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**Abstract**

This study aims to analyse users' satisfaction levels with the facilities and services of a public transportation hub in Malaysia. At present, the public transportation hub is considered an essential urban component in easing transportation issues globally. However, there is an argument regarding the facilities and services provided at these hubs that needs further attention. Therefore, to achieve the study's objective, this research has adopted a quantitative methodological approach to identify respondents' satisfaction levels with hub facilities and services. Primary data for this study was gathered from 100 respondents that used the Gelugor Public Transportation Hub in Penang. Descriptive analysis and inferential analysis were used to identify the satisfaction level of the current facilities and services provided. Findings reveal that several facilities and services of the Gelugor Public Transportation Hub received poor ratings among the respondents. Based on these findings, it is clear that there is a need to improve the facilities and services of this public transportation hub to ensure that it may effectively serve as an efficient urban transport system.

**Keywords:** Public Transportation, Transport Facilities, Transportation Hub, Transport Satisfaction, Transport Services.

## Introduction

The world nowadays has looked at the public transportation hub as no longer simply a place where the traveller arrives and departs. The public transportation hub has been identified as having the potential to create a ripple effect that encourages investment in the local economy, particularly in terms of generating new revenue streams (Monzon et al., 2016; Arcadis, 2015). Apart from that, an emerging trend and challenge have made public transportation hubs a critical component for urban mobility and accessibility (Sun et al., 2016). Due to this, many countries around the world have implemented transportation hubs at the national and regional levels according to their significance and capabilities to minimise urban mobility issues and problems. Currently, there is a widespread dependency on public transportation hubs globally due to their important contribution to urban travel (Amalingayya, 2013). Previous studies on the provision of transportation hubs within the city

or town have shown that urbanisation issues such as traffic, urban heat island, pollution, and others can be reduced by promoting green transportation environment design throughout the hub initiative (Ali, 2014; Anable, 2005; Hwe, 2006; and Noor, 2014). Previous research globally has revealed the importance of a comprehensive public transportation hub in meeting the tremendous transport demand. The hub undeniably is a good urban transport component that has contributed to mitigating and lessening the environmental, economic, and social urbanisation issues and problems, particularly in the transportation sector.

Malaysia is one of the emerging countries that currently contributes to the high number of urban congestion and traffic issues, especially in urban areas. Currently, these problems have resulted from an effective public transportation system that is methodologically not integrated (Rahman and Abdullah, 2016). The implementation of the public transport hub in Malaysia is one of the initiatives that have been pursued by the government in its efforts to make the public transportation system in Malaysia more environmentally aware as well as systematically to overcome the urban transportation issues (Ustadi and Shopi, 2015). Hashim et al (2019) have indicated that the quality of Malaysia's public transportation system is beyond the standard in terms of facilities and services. There are many aspects that do not satisfy the users. Therefore, endeavours have been made towards improving the public transportation system in Malaysia through the National Transport Policy (2019-2030), where they have identified the public transportation hub as one of the most important initiatives by strengthening the infrastructure, services, network, safety, integration, and connectivity through its thrust two and three. Furthermore, the transportation sector, as stated by the SDGs, is one of the critical aspects that should be given critical attention by focusing on the environmental, economic, and social dimensions (United Nations, 2015). Above all, this has shown that there is a need to strengthen Malaysia‘s public transportation hub in order to overcome the urban transportation problem mentioned. The integration of infrastructure and services is among the main issues that need to be considered systematically.

Therefore, this paper has been driven by two essential objectives. 1) to identify the characteristics of public transportation hub facilities and services and 2) to analyse respondents' satisfaction levels with Malaysia's public transportation hub facilities and services. Thus, the following research questions are outlined to achieve the study's objectives. 1) What are the characteristics of the facilities and services elements of the public transportation hub? and 2) What is the satisfaction level of facilities and services provided for Malaysia's public transportation hub? Hopefully, this study will shed light on public transportation hub facilities and services improvement. As a result, the hub can serve as an integrated centre for reducing urban transportation degradation and improving the urban mobility system. Despite this, it can also serve the urban community with good networking and accessibility to enhance the quality of life and urban community well-being.

**Literature Review**

A public transportation hub is defined as any facility where passengers and freight are assembled or distributed in such a way that they cannot move individually but only in groups (Rodrigue and Slack, 2016). For example, passengers must first go to bus terminals and airports "assembled" in busloads or air loads to reach their "dispersed" final destination. The hub can also be an interchange point involving the same or different modes of transport, such

as bus to bus or train to bus. Hub transport may be where the urban corridor network connects and intersects in the sense of urbanisation around a city or town (Collins, 2005). From a practical point of view, there is an interchange with other public transport modes such as on the ground (bus, train), on the air (plane), and on the water (ferry, boat), where different modes of transport are used to exchange traffic. Moreover, the introduction of a transport hub in the centre of the city is the most significant because it plays a role in traffic circulation across the city by limiting the capacity of private vehicles on the road and by implementing public transport services at the hub.

Good public transportation service is an important way to provide maximum satisfaction for users who use the hub. It's a must-have service to grow and enhance the transport competitiveness of the hub. According to Rovert and Vladimir (2017), public transportation services may be defined as a fixed quality criterion, intended either by the transporter or by the customer to meet the customer's or traveller's needs. It would also improve the travel experience of passengers by introducing a higher standard of service (Hensher et al., 2010). The service attributes can be divided into four main categories: convenience, cost, safety, and environmental impact (Guner and Cebeci, 2017). The availability of transport services such as route transferability, timeliness, frequency, network ticketing, and network coverage is related to convenience. Moreover, in terms of cost, it refers to passengers' affordability to purchase the services (ticket). Besides, in terms of safety, it refers to security measures such as CCTV, lighting elements, and security guards that can prevent crime from occurring at the transport hub. Finally, in terms of environmental quality, it refers to the quality of the region's environment, such as noise, air pollution, and others that can be avoided through the implementation of the hub (Eboli and Mazzula, 2011).

In addition, the characteristics of the transport hub are the physical elements that influence the level of satisfaction of the users, which can also affect the frequency of people visiting and using the hub (Di Ciommo, 2002). This physical element is divided into several zones to serve users the best quality of services and facilities through the hub (see figure 1). According to Hernandez (2015), there are three areas: the access/egress zone, facilities and retail zone, and transport/transfer zone, which are all integrated into each other. As regards pedestrians, several service facilities should be provided, such as signposting, safe direct routes, unimpeded movement between facilities and modes of transportation, local area information, taxi or dial-up information, lighting, clear sightlines, CCTV and traffic control measures such as zebra crossings if necessary. Moreover, the various elements for cyclists, such as secure cycle parking, signposting, safe direct cycle routes and local area information are also important. In addition, as regards motorised transport, the hub should provide more priority for public transport, buses segregated from general traffic, shelters or waiting areas, secure parking, convenient access, legibility, wayfinding, signage, and shipping or collection space. From a facilities and retail zone perspective, the hub should provide adequate traveller facilities such as easy movement between facilities (escalator or lift), ticketing facilities, real-time travel information, CCTV and clear sightlines, retail or food outlets, continuous shelter, seating areas, toilets, clear signage and inclusive information for all users.

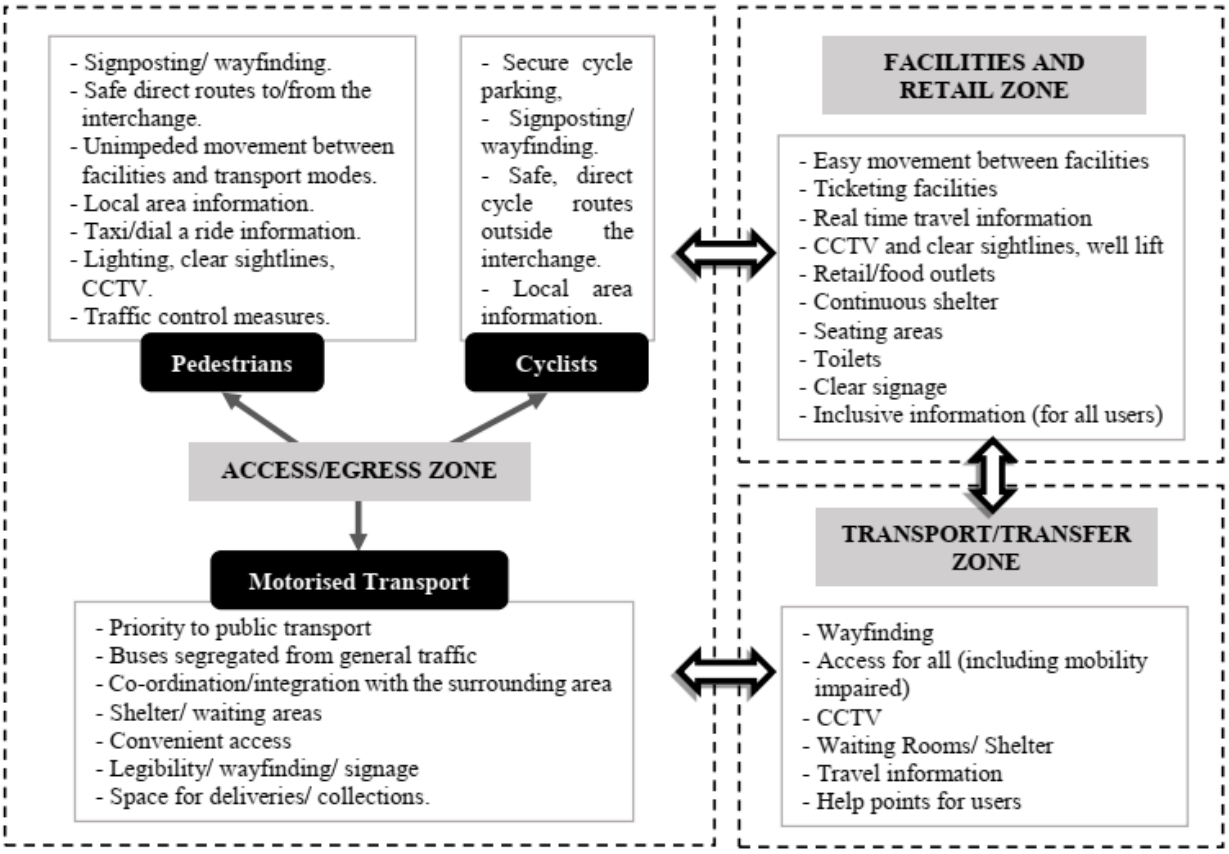


Figure 1: Hub Characteristics Physical Element
(Source: Monzon et al., 2016)

To attract more users to use the hub as well as achieve optimum movement performance within the hub, the infrastructure aspect also needs to be systemically provided. The location and attractive public spaces such as parks and squares will also have a positive effect on the hub and increase the passenger experience (Huang and Hu, 2012). The purpose of the hub's facility is to facilitate passenger movement between floors within the interchange centre, usually via escalators and elevators. In general, escalators are accessible in large or small hubs with multi-story structures, typically in the passageway (Wang and Ren, 2014). These facilities (elevators and escalators) can play a role in providing convenient access for passengers from floor to floor, especially for pregnant women, the disabled, and the elderly. To accommodate travellers, this facility is significant due to the increasing number of hub users. Besides, the washrooms have become one of the main facilities for the hub, especially for those using buses and subways in an interchange hub. Toilets have to be located in the outbound and inbound spaces, so it's convenient for passengers to get in. On the other hand, Wu (2011) indicated that to make it easier for passengers to read and understand what information is presented by signage in the hub, an information system is important for precise, simple, fast, and transparent passenger guidance services.

## Method

This study has employed a quantitative methodology in nature. This deductive approach has been adopted in measuring the users' satisfaction with the facilities and services at the public transportation hub in Malaysia. To achieve the study objectives, the data has been collected

by using a questionnaire survey. The questionnaire survey for this study was divided into three sections. Section A consists of the respondents' profile, Section B consists of facilities and services indicators, and finally, Section C is the suggestions for future improvement for the hub. A simple random sampling technique was used for data collection through the questionnaire. The study population involved 100 respondents among the multi-racial category (Malay, Chinese, India, and others) in Gelugor Public Transportation Hub, Penang. These respondents were hub users with an average age of 13–60 years old. For the purpose of analysis, the IBM SPSS Statistics 26 has been used to aid the analysis process. To identify the mean for services and facilities of the hub, descriptive and inferential statistics (Mann-Whitney U test) were used to gather the outcomes needed. The mean score of the facilities and services indicators for the hub was finally used to interpret the hub's satisfaction level.

**Results and Discussion**

Table 1 shows the respondents' profiles for this study. There were 51% male respondents and 49% female respondents. The respondents involved in this study were predominantly 21–40 years old, consisting of 70%, 41–60 years old with 22%, above 60 years old with 6%, and the range of 13–20 years old with 2%. This shows that the youth are the most preferred group to use the hub. The ethnicity distribution revealed 40% Malay, 34% Chinese, 19% Indian, and others with 7%. The highest respondents' income levels recorded were RM2000 with 36% and 2001-RM4000 with 36%. RM4001-RM6000 is ranked second with 14%, RM6001-RM10000 is ranked third with 8%, and RM10001 is ranked last with 6%. The analysis of income level showed that most of the respondents who use the hub are from the categorical B40 classification. The highest distance range of respondents recorded is 2km – 3 km with 37%, then 4km – 5 km with 26%, followed by below 500 metres with 25%, and lastly above 5 km with 12%. The distance range showed there are very few users for long distances to use the hub due to accessibility and mobility constraints. Most of the respondents have been identified as preferring to drive to the hub with the highest score of 55%, second cycling with 16%, followed by public transport and motorcycles with 11%, and lastly walking with 7%. The hub may need to encourage users to come by public transport or non-motorised transport by providing a good commuting infrastructure and services.

For respondents' travel costs, the highest are RM 6.00–RM10.00 with 41%, followed by RM 1.00–RM 5.00 with 18%, RM 11.00–RM 20.00 with 14%, RM 21.00–RM30.00 with 12%, and lastly above 41.00 with 3%. The traveler's cost showed that the transportation costs spent by the respondents to reach the hub are quite expensive as the distance increases. For the aspects of frequency of visiting the hub, the highest is twice a month with 58%, followed by twice a week with 17%, every day with 15%, and 3 times a week with 10%. The small number of everyday users within just 15% showed that public transportation hubs are still not being utilised as the preferred mobility mode by the urban community. The main reasons are that the hub is not fully supported by an integrated system for transit interchange purposes. Furthermore, the expensive cost needs to be spent as the distance increases as well as first mile and last mile problems are the factors that need crucial attention.

Table 1
*Respondents Profile (N=100)*

| Background | Percentage |
|---|---|
| **Gender** | |
| *Male* | 51 |
| *Female* | 49 |
| **Age** | |
| *13-20 years* | 2 |
| *21-40 years* | 70 |
| *41- 60 years* | 22 |
| *> 60 years* | 6 |
| **Ethnicity** | |
| *Malay* | 40 |
| *Chinese* | 34 |
| *Indian* | 19 |
| *Others* | 7 |
| **Income** | |
| *< RM 2000* | 36 |
| *RM 2001 – RM 4000* | 36 |
| *RM 4001 – RM6000* | 14 |
| *RM 6001 – RM 10,000* | 8 |
| *> RM10,001* | 6 |
| **Distance from Home** | |
| *< 500 meters* | 25 |
| *2 km – 3 km* | 37 |
| *4 km – 5 km* | 26 |
| *> 5 km* | 12 |
| **Accessibility to the Hub** | |
| *Driving* | 55 |
| *Walking* | 7 |
| *Cycling* | 16 |
| *Motorcycle* | 11 |
| *Public transport* | 11 |
| **Travel Cost** | |
| *RM 1.00 – RM 5.00* | 18 |
| *RM 6.00 – RM 10.00* | 41 |
| *RM 11.00 – RM 20.00* | 14 |
| *RM 21.00 – RM30.00* | 12 |
| *RM 31.00 – RM 40.00* | 12 |
| *> RM 41.00* | 3 |
| **Frequencies Visiting Hub** | |
| *Twice a month* | 58 |
| *Twice a week* | 17 |
| *Three times a week* | 10 |
| *Everyday* | 15 |

Respondents' satisfaction towards hub facilities and services has been measured by using a 5 point Likert scale; (5) Very Satisfied, (4) Satisfied, (3) Moderate, (2) Unsatisfied, and

(1) Very unsatisfied. The determination of the mean 1.00 – 2.33 is low, 2.34 – 3.66 is medium, and 3.67 – 5.00 is high has been used for mean calculation purposes. Table 2 displays the overall mean findings for the hub facilities aspect. The lowest mean that has been recorded is the aspect of information signage, with 1.00. The second is the waiting area for respondents with 1.94, and the third lowest is the aspect of safety for the hub, with a 2.06 mean value, and lastly, the parking area, with a 2.27 mean value. However, the medium range of mean consists of the aspect of the prayer room with 2.73, walkways with 2.74, shops with 2.73, and lift service with 2.96. However, there is only one indicator having a high mean score for the hub facilities, which is the washroom, with a 3.86 mean value.

Table 2
*Mean Distribution Towards Respondents' Satisfaction with Hub facilities*

| Facilities | Mean | Determination |
|---|---|---|
| Parking Satisfaction | 2.27 | Lower |
| Wash Room | 3.86 | High |
| Waiting Area | 1.94 | Lower |
| Information Signage | 1.00 | Lower |
| Prayer Room | 2.73 | Medium |
| Walkways | 2.74 | Medium |
| Safety | 2.06 | Lower |
| Shops | 2.73 | Medium |
| Lift Service | 2.96 | Medium |

Note: Mean < 2.33 = Lower; Mean 2.33 – Mean 3.67 = Medium; Mean > 3.67 = High

Table 3 shows the mean distribution of respondent satisfaction regarding the hub services. The overall mean of services indicated that they were at the medium level. The ticket counters have recorded the lowest mean value of 2.48, followed by the second lowest is the aspect of bus punctuality of 3.0, and the third-lowest is the aspect of bus frequency of 3.42 mean value. The highest mean value for the hub services is the aspect of bus network coverage, with a 3.42 mean value.

Table 3
*Mean Distribution Towards Respondents' Satisfaction with Hub Services*

| Services | Mean | Determination |
|---|---|---|
| Ticket Counters | 2.48 | Medium |
| Bus Punctuality | 3.06 | Medium |
| Bus Frequency | 3.38 | Medium |
| Bus Network Coverage | 3.42 | Medium |

Figure 2 shows the respondents' preferences regarding the hub facilities' improvement aspects. The highest percentage that has been recorded is the aspect of providing escalators to the hub, with 38%. Second is the aspect of providing a conducive waiting area for the people who use the hub services with 22%. The third is the provision of a good parking area that is accessible to all users, which is considered pivotal with 17%. The other aspects also being considered by respondents are security with 15%, food court with 4%, information signage with 3%, and privacy room with 1% recorded.

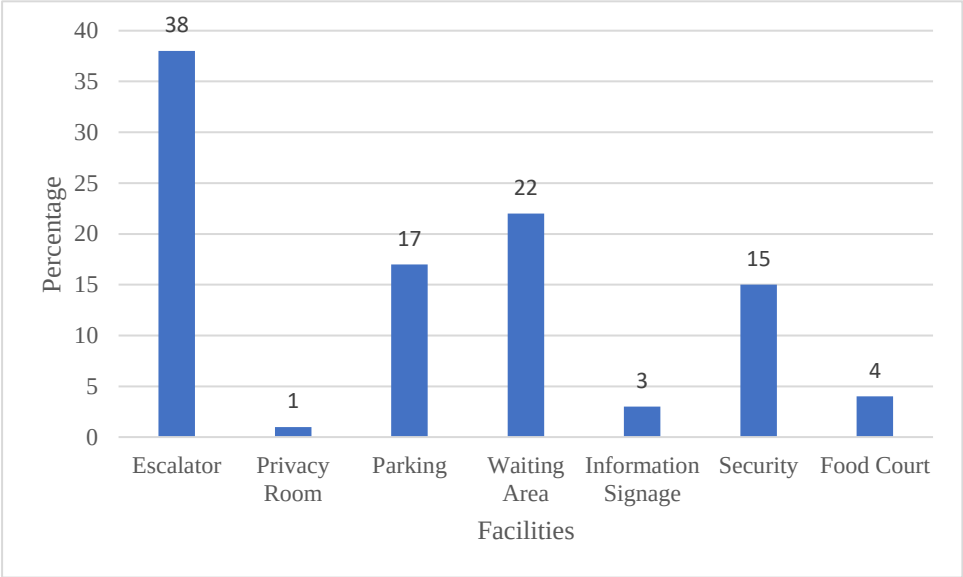


Figure 2: Respondents' Preference for Hub Facilities Improvement

Figure 3 shows the respondents' preferences regarding the hub service improvement aspects. The highest percentage aspect is the ticketing system, with 34% recorded. Second is long bus journeys with 19% and third is transit buses with 17%. Other aspects suggested by respondents are light rail transit (LRT) with 12%, e-hailing with 12%, and taxis with 6%.

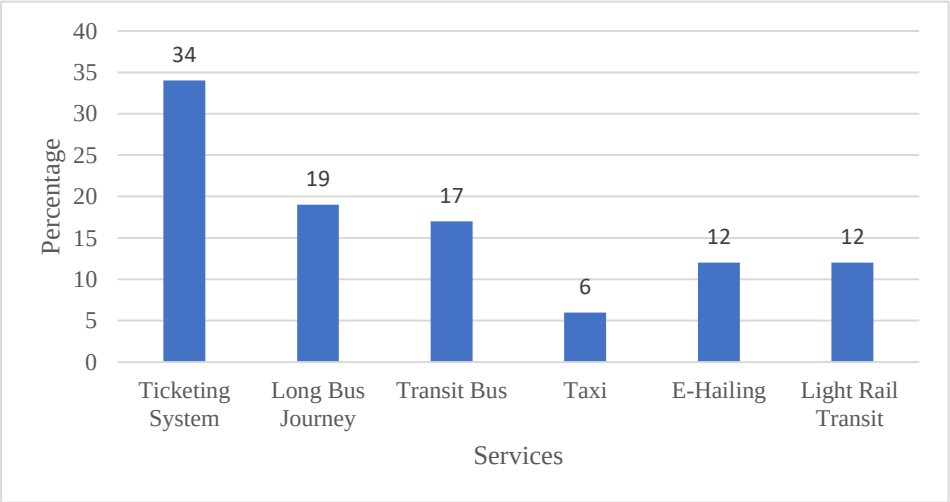


Figure 3: Respondents' Preference for Hub Services Improvement

**Hypothesis Testing**

Hypothesis 1

H0: There is no significant relationship between gender and the facilities at the public transportation hub.

H1: There is a significant relationship between gender and the facilities at the public transportation hub.

The Mann-Whitney U test was used to identify the significant relationship between gender and the facilities aspect of the public transportation hub. Table 4 shows the mean of facilities recorded by [M = 2.48] with [S.D = 0.284] of standard deviation. For the gender of the

respondents, [M] = 1.49 as the mean value has been recorded with [S.D] = 0.502 as the standard deviation. The finding showed there was no significant relationship between gender and the facilities aspect of the hub where the assumption of a significant 2 tail value is 0.021, which is below 0.05. Therefore, the null hypothesis H0 was accepted for this aspect, and the alternative hypothesis H1 was rejected.

Table 4
Mann-Whitney U test

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Mean of Facilities | 100 | 2.4833 | .28487 | 1.78 | 2.78 |
| Gender of Respondents | 100 | 1.4900 | .50242 | 1.00 | 2.00 |

| | Gender of Respondents | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Mean of Facilities | Male | 51 | 44.32 | 2260.50 |
| | Female | 49 | 56.93 | 2789.50 |
| | Total | 100 | | |

| | |
|---|---|
| Mann-Whitney U | 934.500 |
| Wilcoxon W | 2260.500 |
| Z | -2.310 |
| Asymp. Sig. (2-tailed) | .021 |

a. Grouping Variable: Gender of Respondents

Hypothesis 2
H0: There is no significant relationship between gender and the services at the public transportation hub.
H1: There is a significant relationship between gender and the services at the public transportation hub.

Table 5 showed that the mean of services was recorded by [M = 3.08] with [S.D = 0.314] of standard deviation, and for the gender of the respondents, [M = 1.49] of standard deviation. The finding showed that there is a significant relationship between gender and the services aspect of the hub where the assumed significant 2 tail value is 0.419, which is higher than 0.05. Therefore, the null hypothesis H0 was rejected for this aspect, and the alternative hypothesis H1 was accepted.

Table 5
*Mann-Whitney U test*

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Mean of Services | 100 | 3.0820 | .31411 | 2.80 | 3.80 |
| Gender of Respondents | 100 | 1.4900 | .50242 | 1.00 | 2.00 |

| | Gender of Respondents | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Mean of Services | Male | 51 | 52.71 | 2688.00 |
| | Female | 49 | 48.20 | 2362.00 |
| | Total | 100 | | |

| | |
|---|---|
| Mann-Whitney U | 1137.000 |
| Wilcoxon W | 2362.000 |
| Z | -.808 |
| Asymp. Sig. (2-tailed) | .419 |

a. Grouping Variable: Gender of Respondents

**Conclusion**

Creating a tremendous public transportation hub has been considered a vital strategy for the sustainable mobility and accessibility of the urban community. Hence, this study has revealed the respondents' satisfaction level regarding the facilities and services of public transportation hub for future improvement. Among the important key findings is that there is a lower and medium mean of facilities and services for this hub. This research also explains why Malaysians are still reluctant to use public transportation. They switch to private vehicles due to the stressful experience of facilities and services served by the public transportation system in Malaysia. Therefore, there's a need to improve facilities and services to encourage public transportation usage. However, this study involved a limited number of respondents and the indicators being measured. Therefore, it is suggested that further research needs to be conducted with more participants and include other related facilities and services indicators comprehensively.

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