INTI JOURNAL | eISSN:2600-7320
Vol.2022:19

Customer Satisfaction on Public Transportation in Penang, Malaysia

Sobanah Dhevi Tharmalingam[1], Sai Mei Ling[2,*], Vikniswari Vija-Kumaran[2], Kalai Vani Kalimuthu[2], & Suresh Nodeson[2]

[1]Faculty of Business, Segi University and College Kota Damansara, Malaysia
[2]Faculty of Business and Finance, Universiti Tunku Abdul Rahman, Kampar, Perak, Malaysia

[*]**Email**: saiml@utar.edu.my

Abstract

This paper examines customer satisfaction with public transportation services in Penang, Malaysia. Four factors, reliability, accessibility, safety, and security, were used to measure satisfaction with the Rapid Penang bus service. A survey of 500 bus passengers was conducted using a structured questionnaire. The results indicate that reliability, accessibility, safety, and security all have a significant positive impact on customer satisfaction. This study contributes to a better understanding of which service factors most effectively enhance passenger satisfaction, enabling providers to improve their offerings and build greater trust among users.

Keywords

Customer satisfaction, Reliability, Accessibility, Safety and security, Public transportation, Bus service.

Introduction

The passenger transportation industry in many countries has undergone significant upgrades to improve convenience for commuters. Public transportation remains popular among the population due to its affordability and ease of access. According to *The Star* (2016), Malaysia was ranked 4th among the world's 45 leading emerging markets in logistics, demonstrating its capacity and ambition to develop world-class infrastructure and transport networks. Malaysia aimed to become "The Preferred Logistics Gateway for Asia" by 2020 through the implementation of five strategic shifts and 19 action items to strengthen its transport infrastructure.

In Penang, a state experiencing steady population growth, the demand for transportation services is increasing correspondingly. As the cost of living rises, residents are encouraged to mitigate traffic congestion by shifting to public transportation, especially during peak hours. This research proposes recommendations to address traffic congestion and enhance travel efficiency through the adoption of the 'hub and spoke' transport system. This approach requires the reorganization and optimization of transport modes and linkages at Penang Central. Moreover, public transport usage can help minimize time loss and transportation costs. The present study aims to examine the relationship between reliability, accessibility, and safety and security, and

Submission: 14 March 2022; **Acceptance:** 15 April 2022

their influence on customer satisfaction with the Rapid Bus service in Penang, Malaysia. Penang was selected for this study due to its high population density, status as one of Malaysia's most urbanized states, and its prominence as a tourist destination. According to *CNN* (2019), Penang was recognized as one of the top tourist destinations to visit in 2019.

In the field of marketing, customer satisfaction is a critical construct (Singh & Kumar, 2014). Wilson et al. (2012) define customer satisfaction as a client's assessment of a product or service, particularly whether it meets the client's needs and expectations. Multiple factors influence customer satisfaction, including product quality, fairness perceptions, pricing, individual preferences or emotional states, and the influence of other customers. Oliver (2010) describes customer satisfaction as a reaction of fulfillment, wherein a product or service delivers a pleasurable experience during use, meeting or exceeding expectations. Noor et al. (2013) highlight that consumer satisfaction is essential across all service sectors. Chen (2008) emphasizes that satisfied customers are more likely to make repeat purchases, engage in positive word-of-mouth, and contribute to company growth. Furthermore, Manani et al. (2013) assert that measuring customer satisfaction offers insights into organizational performance, making it a critical success metric for both private and public sector services.

Reliability

Creswell (2003) defines reliability as the consistency of measurement results when repeated under similar conditions, thereby reflecting the stability of outcomes. Stenbacka (2001) regards reliability as the basis for generating understanding through systematic explanation in research. Reliability refers to the consistency of an instrument or service, often implying repeatability. In the context of public transportation, reliability should be viewed through the lens of social equity—emphasizing convenience, safety, and affordability to optimize public access (Bates et al., 2001; Redman et al., 2013; Li et al., 2010).

Kabir and Carlsson (2016) define reliability as the ability to deliver promised services accurately and dependably. In public transport, reliability encompasses service speed and transaction accuracy. Consistent service delivery—in terms of punctuality, performance, and error-free operations—is a key expectation among commuters. Sudaryanto and Kartikasari (2007) argue that improved infrastructure, upgraded vehicles, and efficient scheduling, such as dedicated bus lanes, can significantly enhance service reliability and operational efficiency. However, the interpretation of reliability varies depending on the discipline and context (Cscanada.net, 2016). For example, Li et al. (2010) investigated the implementation of 40 'Superoute' bus lines in Tyne and Wear, UK, and found that fare reductions significantly improved public perceptions of transport quality.

Meyer (2002) reports that transport system performance—especially user satisfaction—is closely tied to factors such as travel time, speed, safety, delays, and travel costs. Cavana et al. (2007) also found that reliability and travel time significantly affect customer satisfaction. Reliable and convenient transportation plays a crucial role in improving user experience. Currie and Wallis (2008) provided a comprehensive review of effective strategies to expand urban bus markets, including network design, service frequency, infrastructure, fare and ticketing systems, passenger information, personal safety, and the synergistic effects of these variables.

Accessibility

Accessibility is generally defined as the extent to which users can obtain goods or services when needed (BusinessDictionary.com, 2016). Rodrigue (2016) describes it as the ability to reach a location or access other destinations. Litman (2011) emphasizes two aspects of accessibility: location and the individual's capacity to travel. Islam et al. (2014) highlight that accessibility concerns not only the availability of tickets and bus stops but also the overall ease of use. When accessibility is reduced, traffic congestion may increase, although it may simultaneously reduce environmental externalities such as vehicle noise. Accessibility depends on factors like time, cost, and travel feasibility (Gwilliam, 2017).

According to Thompson and Schofield (2007), ease of access to destinations significantly contributes to customer satisfaction. Their study found that even when other factors such as time and safety were suboptimal, the ability to reach one's destination remained a primary driver of satisfaction. Bramey and Wuppertal (2008) state that accessibility in public transport must prioritize convenience for surrounding communities. In the banking sector, Muluka et al. (2015) liken accessibility to users' ability to reach financial services, facilities, and feedback channels, arguing that accessibility directly influences customer satisfaction.

Islam et al. (2014) conducted a study at Universiti Utara Malaysia (UUM) to examine the relationship between accessibility and customer satisfaction with public bus services. Using convenience sampling, 300 questionnaires were distributed among UUM students who frequently used HBR buses in Sintok. The findings indicated a significant and positive relationship between accessibility and customer satisfaction, reinforcing its importance in public transport planning.

Safety and Security

Mercer and Williams (2014) define security as both a physical and emotional state of safety. Redman et al. (2013) add that security also encompasses emotional well-being, while Savage (2013) emphasizes the importance of vehicle safety features, such as locks, airbags, and crash resistance. Eboli and Mazzulla (2010) distinguish between the two terms: "security" pertains to protection from criminal acts, while "safety" refers to protection from accidents. Lengyel (2012), referencing Maslow's hierarchy of needs, identifies safety and security as essential components of customer satisfaction.

Past research has linked product safety directly to customer satisfaction and brand loyalty (Chalotra, 2012). Improving safety enhances customer confidence, increases repeat patronage, and boosts business revenue. Smith (2013) stresses that customer satisfaction can be improved through quality safety protocols, competitive pricing, and safe working environments. According to the National Safety Council (NSC, 2015), 35,200 people died in traffic accidents in the U.S. in 2013, underscoring the importance of safety measures to prevent such outcomes.

A study by Albonaeimi and Hatami (2015) explored customer satisfaction within the airline sector, specifically focusing on Zagros Airlines. In this study, 380 questionnaires were distributed and analyzed using regression techniques. The results revealed a positive and statistically

significant relationship between safety, security, and customer satisfaction, reaffirming the role of these factors in influencing consumer perceptions across transportation sectors.

Methodology

Questionnaires were distributed to investigate the relationship between reliability, accessibility, safety and security, and customer satisfaction among bus passengers in Penang. According to Sekaran and Bougie (2009), the population refers to the entire group of people, events, or items of interest to the researcher, while the sample represents a subset of that population. Based on the sample size determination procedure proposed by Krejcie and Morgan (1970), a minimum of 384 respondents is required for a population of 1.69 million, assuming a 95% confidence level and a 5% margin of error.

However, due to the absence of a comprehensive sampling frame, a convenience sampling technique—a type of non-probability sampling—was employed. A total of 500 questionnaires were distributed to bus passengers in Penang. Of these, 405 valid responses were received and included in the analysis. The questionnaire employed a five-point Likert scale, ranging from 1 (strongly agree) to 5 (strongly disagree), as adopted from Geoff (2010).

The questionnaire was divided into three sections. Section A collected demographic data. Section B contained items related to the independent variables: reliability, accessibility, and safety and security. Section C focused on the dependent variable: customer satisfaction. The measurement instruments for each construct were adapted from previous research to ensure validity and reliability. The conceptual framework guiding this study is illustrated in Figure 1.

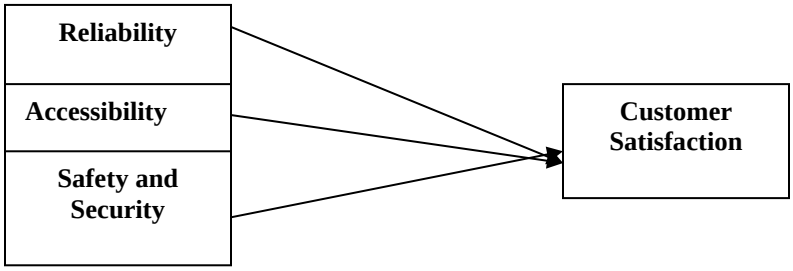

Figure 1. Conceptual Framework

Results and Discussion

To conduct the study, 500 self-administered questionnaires were distributed to bus passengers in Penang. Out of these, 405 were returned with valid and complete responses, yielding a valid response rate of approximately 81%. The remaining questionnaires were excluded due to incomplete answers, particularly where respondents selected only the neutral option throughout.

Descriptive statistics were used to analyze the demographic characteristics of the respondents, including gender, age, and income. As shown in Table 1.1, 47.8% of respondents were male, while 52.1% were female. Approximately 42.9% were aged between 18 and 25 years. Most respondents reported a monthly income in the range of RM1000–RM1500. Regarding occupation, 56.3% of the respondents selected "Others." Ethnically, the highest number of respondents were Indian, accounting for 44.3% of the sample.

Table 1. Response Rate (%) for each Variables according to Scale

Variables	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Tourism	25.1	42.4	13.1	13.6	5.6
Reliability	16.9	39.6	19.4	16.1	7.7
Accessibility	22.7	42.2	17.2	13.5	4.2
Safety and Security	20	42.1	13	17.7	7

From the data collected, 67.5% of respondents either agreed or strongly agreed that they were satisfied with the bus service, while 13.1% remained neutral. In contrast, 19.2% expressed dissatisfaction (13.6% disagreed, and 5.6% strongly disagreed). These results indicate a generally positive level of satisfaction with the bus services.

Regarding reliability, 16.9% of respondents strongly agreed and 39.6% agreed that Rapid Bus services were reliable. However, 19.4% remained neutral, 16.1% disagreed, and 7.7% strongly disagreed, indicating that while the majority viewed the service as dependable, there is room for improvement.

For accessibility, 22.7% of respondents strongly agreed and 42.2% agreed, suggesting a favorable perception of access to the bus service. Still, 17.2% chose neutral, while 13.5% disagreed and 4.2% strongly disagreed. These results affirm that accessibility remains a strength of the Rapid Bus system.

In terms of safety and security, 20.0% of respondents strongly agreed, and 42.1% agreed. About 13.0% selected neutral, whereas 17.7% disagreed and 7.0% strongly disagreed. While the majority of users felt safe using the service, a notable minority raised concerns about safety and security measures.

The results from hypothesis testing indicate a positive and significant relationship between reliability, accessibility, and safety and security and customer satisfaction. These findings suggest that improvements in these three service dimensions could directly contribute to increased customer satisfaction with public bus services in Penang.

Discussion

The findings of this study indicate that although passengers are generally satisfied with the bus service—particularly in terms of accessibility and safety and security—their responses show lower

satisfaction with the reliability of the service. It was also found that individuals from lower-income groups tend to rely more on public transport. A reduction in public transport usage could result in increased reliance on socially and economically unsustainable modes of transportation.

The first hypothesis tested revealed that reliability has a positive and significant effect on customer satisfaction. This suggests that the ability of management to provide convenient, safe, and affordable services significantly impacts user satisfaction. These results are consistent with the findings of Li et al. (2010), who emphasized the influence of lower fares and high service quality on public transport user satisfaction.

In addition, accessibility was found to have a positive and significant relationship with customer satisfaction. Customer satisfaction with transportation services depends on the ability to access those services conveniently, a conclusion supported by the findings of Chowdhury, Islam, et al. (2014).

The third hypothesis showed that safety and security also have a positive and significant effect on customer satisfaction. Safety and security influence emotional responses, which are critical in shaping customer perceptions. This finding aligns with prior research conducted by Albonaeimi and Hatami (2015) on airline customer satisfaction.

Overall, the results suggest that reliability, accessibility, and safety and security significantly affect customer satisfaction with Rapid Penang bus services. However, more attention should be given to improving the reliability of services to enhance overall user satisfaction. High-quality public bus transport not only retains existing users but can also attract new passengers. These results contribute to a broader understanding of open transportation systems in Malaysia and may guide transport authorities in implementing effective policies and service improvements across various states.

Conclusions and Recommendations

This study concludes that reliability, accessibility, and safety and security are significant predictors of customer satisfaction with the Rapid Penang bus service. While accessibility and safety and security received generally favorable responses, reliability emerged as a relatively weaker area in terms of customer perception. Improving service reliability should therefore be a priority for enhancing the overall satisfaction and ridership of public transportation.

High-quality bus services play a crucial role not only in meeting current passengers' transportation needs but also in attracting new users, thereby reducing congestion and promoting sustainable travel behaviors. Thus, the findings of this investigation provide valuable insights that can be used to support strategic transportation planning and policy formulation aimed at improving public transportation across Malaysian states.

Acknowledgements

Not applicable.

References

Albonaeimi, E., & Hatami, M. (2015). Study of the effect of service quality on customer satisfaction (Case study: Zagros Airlines). *International Journal of Innovation and Research in Educational Sciences, 2*(4). ISSN (Online): 2349–5219.

Bates, J., Polak, J., Jones, P., & Cook, A. (2001). The valuation of reliability for personal travel. *Transportation Research Part E: Logistics and Transportation Review, 37*(2–3), 191–229. https://doi.org/10.1016/S1366-5545(00)00011-9

BusinessDictionary.com. (2016). What is accessibility? Definition and meaning. Retrieved April 24, 2022, from http://www.businessdictionary.com/definition/accessibility.html

Cavana, R., Corbett, L., & Lo, Y. (2007). Developing zones of tolerance for managing passenger rail service quality. *International Journal of Quality & Reliability Management, 24*(1), 7–31. https://doi.org/10.1108/02656710710720303

Chalotra, V. (2012). Customer satisfaction regarding small scale industries products. *International Journal of Engineering and Management Research, 2*(2), 2249–2585.

Chen, C. (2008). Investigating structural relationships between service quality, perceived value, satisfaction, and behavioral intentions for air passengers: Evidence from Taiwan. *Transportation Research Part A: Policy and Practice, 42*(4), 709–717. https://doi.org/10.1016/j.tra.2008.01.007

CNN Travel. (n.d.). Spring travel: 19 places. *CNN*. Retrieved April 24, 2022, from https://edition.cnn.com/travel/article/spring-travel-19-places/index.html

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Sage Publications.

Cscanada.net. (2016). *Cross-cultural communication: Volume and issue unspecified*. Retrieved April 24, 2022, from http://cscanada.net/index.php/ccc/article/download/j.ccc.1923670020100602.010/992

Currie, G., & Wallis, I. (2008). Effective ways to grow urban bus markets – A synthesis of evidence. *Journal of Transport Geography, 16*(6), 419–429. https://doi.org/10.1016/j.jtrangeo.2008.04.007

Eboli, L., & Mazzulla, G. (2010). How to capture the passengers' point of view on a transit service through rating and choice options. *Transport Reviews, 30*(4), 435–450. https://doi.org/10.1080/01441640903068441

Fujii, S., & Kitamura, R. (2003). What does a one-month free bus ticket do to habitual drivers? An experimental analysis of habit and attitude change. *Transportation, 30*, 81–95.

Gwilliam, K. (2017). Transport pricing and accessibility. Brookings. Retrieved January 10, 2022, from https://www.brookings.edu/research/transport-pricing-and-accessibility/

Imam, R. (2014). Measuring public transport satisfaction from user surveys. *International Journal of Business and Management, 9*(6), 106–114. https://doi.org/10.5539/ijbm.v9n6p106

Islam, R., Chowdhury, M. S., Sarker, M. S., & Ahmed, S. (2014). Measuring customers' satisfaction on bus transportation. *American Journal of Economics and Business Administration, 6*(1), 34–41.

Jansen, R. S., van Leeuwen, A., Janssen, J., Conijn, R., & Kester, L. (2020). Supporting learners' self-regulated learning in massive open online courses. *Computers & Education, 146*, Article 103771. https://doi.org/10.1016/j.compedu.2019.103771

Kabir, M., & Carlsson, T. (2016). Expectations, perceptions and satisfaction about service quality at Destination Gotland [E-book].

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Li, Z., Hensher, D., & Rose, J. (2010). Willingness to pay for travel time reliability in passenger transport: A review and some new empirical evidence. *Transportation Research Part E: Logistics and Transportation Review, 46*(3), 384–403. https://doi.org/10.1016/j.tre.2009.12.005

Litman, T. (2011). Measuring transportation traffic, mobility and accessibility. *ITE Journal, 73*(10), 28–32.

Manani, T. O., Nyaoga, R. B., Bosire, R. M., Ombati, T. O., & Kongere, T. O. (2013). Service quality and customer satisfaction at Kenya Airways Ltd. *European Journal of Business and Management, 5*(17), 170–179.

Mercer, S., & Williams, M. (2014). *Multiple perspectives on the self in SLA*. Multilingual Matters.

Meyer, M. D. (2002). Measuring system performance: Key to establishing operations as a core agency mission. *Transportation Research Record: Journal of the Transportation Research Board, 1817*(1), 155–162. https://doi.org/10.3141/1817-20

Muluka, K. O., Kidombo, H., Munyolo, W., & Oteki, E. B. (2015). Accessibility of digital banking on customer satisfaction: National Bank of Kenya. *Journal of Business and Management, 17*(11), 48–54.

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. *Advances in Health Sciences Education, 15*(5), 625–632. https://doi.org/10.1007/s10459-010-9222-y

Noor, N. M., Arshad, A. K., Mohd Jais, I. B., & Mustafa, M. (2013). An analysis of user satisfaction on public transport terminal based on users' survey. Paper presented at the International Postgraduate Seminar 2013, Shah Alam, Selangor, Malaysia.

Oliver, R. L. (2010). *Satisfaction: A behavioral perspective on the consumer* (2nd ed.). M. E. Sharpe.

Redman, L., Friman, M., Gärling, T., & Hartig, T. (2013). Quality attributes of public transport that attract car users: A research review. *Transport Policy, 25*, 119–127. https://doi.org/10.1016/j.tranpol.2012.11.005

Rodrigue, D. (2016). Transportation and accessibility. Hofstra University. Retrieved April 24, 2022, from https://people.hofstra.edu/geotrans/eng/methods/ch2m1en.html

Savage, I. (2013). Comparing the fatality risks in United States transportation across modes and over time. *Research in Transportation Economics, 43*(1), 9–22. https://doi.org/10.1016/j.retrec.2012.12.011

Sekaran, U., & Bougie, R. (2009). *Research methods for business: A skill building approach* (5th ed.). Wiley.

Singh, B., & Kumar, D. (2014). Customer satisfaction analysis on services of Delhi Metro. *Asian Journal of Multidisciplinary Studies, 2*(1), 124–130.

Smith, C. (2013). What are the recommended strategies to use to improve customer satisfaction? *Small Business – Chron.com*. Retrieved February 8, 2022, from https://smallbusiness.chron.com/recommended-strategies-use-improve-customer-satisfaction-20723.html

Stenbacka, C. (2001). Qualitative research requires quality concepts of its own. *Management Decision, 39*(7), 551–556. https://doi.org/10.1108/EUM0000000005801

Sudaryanto, & Kartikasari, R. (2007). The measurement of the service quality of TransJakarta Busway public transportation. In *Proceedings of the International Seminar on Industrial Engineering and Management* (pp. E45–E51). Menara Peninsula, Jakarta.

The Star. (2016, January 19). Malaysia ranked 4th in emerging market logistics. Retrieved April 24, 2022, from https://www.thestar.com.my/business/business-news/2016/01/19/malaysia-ranked-4th-in-emerging-market-logistics/

Thompson, K., & Schofield, P. (2007). An investigation of the relationship between public transport performance and destination satisfaction. *Journal of Transport Geography, 15*(2), 136–144. https://doi.org/10.1016/j.jtrangeo.2006.11.004

Winzer, P., Fiedrich, S., Degenhart, T., Projekt, & Ratioparts. (2008). Customer satisfaction in local passenger transport considering safety sensation. *Yearbook as applicable*, pages unspecified.

Wilson, A., Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. (2012). *Services marketing: Integrating customer focus across the firm* (2nd European ed.). McGraw-Hill.