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ON THE ROAD TO SUSTAINABILITY: INSIGHTS FROM JOHOR'S FREE BUS SERVICES

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Abstract: In 2016, the Muafakat Johor Bus was introduced to reduce travel costs for Johor citizens, marking a significant step towards sustainable development. This free bus service aims to enhance mobility and minimise the environmental impact. Understanding passenger characteristics and motivations are essential to keep the service running. This study employs a social survey targeting daily users of the free bus service to identify significant passenger traits. The survey revealed that over 50% of the passengers are female. They are all predominantly young, single, high school graduates, without income, and neither own a vehicle nor possess a driving license. These findings suggest that the service primarily benefits individuals with limited options for transport. A correlation analysis indicated a weak relationship between passenger characteristics and motivations, showing that most passengers use the service regardless of social status. However, few passengers cited environmental concerns as their motivation. This research article highlights the importance of the Muafakat Johor Bus service in providing accessible transportation and supporting sustainable development. By identifying user characteristics and motivations, the study contributes to a better understanding of how such initiatives can effectively address urban mobility challenges and promote sustainable living within the community.

Keywords: Sustainable development, free bus, passenger characteristics.

Introduction

In recent years, numerous studies on sustainability and sustainable development have been conducted worldwide. Understanding both terms is challenging due to inconsistencies in their definitions which pose a core challenge for researchers (Moore *et al*., 2017). Sustainable development, in particular, lacks a standardised definition or set of limitations across different fields. Ozili (2022) highlighted four major factors that attract the attention of policymakers and researchers in sustainable development. First, many nations have mutually agreed on the United Nations' goal to improve the world for the better. Second, sustainable development should promote the use of sustainable practices for the benefit of both current and future generations. Third, it should serve as a comprehensive framework for achieving all sustainable development goals. Finally, it must foster socio-economic welfare for all living things (Ozili, 2022). The United Nations predicts that by 2030, 60% of the global population will reside in urban areas with this percentage rising to 70% by 2050. As urbanisation continues worldwide, large cities are facing challenges in implementing sustainable, safe, and resilient economic and social policies to ensure urban prosperity (United Nations, 2023). One of the more significant challenges concerns the physical expansion of cities which is occurring at a faster rate than population growth. This rapid expansion leads to higher infrastructure costs, increased energy consumption, and greater carbon dioxide emissions (Solaymani, 2022).

There are no exceptions when it comes to integrating sustainable development into every aspect of daily life, especially with regard to the transition to renewable energy and a circular economy which are crucial initiatives for tackling climate change and reducing fossil fuel emissions (Asman *et al*., 2023). Additionally, road users should consider using active transportation to reduce dependence on motorised vehicles, as it is one of the most effective ways to protect the environment from pollution and promote a healthy lifestyle (Zakaria *et al*., 2023). Transportation is recognised as a major contributor to hazardous gases, leading to air pollution and climate change. However, implementing sustainable transportation practices can help mitigate the environmental impacts that are of growing concern worldwide (Ahmed & Monem, 2020; Heidari *et al*., 2023).

In addition to hazardous gases released by manufacturers, motorised personal vehicles significantly contribute to greenhouse gas (GHG) emissions. The largest contributors to global GHG emissions are electricity and heat production, as shown in Figure 1, followed by the transport sector, manufacturing, construction (particularly involving cement and similar materials), and agriculture. Although the transport sector saw a decrease in GHG emissions in 2020 due to movement control order restrictions imposed during the COVID-19 pandemic, emissions are expected to rise again as restrictions have been lifted and people resume travel (Darma *et al*., 2023; Guevara *et al*., 2023; Mallia *et al*., 2023).

A study conducted in Kuwait by Al Kheder (2021) suggested that public transport can act as an alternative to reduce the release of GHG from personal vehicles. In that study, vehicle emissions data gathered before and after congestion declined due to the increased use of public transport on the streets. Table 1 shows the results of the survey. It is evident from the table that when public transport is widely utilised, it can effectively reduce vehicle emissions, especially GHG on the streets, highlighting the importance of public transport to both humans and the environment. In addition to that, Malaysia's energy consumption is expected to increase over time with the transportation sector being the primary contributor to this rise

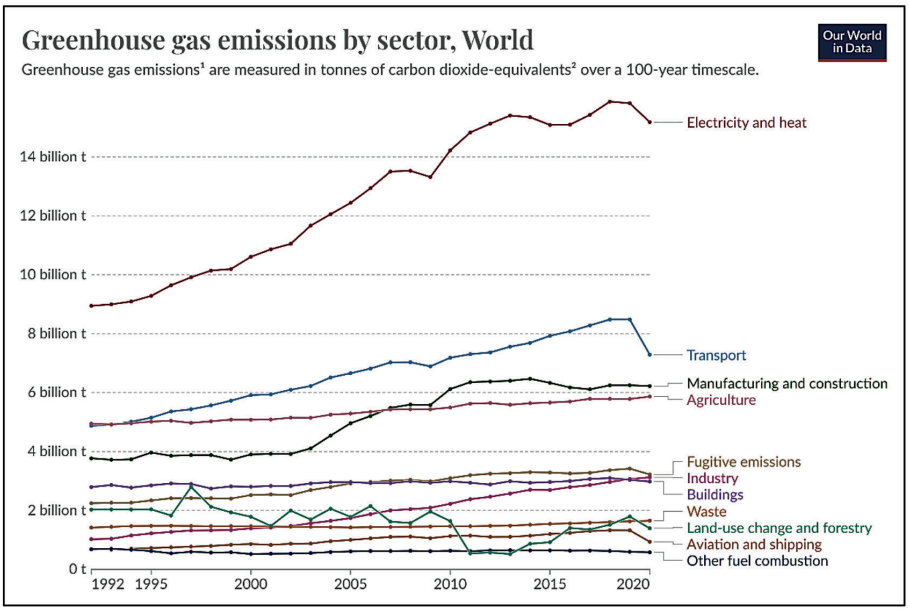

Figure 1: Global GHG emissions (Ritchie *et al*., 2020)

Table 1: Emissions from vehicles before and after the congestion has decreased (Al Kheder, 2021)

Street	Vehicle Emissions (g)					
	Before			After		
	CO	NOX	VOC	CO	NOX	VOC
Ahmad Al Jaber	21.8	4.2432	5.0544	11.72	2.28	2.716
Al Soor	9.175	1.785	2.126	8.812	1.718	2.042
Fahad Al Salem	5.34735	1.0404	1.2393	5.249	1.02	1.21662
Mubarak Al Kabeer	22.25	4.329	5.1577	12.14	2.36	2.814

Interpretation:
CO = Carbon monoxide
NOX = Nitrogen oxide
VOC = Volatile organic compound

(Ahmad Termida *et al*., 2022). Malaysia is also challenged with enhancing the quality of its public transportation system as part of urban development. Public transport is seen as the most sustainable method to reduce the reliance on private vehicles which are a main contributor to carbon dioxide emissions that have a negative impact on the environment (Mohd Yahya *et al*., 2024).

In 2015, only 17.1% of passengers on public transport in Malaysia used a shared mode of transport making it one of the lowest rankings among major cities. Following improvements in capacity and the expansion of the rail network, this figure rose to 25% by 2020. Still, this remains significantly below the National Key Result Areas' goal of a 40% shared mode by 2030 (Abd Ghani *et al*., 2022). The relatively low increment is because in 2018, Malaysia had the highest rate of motorisation among Association of Southeast Asian Nations (ASEAN) countries with 439 vehicles per 1,000 people—four times the mainland average. The foremost and most urgent challenge in reducing emissions lies in tackling energy consumption in the transport sector (Kosai *et al*., 2022).

However, public transportation is actually in high demand by city dwellers for several reasons, including its lower costs, convenience, reasonable services, and ability to reduce traffic congestion (Litman, 2021). Moreover, sustainable practices allow road users to experience their journey with ridesharing alternatives. The idea of ridesharing is mainly due to the authority's use of public transport services as part of the country's welfare. It also serves as a means of reducing traffic congestion while offering easy and convenient transport services. Consequently, urban areas typically have a hub for public transport terminals at places near airports, buses, tramways, trains, subways, and ferries (Rodrigue, 2020). For instance, in London, since buses are flexible, readily available, and easily accessible, it is by far the most popular mode of public transportation. Meanwhile, in Malaysia, public buses are generally preferred over other forms of public transit such as trains or aeroplanes due to their lower cost and greater coverage (Ab Majid *et al*., 2022). Malaysia encourages people to use public transport such as buses in large cities like Kuala Lumpur to reduce traffic congestion and travel times. The other forms of over land public transport available in Malaysia is the rail transits that include the Express Rail Link (ERL), commuter, and monorail, as well as taxis (Syukri Yahya *et al*., 2020).

Some states in Malaysia provide free bus services funded primarily by the state government to assist with the mobility of local residents who cannot afford to own or travel by private vehicle. A pass card is needed for local passengers to prevent foreign workers and tourists from using the service. Previously, a free bus service in Malaysia called Go KL was available in Kuala Lumpur. However, the public complained as Go KL was viewed as a waste of time, money, and resources by the Selangor state

government as residents of the city including the rich, the poor, foreign workers, and tourists were all able to use this limited shared facility (Malaysiakini, 2018). Meanwhile, in Johor, Muafakat Johor Bus service caters exclusively for Malaysians. The service was introduced in the first week of April 2016 as one of the initiatives to help residents in Johor by providing them a handy and practical public transport system that covers all regions in the state. To use the service, passengers will scan their identification cards to verify their Malaysian citizenship. The service started with only 15 routes in Johor Bahru including the Universiti Teknologi Malaysia campus. In just one year, the service expanded to cover 16 areas, including smaller districts like Labis and Segamat (Johor Public Transport Corporation, 2022).

Studying the characteristics of loyal passengers within the context of implementing free bus services as a sustainable development initiative in Malaysia's transportation system provides valuable insights. Therefore, this study was carried out in Johor to gather essential data from loyal passengers on the demographics, motivations for using the free bus services, the reasons for travel, and other relevant factors. It allows for tailored improvements to service quality and efficiency as well as the optimisation of routes and schedules to better meet passenger needs. This data also supports efficient resource allocation, directing funds to where they can have the greatest impact. To promote sustainable transportation to road users, firstly, there is a need to discover the targeted users while this refers to the existing passengers' social background.

Factors Contributing to Free Bus Ridership

Beyond offering free rides, the attractiveness of bus services to passengers is influenced by internal and external factors. Internal factors are dependent on the effectiveness of bus companies to tailor their services based on the population in the area (Sundara Sakaran *et al*., 2020). This is also important to satisfy customer needs. However, since this article highlights the characteristics of free bus passengers, the role of external factors is more prominent. The external factors are beyond the control of the bus companies and can have a major effect on demand and supply for travel (Drabicki *et al*., 2021). For example, an increase in income levels among locals may shift their travel mode from passengers on public transport to private vehicle owners. The external factor in user satisfaction is also impacted by non-mode individual factors related to attitudes, habits, and choices. In addition to the fundamental socio-demographic characteristics that must be taken into account, many other aspects should be explored (Faroqi *et al*., 2020).

Studies on public transport by Stryhul *et al*. (2021) emphasised that interpersonal choices and restrictions are entrenched in social and physical surroundings with their own set of opportunities and constraints, which can determine user travel decisions and perspectives. Therefore, both internal and external factors that determine passenger characteristics may have an impact on a person's travel behaviour. External characteristics are traditionally highlighted in transportation studies, focusing on the transport geography (activity-based, built environment). However, internal characteristics draw on interpersonal psychological theories such as social background, personal characteristics, mindsets, desires, and routines, as shown in Figure 2 (St-Louis *et al*., 2014).

The choice of public bus ridership is influenced by passenger characteristics. The goal of upgrading public transport such as buses is to provide a secure, safe, comfortable, affordable, quick, and reliable transportation mode for every road user. Additionally, the presence of public transport can create job opportunities for locals, as the system needs people to operate smoothly (Lalthlamuana, 2022). Zakaria and Mohd Noor (2020) conducted a study on foreign workers in Sabah, Malaysia, which found that passenger characteristics play a crucial role in determining the mobility and mode of choice of public transport. These passenger characteristics are depicted in Figure 3.

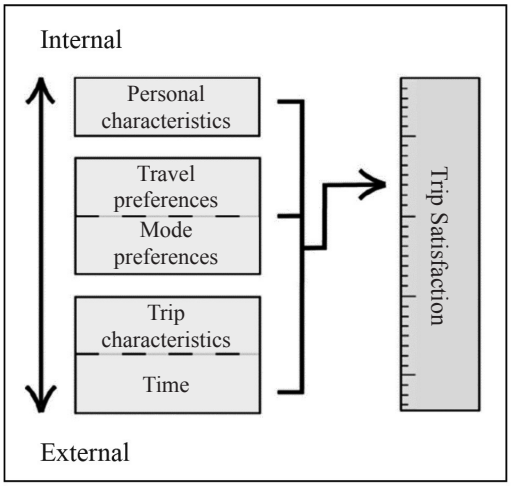

Figure 2: Internal and external characteristics of passengers (St-Louis *et al*., 2014)

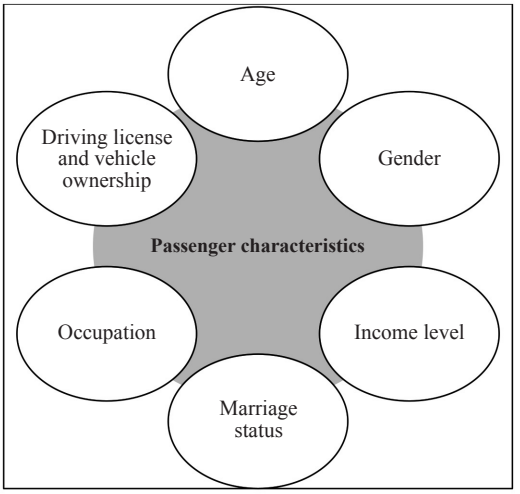

Figure 3: Public transport passenger characteristics
Source: Modified from Zakaria and Mohd Noor (2020)

Every passenger must have their reason for using public transport, which may vary depending on the purposes for travel. As an example, Wang and Liu (2015) observed that various passengers at a university (working people and students) have different reasons for travel. Students claimed to use public transport owing to the limited parking spaces available on campus. Meanwhile, the staff preferred travelling with zero stress (for example, the need to focus on driving private vehicles in traffic). Moreover, public bus services are an essential part of the social infrastructure that connects people with various sectors like healthcare, education, retail, housing, communal services, and leisure activities (Bull *et al*., 2021; Ryabchikov *et al*., 2022). A research made by Rasca and Saeed (2022) in Agner, Norway has found that several factors significantly influence the choice of public transport for daily commuting. Car ownership, distance to work, parking availability, and travel fees are the key determinants. Moreover, the likelihood of road users opting for public transport increases if they

do not have individuals in their care (Yang *et al*., 2023). Conversely, a low bus frequency and long walking distances to bus stops negatively impact the use of public transport. This study is crucial for understanding the characteristics of bus passengers, particularly in the context of free services. This study also highlights group of people and their motivations for public transport use.

Methodology

Figure 4 is a flowchart detailing the methodology of this study. Initial studies began with identifying the problem statement, supported by a literature review to determine the research title and objective. The literature review revealed that different groups of passengers have various reasons for using the free bus services. The loyalty of passengers to free bus services is influenced by multiple factors. In

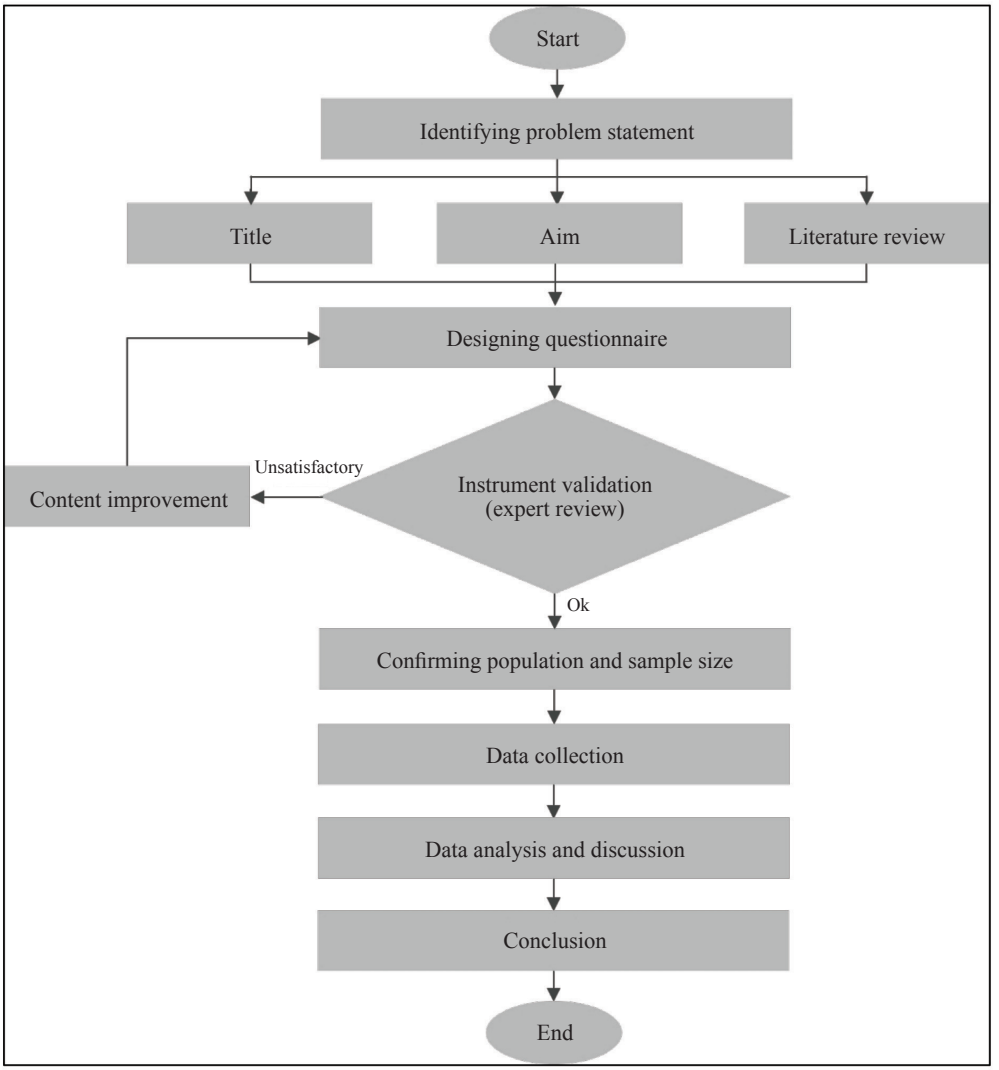

Figure 4: Research flowchart

Malaysia, free buses are well-known for helping citizens reduce travel expenses while going to work or school; thereby, promoting sustainable transportation modes. Further details on the subsequent research design will be discussed in a later section of this article.

Research Instrument

The data in this study was gathered from a series of surveys conducted across Johor, Malaysia. The main research instrument was a questionnaire consisting of two sections; Section A collected the respondents' demographic information and Section B focused on the motivations for using the free bus service. The questionnaire was fully administered in *Bahasa Melayu* (Malay language) for ease of communication, given that only Malaysians were qualified to participate.

After that, the population and sample size were determined. The target respondent pool were the daily users of the Muafakat Johor Bus service, which is used by approximately 3,105 users a day as stated by an executive in charge at Johor Public Transport Corporation (Johor Public Transport Corporation, 2022). By referring to Krejcie and Morgan (1970), a sample size of 342 respondents was identified for this study. 400 sets of questionnaires were then distributed to the targeted respondents. Of these, 375 questionnaires were returned, which met the minimum response rate required for this study.

Instrument Validation

Reliability analysis via pilot testing was not conducted as the survey items only required simple "Yes" or "No" and "True" or "False" responses, which did not allow for the establishment of trends or patterns. This is due to the measurement scale of all the sections in the questionnaire being nominal and ordinal. This limitation stems from the absence of Likert-scale questions that typically assess satisfaction levels, frequency, and degrees of agreement (Bujang *et al*., 2024). Many previous researches also did not include a reliability analysis on the respondents' demographic data (Khaleel & Nassar, 2018; Pakurár *et al*., 2019; Ibrahim *et al*., 2021; Ahmad Termida *et al*., 2022).

Hence, this study only focused on the validation process through expert review. As shown in Table 2, five experts were chosen in accordance to the claims made by Polit *et al*. (2007), which stated that three experts are adequate for instrument validation process. Experts from different educational backgrounds in transportation and language studies were asked to evaluate every item in the questionnaire (draft). The instrument was then refined and modified according to the comments and

Table 2: Background of the experts for validation process

No.	Qualification	Occupation	Expertise
1	PhD	University lecturer (Assoc. Prof.)	Transport, ground transport, public bus, traffic engineering, transportation planning, driving behaviour
2	PhD	University lecturer	Transportation engineering, travel behaviour, road safety, public transportation
3	Master	Executive planning and compliance at public transportation organisation	Transportation engineering, transportation planning
4	Master	High school teacher (Language)	*Bahasa Melayu*, mass communication, social science, education
5	Degree	High school teacher (Language)	*Bahasa Melayu*

suggestions given by the experts so that the questionnaire could be used for data collection. Once validation process was completed, the data collection process was started immediately.

Data Collection Process

Physical copies and online forms of the questionnaire, accessible via QR code were distributed over four months, from June 2022 to September 2022. Strict controls were implemented to ensure that both forms were distributed only with the researcher's permission, which prevented data collection from outside the target group. Respondents were assured that all survey information would remain confidential and used solely for research purposes. Data collection was personally done by the researchers with willing respondents who met the criteria outlined in Figure 5. The criteria was strictly adhered to get a higher response rate and accurate respondent information. Respondents were then briefed about the purposes of the survey and encouraged to ask questions for better understanding.

Since there was a criteria requirement to participate as respondents, the sampling method applied in this study was the judgemental non-random sampling method. With this approach, the researcher chose only individuals in the target group who were qualified to participate in the research study (Taherdoost, 2016). Although the method used to obtain the sample was not a scientific approach in determining a target group, it is believed that the application of this method was the least costly, most convenient, and timely for this research.

Data Analysis Procedure

Converting the survey responses into a format that can be edited to generate a statistical analysis was involved in this study, which included data entry, editing, coding, and monitoring the entire data processing process. Recent advancements in technologies have significantly improved data processing techniques (Huang, 2020). Therefore, Microsoft Excel was used for initial data processing while further analysis such as frequency and correlation was then fulfilled via SPSS version 26.

Before running the correlation analysis, the Kolmogorov-Smirnov test was applied first to validate the normality of the continuous data obtained, considering a sample size of more than 50 (Mishra *et al*., 2019). As shown in Table 3, the Kolmogorov-Smirnov test yielded a value of 0.000, indicating that all data was not normally distributed at a significance level of less than 0.05; thus, demanding the application

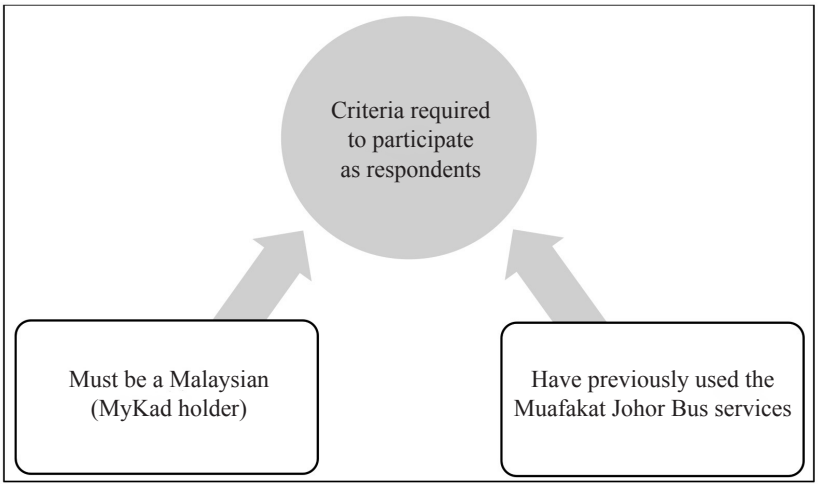

Figure 5: Criteria needed to be part of respondents for this study

Table 3: Summary value for Kolmogorov-Smirnov coefficient in normality test

Sections	Kolmogorov-Smirnov
	Sig.
Section A (Demographic information)	0.000
Section B (Motivations for using free bus services)	0.000

Table 4: Ideal range of determining the correlation coefficient (Senthilnathan, 2019)

Coefficient Size	Correlation Strength
Zero	No correlation
Less than (±) 0.20	Very low
(±) 0.21 to 0.34	Low
(±) 0.35 to 0.49	Moderate
(±) 0.50 to 0.69	High
(±) 0.70 to 1.00	Very high

of non-parametric analysis. Spearman's Rho was applied for the correlation analysis in this study, while the relationship strength was then classified according to the test used by Senthilnathan (2019), as depicted in Table 4. The correlation analysis was done to determine the influence of the respondents' social status (demographic profile) and their motivations for using the free bus services.

Results

Respondents Demographic Background

Table 5 shows the frequency analysis results on the demographic background of Muafakat Johor Bus passengers. According to the initial findings, 36.3% of the respondents were male while 63.7% were female. In terms of age distribution, more than half or 55.5% of the respondents were aged below 20 years old while 19.7% were aged between 21 and 30 years old, 9.9% were more than 61 years old, 7.2% were aged between 41 and 50 years old, 4.3% were aged between 51 and 60 years old, and the smallest group at 3.5% was those aged between 31 and 40 years old. In this study, more than half of the respondents (77.6%) were single while the remaining were married (22.4%). Regarding education level, more than half of the respondents graduated from middle and high school (227), 23.2% were certificate holders, 10.4% had degrees, and 5.9% claimed they did not have any proper education.

With regard to the occupational status of the respondents, over 65% of the respondents were unemployed or students. The second largest occupational group was in the private sector (20.3%), this was followed by government employees (6.4%), and the self-employed (3.7%). Based on the findings of this study, the largest group totalling 258 respondents reported having no income. Meanwhile, 11.5% earned less than RM1,000.00, 7.5% earned between RM1,501.00 and RM2,000.00, 4.3% earned between RM1,001.00 and RM1,500.00, and 7.9% earned more than RM2,001.00 for their monthly income. On the other hand, 55.7% of respondents did not have a driving license while 44.3% did. When asked about motorised vehicle ownership, 58.7% claimed they did not own any vehicles and the remaining 41.3% said they owned at least one automobile. Most respondents (167) only used the services occasionally and 208 respondents stated they used it at least once a week.

Table 5: Frequency analysis on respondents' demographic background

Demographic Items	Variations	Frequency	Percentage (%)
Gender	Male	136	36.3
	Female	239	63.7
Age (years old)	< 20	208	55.5
	21-30	74	19.7
	31-40	13	3.5
	41-50	27	7.2
	51-60	16	4.3
	> 61	37	9.9
Marriage status	Single	272	72.5
	Married	84	22.4
	Single father/mother	19	5.1
Education level	No	22	5.9
	PT3/PMR/SRP	103	27.5
	SPM	124	33.1
	STPM/Certificate/Diploma	87	23.2
	Degree/Master	39	10.4
Occupation	Private	76	20.3
	Government	24	6.4
	Self-employed	14	3.7
	Student	234	62.4
	Others	27	7.2
Income level (RM)	No income	258	68.8
	< 1,000.00	43	11.5
	1,001.00-1,500.00	16	4.3
	1,501.00-2,000.00	28	7.5
	2,001.00-2,500.00	2	0.5
	2,501.00-3,000.00	11	2.9
	3,001.00-3,500.00	6	1.6
	> 3,501.00	11	2.9
Driving license ownership	No	209	55.7
	Yes	166	44.3
Vehicle ownership	No	220	58.7
	1	109	29.1
	2	35	9.3
	> 3	11	2.9
Frequency of using the services	Sometimes	167	44.5
	1-2 days per week	53	14.1
	3-4 days per week	51	13.6
	> 4 days per week	104	27.7

Table 6: Passengers' motivations of using the free bus

Reasons	No. of Passengers	Percentage (%)
No parking available for personal vehicle	48	12.8
Services nearby to passengers' home	218	58.1
Convenient and safe to use	264	70.4
Lessen travel duration	152	40.5
Reduce travel cost	310	82.7
Higher service frequencies	95	25.3
Help to sustain environment	78	20.8
Personal vehicle used by housemate	99	26.4

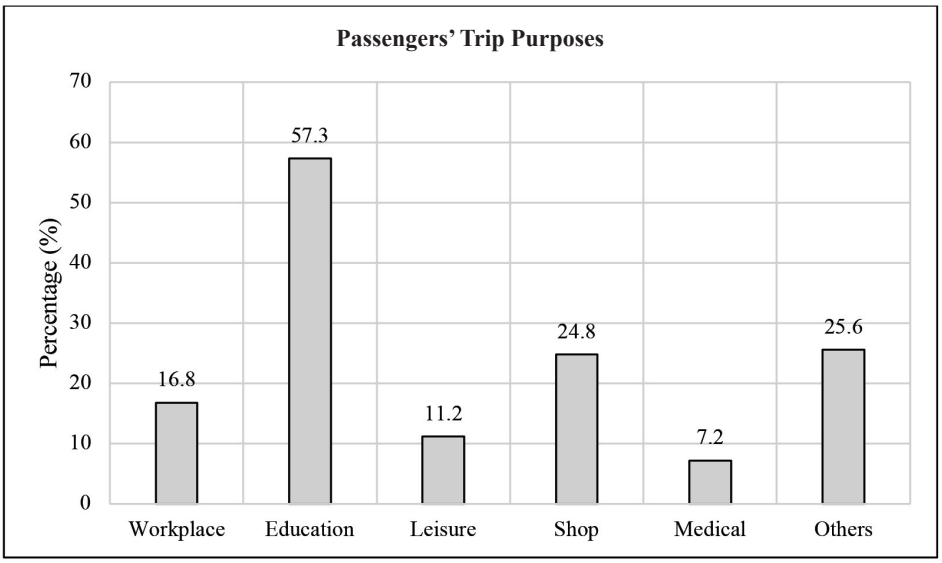

Figure 6: Passengers' trip purposes

Motivations for Using Free Bus Services

This section highlights the results extracted from Section B of the questionnaire (Table 6 and Figure 6). Table 6 emphasises the passengers' motivations and reasons for using the free bus services. The majority of passengers (82.7%) mentioned that they used the service as it was free. Additionally, 264 respondents (70.4%) noted that despite the service being free, it was convenient and safe. Moreover, 58.1% of respondents stated that they used the free bus service because it was near to their homes. Only 78 respondents (20.8%) used the service for environmental concerns, suggesting that the service is not used for environmentally conscious reasons, instead it is primarily used for other reasons.

Meanwhile, Figure 6 illustrates the purposes for which the passengers travel via the free bus service. Over 50% of respondents stated that the services were used for educational purposes (travel to and from school or university), 24.8% for shopping, 16.8% for commuting to work, 11.2% for leisure, and 7.2% for visiting nearby healthcare facilities. These results indicate that the research conducted by Ryabchikov *et al*. (2022) is still applicable. Public buses, whether

with or without a travel fare can cause more people to engage with different sectors of the economy such as healthcare, education, retail, housing and communal services, and leisure activities.

Correlation Analysis

Table 7 presents a summary of Spearman's Rho correlation analysis between passengers' demographic and their reasons for using the free bus service. The results showed that the correlation strength between the two variables is low, with most showing a low correlation, and only one showing a moderate correlation. This suggests that the passengers' demographic background generally does not significantly influence their reasons for using the free bus service. Regardless of the passengers' social status, they appear to use the service for its availability, rather than factors related to their demographic profiles. Hence, the results failed to showcase a high correlation coefficient value between the variables.

There is a moderate negative correlation value of -.332** between age and the service being near passengers' homes, which shows that young passengers were more likely to use the service for this reason alone. In addition, young passengers may choose to travel via public transport because they are not in a rush and have time to walk to the nearest terminals or stops as reported by Abdul Sukor *et al*. (2021). The same results were seen with occupations (.204**), income levels (-.265**), and frequency of public transport use (.269**), which shows a low correlation value. The free service attracted more passengers and seemed to benefit certain groups of people such as students and the elderly.

In terms of the lack of parking space, only income levels and vehicle ownership show a low correlation strength. This is mainly because of high parking fees and passengers who do not own any vehicles are the ones that tend to use the service. This finding is similar to that of Zakaria and Mohd Noor (2020). Using free bus service, allows passengers to reduce their monthly expenses and this is borne out by the low correlation between passenger occupations and income levels, towards reducing travel costs. Although these results have a low correlation value, the correlation between them still exists.

Discussion

Based on the results of this study, it is proven that demographic background significantly influences the characteristics of passengers using the free bus service. As an example, females are more likely to use public transport compared to males who typically commute by car. This preference is supported by research from Cats *et al*. (2017) and Pirra *et al*. (2021). On the other hand, young passengers prefer to use free bus services when compared with the elderly, possibly because public buses serve as social hubs for young people who are often unemployed or underemployed and have lower incomes. Thus, they are forced to rely on public transport as the less expensive option (Liu *et al*., 2021; Ye & Shyr, 2023).

As shown in this study, married individuals are less interested in using the free bus service. This finding is similar to that of the research by Rasca and Saeed (2022) and Yang *et al.* (2023), indicating married people prefer using their own vehicles owing to household obligations that extend travel times, especially for male spouses. Students are frequent passengers of these services as they ease travel burdens and exhaustion due to walking (Bull *et al*., 2021).

Moreover, passengers with no income are more likely to use the free bus service because private vehicles require monthly expenditure for maintenance and fuel, which are often expensive and unaffordable to lower-income groups. Hence, public transport provides an alternative that eases the mobility issues faced by those with modest incomes. Fluctuations in fuel prices also serve as a major reason for people to shift to public transport (Nasrudin *et al*., 2014; Aljoufie, 2019). This study reaffirms that most passengers prefer the free bus service for its zero fare convenience, which aligns with the findings from previous studies by Widiyani

Table 7: Correlation analysis result based on passenger demographic item and motivations using free bus services

Demographic Item	Spearman's Rho Coefficient							
	No Parking Available	**Services Nearby to Passengers' Home**	**Convenient and Safe to Use**	**Lessen Travel Duration**	**Reduce Travel Cost**	**Higher Service Frequencies**	**Help to Sustain Environment**	**Personal Vehicle Used by Housemate**
Gender	-.159**	.023	.070	.058	.021	-.045	-.051	-.039
Age	.087	-.332**	.052	-.122*	-.164**	-.052	-.150**	-.039
Marital status	.050	-.172**	.146**	-.117*	-.077	.016	-.097	-.061
Education level	.166**	-.094	.053	.056	-.139**	.133**	-.098	.094
Occupation	-.106*	.204**	-.101	-.019	.235**	-.052	.087	-.079
Income level	.232**	-.265**	.095	-.035	-.235**	.090	-.017	.111*
Driving license ownership	.189**	-.190**	.013	-.047	-.102*	-.124*	-.086	.148**
Vehicle ownership	.287**	-.088	.073	-.071	-.119*	.024	.079	.217**
Frequency of using	-.120*	.269**	.007	.089	.133*	.106*	-.065	-.026

Note: ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Low correlation
Moderate correlation

(2020), who found that higher parking rates will end up making road users choose public buses. Furthermore, transiting via a public bus can alleviate the journey, as proven by Wang and Liu (2015), who found that most of the staff at the University of Queensland, Australia choose to travel stress-free by bus. The burden of remaining focused while driving in traffic may trigger the stress level of certain individuals.

Last but not least, there is a strong relationship between having a driving license and owning a vehicle, which explains the minimal difference in responses indicating "No". Logically, when one does not own a driving license, one cannot own any motorised vehicles, as driving without a license is considered illegal. Therefore, these people will often resort to active transportation methods such as walking or cycling, as well as public transportation services. For example, people who do not own any vehicles tend to rely on public transport and non-motorised modes of transport (Zakaria & Mohd Noor, 2020).

Conclusions

It is evident that the main characteristics of passengers using the free bus services are typically female, young, single, graduated from high school, with no income, and having neither driving nor vehicle ownership. Many passengers use the service occasionally while others rely on it daily. The most significant reasons to travel via the free bus service are to reduce travel costs and parking fees as well as personal vehicle maintenance and fuel consumption. Although only a minority openly declare environmental concerns as a reason for using free bus services, many passengers contribute to sustainability without realising it. The low correlation analysis result also indicates that every passenger uses the free bus services regardless of their demographic background, driven purely by personal preferences rather than social status. This study also hopes that the free bus service initiative should be studied in more detail, covering more areas across Malaysia to achieve sustainable development in the public transport space.

As an example, the Johor Public Transport Corporation is a great model of how free bus services in the state are well-managed with one central authority overseeing operations instead of separate city and municipal councils. This approach ensures uniformity of service and allows passengers to experience greater equality, supporting the country's goal of sustainable development. In large cities like the Klang Valley where free bus services are already in place, collaborative efforts should be made between city and municipal councils, the government, and public transport providers to enhance ridership through integrated strategies and policies. Improving the service quality of public transport is crucial to attract more local passengers by ensuring reliability, comfort, and convenience for all commuters. Policy wise only allowing MyKad holders to use the services should have been implemented for every free bus service in the country to gain more local passengers. This effort should have grown continuously to align with the National Key Result Areas' goal of reaching a 40% mode share by 2030. Additionally, increasing bus frequency is necessary to reduce the use of personal vehicles; thereby, mitigating the environmental impact of motorised vehicles.

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Conflict of Interest Statement

The authors agree that this research was conducted without any commercial or financial conflicts and declare that there are no conflicts of interest with the funders.

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