Jamil [26] Table 1 was used in the study for mean score analysis. Meanwhile, data obtained from the structured interview were analyzed using literal analysis, with an emphasis on the aspects of words and language used, form and structure of dialogue, and literal content to describe the actual meaning that the informant intended to convey [27].

Table 1. Interpretation of mean scores.

| Mean Score Index | Category (Level) | Interpretation |
|------------------|------------------|----------------|
| 1.33 to 2.33 | Low | Disagree |
| 2.34 to 3.66 | Moderate | Agree |
| 3.67 to 5.00 | High | Strongly agree |

Source: Jamil [26].

3.1. Study Area

The study was conducted in the district of Kota Kinabalu, Sabah. Kota Kinabalu is the capital of Sabah and is located at a geographical position of $116^{\circ} 2' 0'' - 116^{\circ} 15' 30''$ E longitude and $5^{\circ} 52' 30'' - 6^{\circ} 4' 30''$ N latitude on the South West Coast (Figure 2.). Kota Kinabalu has an area of 351 km² with a population of 462,963 people in 2010, which consists of various races and ethnicities such as Bajau, Malay, Kadazan, Dusun, Murut, Chinese, Indian, and others [28]. However, the population of the Kota Kinabalu district has now increased to 553,900 people [29]. The Kota Kinabalu district is also the largest city in the state of Sabah and serves as the main gateway to the Borneo archipelago, where the international airport is located eight kilometers away from the city center [4].

The study location encompasses several sub-districts of Kota Kinabalu, namely Inanam, Manggatal, and Telipok which are located in the northern part of Kota Kinabalu. The selection of these three sub-districts as the study location was justified by the fact that the operation of unpermitted buses in the area was very dominant in terms of its use. A pilot study was conducted to identify the locations where unpermitted buses were operating. The pilot study discovered that there were complaints from users and drivers of public buses operating in these three locations. Furthermore, services connecting village and housing areas to towns or town centers were still lacking, making it difficult for users in certain areas, such that experienced by public transportation users in Telipok, Manggatal, and Inanam, some of whom lived in villages or housing estates [4]. Therefore, the researcher selected these three sub-districts as the locations to collect questionnaire data.

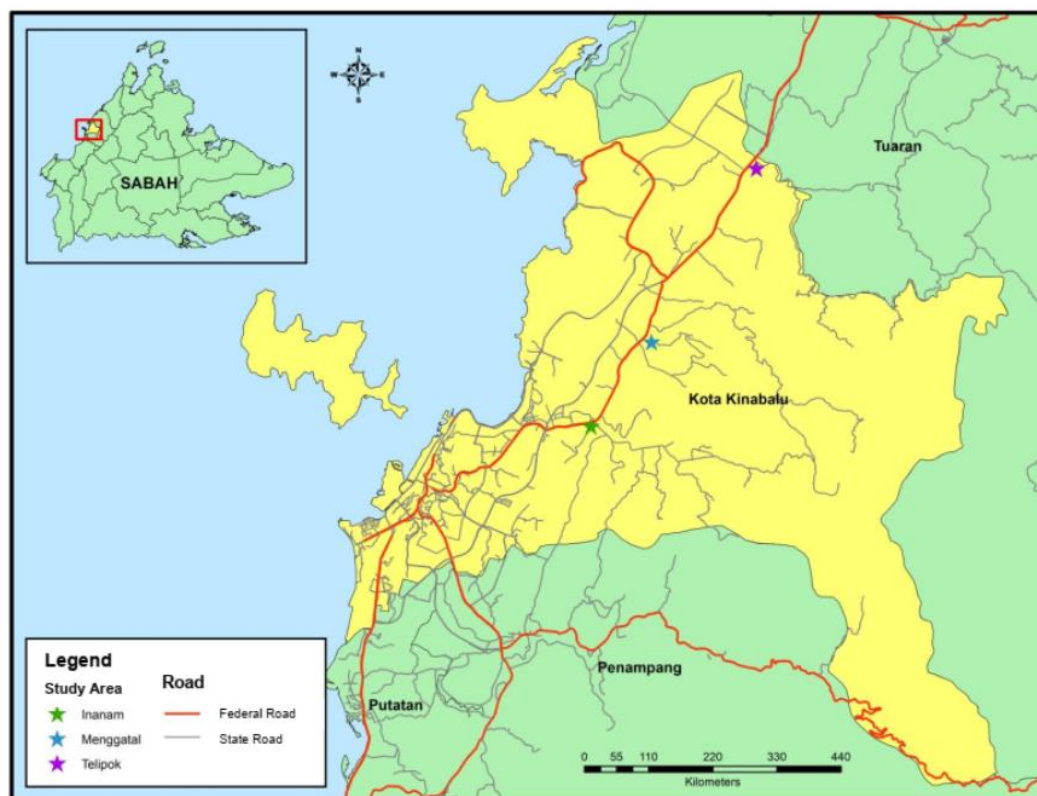


Figure 2. Illustrates of study area.

Source: Modified from Department of Survey and Mapping Malaysia (JUPEM).

4. FINDINGS

4.1. Demographic Profile

Table 2 provides a summary of the demographics of the respondents who are unpermitted bus service users. The majority of respondents (60%) were female, with 40 percent being male. In terms of age, 55% of users were in the range of 21–30 years old, while only 5% were between the ages of 51 and above. The age group of 20 years and below accounted for 14% of users, with another 16 percent being those in the range of 31–40 years old. This is

followed by 10% of users who were 41–50 years old. Therefore, it can be concluded that the majority of respondents were 21–30 years old, while the lowest were those in the 51 and above age group.

According to Table 2, the majority (62%) of users are single, while only 34% of users are married, followed by 4% of users who are widowed. In addition, the findings showed that 89% of users are Malaysian citizens and only 11% of users are non-citizens from the Philippines and Indonesia. In addition, Table 2 also displays the distribution of respondents by race, where it can be seen that the majority (49%) of users are Bajau, while the minority (7%) are Bugis and (6%) are Malays. From the results of the study, it is also discovered that 46% of respondents have a secondary level of education, while 2% of respondents have no education, which means they have never attended school. This is followed by diploma and lower level education with 22% and 19% of respondents, respectively. In addition, another 11% of respondents have a degree level of education.

In terms of employment status, 59% of respondents are full-time employees, 14% are part-time employees, and the remaining 27% are unemployed, whether retired or not yet working Table 2. As for the type of employment, the majority of respondents (59%) work in the private sector, which includes jobs such as clerks, cashiers, salespeople, security guards, bus drivers, contractors, and others. Other categories comprised of 23% of respondents who are students and housewives. Respondents working in the government sector only recorded 4% of respondents, which consists of teachers and civil servants. In addition, there were a number of self-employed respondents (10%), consisting of traders, fishermen, and farmers. However, the findings also showed that the remaining 4% of respondents are unemployed.

Table 2. Demographic profile of the respondents.

| Demography of the Respondents | Percentage (%) |
|---|---|
| Sex | Male (40), Female (60) |
| Age | < 20 years old (14), 21-30 years old (50), 31-40 years old (16), 41-50 years old (10), 51 years old and above (5) |
| Marital Status | Single (62), Married (34), Widower/Widow (4) |
| Citizenship | Citizen (89), Non Citizen (11) |
| Race | Bajau (49), Dusun (15), Bugis (7), Malay (6), Others (23) |
| Level of Education | Primary (19), Secondary (46), Diploma (22), Degree (11), Others (2) |
| Employment Status | Working Full-time (59), Working Part-time (14), Unemployed (retired/not yet working) (27) |
| Type of Employment | Government (4), Private (59), Self-employed (10), Unemployed (4), Others (23) |
| Head of Household Income (Gross Budget Per Month) | RM800 and below (14), RM801 - RM1500 (66), RM1501-RM2000 (12), RM2001 - RM2500 (6), RM2501 - RM3000 (1), RM3001 and above (1) |

In addition, the findings of the study showed that a large number of respondents (66%) have a household income of RM801-RM1500, followed by a household income of RM800 and below, which accounts for 14% of the respondents. Meanwhile, respondents with household incomes of RM2501-RM3000 and RM3001 and above each recorded 1% of respondents. The rest have a household income of RM1501-RM2000 and RM2001-RM2500, each accounting for 12% and 6% of respondents.

4.2. Factors Influencing the Effectiveness of Unpermitted Bus Services

Based on Table 3, the fare factor achieved the highest average mean score of 3.82. The easy-to-pay (mean=4.10) and fares based on the area travelled (mean=4.07) variables make unpermitted bus services have a place in the hearts of users. However, the no fare increase variable recorded the lowest mean value of 3.30, owing to the fact that some unpermitted bus drivers charge higher fares during the festive season, such as Aidilfitri and Christmas days. Moreover, the fare rate will also be doubled from the original fare if a user requests to be sent straight to their

home. In the Manggatal area, for example, users who request to be sent to a location away from the main road will be charged a fare of RM5.00–RM10.00. Therefore, the fare charged by the drivers of unpermitted buses is uncontrollable, as explained by Informant (1) below:

“...its effects towards, towards entrepreneurs who do have permits..so in terms of the number of passengers and income, they will decrease..and then towards the passengers or the public because for those with permits, we already have a standardized fare rate..The fare rate that has been set by CVLB..So those without permits, they will charge the fare rate as they please...”

(Informant 1: Director of CVLB Sabah)

Informant (1) stated that the drivers of unpermitted buses were charging different fares to users as they please. This situation will create competition for operators who have permits in terms of getting passengers and will decrease their income.

Next, the reliability factor recorded the second highest mean score of 3.75, indicating that users are satisfied with the unpermitted bus services, such as sending them to areas far from the main road, able to go on unpaved roads, able to go on hilly roads, and not tied to any schedule. Following that is the accessibility factor, with an average mean score of 3.69, indicating that the unpermitted bus services are able to compete with public transportation services. This is due to the fact that users opt to use the service in this mode because it is easily available and not bound to any particular route (free route). However, the timely arrival (mean=3.46) variable recorded the lowest mean value among the other accessibility variables, owing to relatively slow bus movement due to poor bus conditions as well as adhering to the rules of the bus rotation system that had been set. As such, the punctuality of picking up passengers is fairly unsatisfactory for passengers who have to wait for all seats to be filled before the bus can depart.

In addition, the comfort factor recorded the second lowest mean score of 3.37, with the lowest variable being suitable for the elderly (mean=3.01). This is based on observations discovered by the researcher that some unpermitted buses operating are in a condition (design) where they have become obsolete and should not be used to transport passengers, the poor condition of the buses makes the seats uncomfortable to sit in and they are insufficient in number. Therefore, the crowded and cramped environment in the bus is inappropriate for the elderly, especially those with health issues such as shortness of breath.

While the safety factor is the lowest factor in the effectiveness of unpermitted bus services with an average mean score of 3.29, and the lowest contributing variable is the safe structure of the bus/van used and the drivers' compliance with the rules while operating. According to field observations, the majority of the buses/vans used to operate were in unsafe physical condition (design), and the buses had exceeded the age limit of 25 years and were old. Thus, it is not surprising that the bus/van structure variable recorded the lowest mean. In addition, according to Mazdi, et al. [5], paratransit vehicles have a number of safety issues, including questionable licensing, unskilled drivers, and uninsured services. Thus, the attribute of drivers operating within the rules contributed to the lowest average mean. In this regard, there are a few drivers of unpermitted buses who do not have a car driving license and a license to drive a bus (a PSV license), so they often drive in situations that endanger the safety of passengers. For example, they often exceed the speed limits because they want to get the passengers to the destination as quickly as possible so that they can return to the bus stop for the next load of passengers. A description from Informant (1):

“...because compared to vehicles that have a permit, we require them to have a PSV license, which is permission to carry passengers and in order to get the license, the driver must take a course to be qualified or to pass a PSV license.. Compared to those without a permit, so there are drivers who don't even have a license, that's one.. so the risk from their driving skills, drivers who don't have a permit for example, defensive driving skill..so if there is an emergency what action should the driver take..he needs to swing to the right or swing to the left or just hit...”

(Informant 1: Director of CVLB Sabah)

As explained by the director of CVLB (Informant 1), most drivers of unpermitted buses do not have a public service vehicle (PSV) driving license, which means owning the license allows drivers to carry passengers and they are required to take a course to qualify for a PSV license.

Table 3. Factors influencing the effectiveness of unpermitted bus services in Kota Kinabalu.

| Factors influencing the effectiveness of unpermitted bus services | Attribute | Mean Value | Average |
|---|--|------------|---------|
| Fare Factor | Very cheap fares | 3.82 | 3.82 |
| | Easy to pay | 4.1 | |
| | No fare increase | 3.3 | |
| | Fares based on the area traveled | 4.07 | |
| Reliability Factor | Not tied to any schedule | 3.53 | 3.75 |
| | Able to go on unpaved roads | 3.8 | |
| | Able to go on hilly roads | 3.71 | |
| | Able to send to areas far from the main road | 3.98 | |
| Accessibility Factor | Timely arrival | 3.46 | 3.69 |
| | Not bound to any particular route (free route) | 3.79 | |
| | Does not require a bus stop | 3.58 | |
| | Easily available services | 3.96 | |
| Comfort Factor | Suitable for the elderly | 3.01 | 3.37 |
| | Can load a lot of stuff | 3.52 | |
| | Clean bus environment | 3.45 | |
| | The load does not exceed the available space | 3.51 | |
| Safety Factor | Drivers are known | 3.49 | 3.29 |
| | Efficient driver | 3.36 | |
| | The structure of the bus/van used is safe | 3.17 | |
| | Drivers adhere to the rules when operating | 3.17 | |

The absence of this PSV license will put the safety of passengers at risk, namely the risk in terms of the driving skills of the drivers who drive unpermitted buses, for example, the driving skills to avoid any accidents (defensive driving skills). In the event of an emergency on the road, they will not know the proper action to be taken to prevent an emergency or accident while carrying passengers and this will endanger the safety of the passengers.

In summary, the level of acceptance of use regarding the effectiveness of unpermitted bus services was also measured using the mean score range.

The results of the analysis presented in these means are the answers to the respondents' level of acceptance, covering the factors of effectiveness of unpermitted bus services. In this study, the mean score indicator constructed by Jamil [26] was used by the researcher. According to him, the tendency that starts from a value of 1.00 to 2.33 represents a low level, a value of 2.34 to 3.66 represents a medium level, and a high level is represented by a value of 3.67 to 5.00. Therefore, the results showed that the average mean score for accessibility factor, reliability factor, and fare factor are at a high level, while the safety factor and comfort factor are at a moderate level, as shown in Table 4. The findings of this study clearly showed that unpermitted bus services play an important role, especially in providing transportation mobility facilities to users. However, users' perceptions towards the safety factor and the comfort factor were at a moderate level, indicating that the respondents accepted the existing services despite the fact that some aspects of comfort and safety were less emphasized by the drivers of that mode. For example, the attitude of some drivers who like to drive aggressively and take passengers in excess of the load, which causes discomfort among users and puts their safety at risk.

Table 4. Mean Score indicator.

| Mean Score Index | Interpretation (level) | Factors Influencing the Effectiveness of Unpermitted Bus Services | | |
|------------------|------------------------|---|------------------------------|-----------------------|
| 1.33 to 2.33 | Low | | | |
| 2.34 to 3.66 | Moderate | Safety Factor (3.29) | Comfort Factor (3.37) | |
| 3.67 to 5.00 | High | Accessibility Factor (3.69) | Reliability Factor (3.75) | Fare Factor (3.82) |

Source: Modified by Jamil [26].

4.3. Effectiveness Indicator Index of Unpermitted Bus Services

The effectiveness indicator index of unpermitted bus services was measured by obtaining the mean score value for all 20 attributes (elements) of effectiveness and dividing it by the total value of effectiveness elements (20) which had been multiplied by the highest level of effectiveness of 5 (refer to Table 5). Hayes [30] used this method to measure the level of user satisfaction in a service. According to the results, the effectiveness indicator index of unpermitted bus services Table 5 is at 71.78 percent.

Table 5. The effectiveness indicator index of unpermitted buses.

| Effectiveness Indicator Index of unpermitted buses |
|--|
| $\left[\frac{\text{The total mean score of the effectiveness elements}}{\text{The total element constructs x the highest level of effectiveness}} \times 100 \right]$ $\left[\frac{71.78}{20 \times 5} \times 100 \right]$ $= \frac{71.78}{100} \times 100$ $= 71.78 \%$ |

Source: Modified and adapted from Hayes [30].

Therefore, this effectiveness indicator index of the service at the level of 71.78 percent Table 6 indicates a good and effective level of acceptance, especially in the context of providing transportation mobility facilities to users. These findings clearly show how unpermitted bus services are capable of providing effective and relevant transportation facilities to the local community today. The effectiveness of unpermitted bus services is due to the weakness of the existing public transportation services, i.e., public bus services that are still difficult to access on certain routes.

This is proven by a study conducted by Saravanan, et al. [9], who discovered an imbalance in public bus services on some routes in Kota Kinabalu, with these routes receiving less public bus services, particularly in new development areas such as new housing areas, shopping malls, and new industrial areas. This situation has an indirect impact on individuals and communities who rely entirely on public transportation to get around on a daily basis. Meanwhile, unpermitted bus services have become an alternative option for users when they are unable to access public bus services.

These findings are also in line with the studies by Harifah, et al. [31]; Saravanan [32], who found that there were some drivers who chose to operate on routes that would only benefit them. As a result, public bus services were not evenly available in all areas across the city. For example, in the Telipok area, public bus services, which are stage buses, are limited to transporting passengers from Telipok town to Kota Kinabalu City Center. However,

public buses that transport passengers from the town to nearby villages are completely unavailable, forcing the villagers to rely on unpermitted bus services provided and operated by the villagers themselves.

However, unpermitted bus services which are seen as an effective alternative mode of transportation for users, continue to receive less attention from stakeholders. This is because this informal mode of transportation is often regarded as unsafe, always causing traffic congestion simply because they operate without a permit and there is no full research and knowledge about this mode. In the meantime, the researcher hopes that the authorities will think of more productive initiatives and strategies to help improve unpermitted bus services, especially in terms of user comfort and safety. This effectiveness indicator index of unpermitted buses leads to the conclusion that this mode of service is very important and needed as an alternative mode and can supplement the existing public transportation system. These findings can directly be used as a useful input for the authorities to further strengthen public bus services without overlooking unpermitted bus services that also serve to provide users with transportation mobility facilities.

Table 6. The effectiveness indicator index of unpermitted bus services.

| User acceptance index (%) | Effectiveness | Unpermitted buses |
|---------------------------|----------------------|-------------------|
| < 10 percent | Not effective | - |
| 11 percent – 35 percent | Less effective | - |
| 36 percent – 55 percent | Moderately effective | - |
| 56 percent – 75 percent | Effective | 71.78 (%) |
| >76 percent | Highly effective | - |

Source: Modified and adapted from Hayes [30].

5. CONCLUSION

This article has worked on consumer perceptions of unpermitted bus services in Kota Kinabalu. The findings of the study have shown that the level of user acceptance of unpermitted bus services was at a good level even though the services provided by this mode are informal. This clearly proves that the role of the unpermitted bus mode in Kota Kinabalu is very important in the context of providing transportation mobility facilities for residents living in some locations that do not have access to formal public transportation. This mode of transportation has become one of the transportation alternatives for the local community to move from one location to another, which has been proven through the factors influencing the effectiveness of unpermitted bus services. Despite the shortcomings in terms of comfort and safety, this mode is still preferred by users and provides a solution to the ineffectiveness of Kota Kinabalu's existing public transportation services. Accordingly, all responsible parties should be aware of the existence of this informal mode of public transportation, understand the policy and regulatory issues surrounding their operation, and develop strategies to help improve the performance of their services. It is hoped that through this article, stakeholders will take steps to further improve existing public transportation services while not overlooking informal services that also play an important role in terms of the mobility of residents.

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