Journal of Engineering Research and Applied Science
Available at www.journaleras.com
Volume 12 (1), June 2023, pp 2277-2284
ISSN 2147-3471 © 2023

The Effect of Public Transport Services on Quality of Life a Case Study on Road Section from Dhulikhel to Ratnapark

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Accepted 10 May 2023

Abstract

Public transportation is essential for public transport users as it comprises all transport facilities in which passengers do not use their personal means of transportation to travel. Public transportation performs a lot of functions which helps passengers in different form. It enhances the quality of life in societies on condition that it provides safe, efficient and inexpensive transportation services. A good public transport system makes efficient use of urban space, provide efficient and affordable mobility, and access to work, school/colleges, social, recreation and economic activities. This paper mainly focus on the study of effects of the public transport services in the quality of life of the public transport road users. The effects of public transport on the quality of life of road users are measured in the terms of servqual dimension i.e. Empathy dimensions, Reliability dimension, Responsive dimension, Tangible dimension and Comfort dimension. The gap between the expectation and perception were analyzed to determine the effects on the quality of life. From the study it was observed that the public perception of public transport services with indicators insurance, empathy, reliability, responsive, tangible and comfortable is very low in giving the good service to the passengers.

Keywords: *Public Transportation, Quality of life, servqual attributes, expectation, perception and gap.*

1. Introduction

Public transportation comprises all transport facilities in which passengers do not use their personal means of transportation to travel. It includes taxis, mini buses, and buses. Public transportation is of essence to passengers, due to the fact that it offers opportunity to move from one location to the other location with ease. Public transportation performs a lot of functions which helps passengers in different form. It enhances the quality of life in societies on condition that it provides safe, efficient and inexpensive transportation services. Besides, the ease of use (availability) and cost effectiveness of public transport services is imperative to guaranteeing a resilient economy and improving mobility. Societies also benefits from the availability of public transportation services such that it lessens traffic congestion on our roads, saves money and creates and sustain jobs within communities. A good public transport system makes efficient use of urban space, provide efficient and affordable mobility, and access to work, school/colleges, social, recreation and economic activities.

Numbers of people travel daily basis for different purposes like for educations, jobs, shopping and many more purposes. So in such case public transport play important role. It is necessary to assess the performance of public transport service based on passenger satisfaction. Public transport is significant for the economic growth and economic development since it facilitates the movement of labor, raw materials, finished commodities and creation of employment in the economy. It is necessary to find different factors that public transportation would affect to maintain the quality of life. The usage of public transport can offer many benefits, people should not have negative attitudes towards public transport. The negative attitude arises when the level of service is less which directly affects the quality of life of public in terms of reliability, comfort, tangible, responsiveness, empathy. So this study helps to find gap between perception and expectation on public transport and the effects of public transport on their quality of life.

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2. Literature Review

Public transport (PT) is available for use by anyone who pays the set fares. It generally operates on fixed routes and may include modes such as three-wheelers, mini/micro buses, buses, trolleybuses, trams, trains and ferries. Besides reducing congestion and air pollution by providing transportation services to a large number of people, high capacity public transport systems may also influence the urban form and quality of life in cities. A good public transport system makes efficient use of urban space, provide efficient and affordable mobility, and access to work, school/colleges, social, recreation and economic activities. A standard bus occupies the same space that of two cars but carries almost forty times more passengers.

Shifting from private motorized transport to rapid transit/public transport, such as rail, metro and bus, is associated with a wide range of potential health and climate benefits, including: lower urban air pollution concentrations, lower rates of traffic injury risk, less noise stress and improved equity of access for people without cars. By clustering many passengers together in one vehicle, public transport modes reduce total traffic emissions of climate and air pollutants. Public transport use is also associated with more physical activity and less obesity, since public transport services are often accessed by walking and cycling. Strong public transport systems tend to have the advantage of reducing traffic intensity, which is associated with road traffic injuries and noise-related health impacts. In developed countries, for instance, the injury risk for public transport users is much lower than the risk for car users. Investment in mass public transport can also yield equity benefits by improving the mobility of women, elderly and the poor, who often lack access to private vehicles. This, in turn, provides employment, education, health services and recreational [1].

2.1. Service quality

Quality as defined for higher education is identified as exceptional, consistency, fitness for purpose, value for money, and transformative (Harvey and Knight, 1996). Different studies were made on service quality in early 1980s. Service quality is a measure of how well the service level delivered matches customer expectations [2]. It has been identified two dimensions of service quality namely functional quality and technical quality. Functional quality involves the performance in which the service delivered and technical quality involves the actual outcome of the service [3].

The SERVQUAL model used in assessing service quality is determined by the size and direction of the so-called internal gaps. The gaps are defined as: Gap 1 (positioning gap) - between customer expectations and management perceptions of those expectations; Gap 2 (specification gap) - concerned with management perceptions of customer expectations and the firm's service quality specifications; Gap 3 (delivery gap) - between service quality specifications and actual service delivery by employee; Gap 4 (communication gap) - pertains to actual service delivery and external communications about the service [4]. The SERVQUAL instrument is based on Gap 5 (perception gap) is the difference between the customer's internal perception and expectation of the services [5]

The five key dimensions of service quality were reliability, responsiveness, assurance and empathy, and tangibles were the most used models for evaluating customer expectations and their perceptions of the service quality [6, 4, 7] These five dimensions are identified as follows:

- Reliability: It refers to the ability to perform the promised service dependably and accurately.
- Responsiveness: It refers to the willingness to help customers and to provide prompt service.
- Assurance: It refers to the knowledge, courtesy of employees and ability to convey trust and confidence in the customer towards the service provider.
- Empathy: It refers to the provision of caring, individualized attention provided to customers.
- Tangibles: It refers to the appearance of physical facilities, equipment, personnel and communication materials.

SERVQUAL is based on the "GAP model" of service quality which facilitates quantification of the gap between customers' expectations of a service and their perceptions of the actual service delivered. In transportation context, passenger satisfaction is created by the comparison of pre-travel expectations and post-travel experiences.

A study in Ghana on Kumasi-Accra route using binary logit model to assess 492 randomly administered questionnaires affirm that, passenger's satisfaction with public transport service is highly influenced by bus traffic safety record, comfort as well as fare and control of crime rate at the bus station. This is because

these factors seem to effect level of satisfaction of passengers on Accra-Kumasi route [8].

2.2. Level and effectiveness of public transport service

Clean Energy Nepal provides fact that there is increasing trend of private vehicles on the streets of Kathmandu. Public transportation such as micro buses, minibuses and buses are normally very crowded, comparatively expensive, and uncomfortable to stand as well as to sit in. The public transport does not have well defined travel time schedule and proper bus stops. These factors are encouraging the public to choose for private transport. Reliability of public transportation is falling day by day. The level of dissatisfaction with public transport is very high [9]. From user's perspective, four factors are vital in determining public satisfaction from transport services: Time, cost, dependability or predictability and comfortable service.

The quality of public transport service is poor and inefficient. There are no well-defined schedules, and the vehicles are generally poorly maintained, lack cleanliness, overcrowded and uncomfortable. As vehicles compete with one another for passengers, speeding is often a major concern for passenger safety, and vehicles wait for a longer time at stops resulting in vehicle stacking and congestion. A survey conducted showed that about 61.7% of female respondents said that they feel uncomfortable with the space in public transport because of overcrowding; 57.7% of passengers were not happy with the travel time in public transport; 69.1% of surveyed passengers perceived that the public transport drivers practice reckless driving making travel uncomfortable and unsafe; 24.9% passenger perceived service as unreliable; and 30.5 % of people said that they have to wait for more than 10 minutes during morning peak hour to get a ride [9].

The study also found that 26% of women of age group 19-35 stated that they had experienced inappropriate touching on public transport during the last year. Another survey of university students found that 97% of those using public transportation had experienced some form of sexual harassment [10].

Tjeedra et al (2010) studied the difference regarding perception and experience of male and female as a user of public transport from 499 copies of questionnaire distributed by simple random sampling method in three cities in Indonesia. The analysis through heterogeneous customer satisfaction index (HCSI) reveals that female tends to be more satisfied than male in experiencing the services. The index also shows that the index is location specific which explains the uniqueness of each city. Analysis also found out that each of the 15 attributes has different contribution to the overall satisfaction in each city. The contribution of each attribute is also different when male and female are compared [11].

A study in Pakistan through purposive sampling of 120 questionnaires seek to ascertain how service quality influences customer satisfaction. The multiple regression result reveals that there was a positive relationship between service quality and customer satisfaction in the public transport sector in Pakistan [12].

2.3. Service quality of public transportation

There are five major factors inherent to public transport industry, namely the measures of accessibility, reliability, comfort, convenience and safety [13]. Servqual dimensions includes reliability, responsiveness, assurance, empathy and tangible. Respondents were offered to evaluate questions on the scale from 1 – strongly disagree, to 7 – strongly agree and gaps in level of expected and perceived service quality in each dimension and an individual item of the servqual model was developed [14]. Accessibility and reliability are the top two key factors in evaluating the effectiveness of the services at the bus stop and bus terminal, and they are followed closely by the security factor. The findings also showed that the physical factor of bus stops and bus terminals is not a priority [15]. The customers' satisfaction perception in the context of bus services was measured and found many factors that influence the effectiveness of public transport [16]. The accessibility and reliability are key factors that contribute towards the ineffectiveness of public transport [17]. The quality of public transport services also affect the quality of life [18] and provide comfort to reduce stress for the passengers during the journey [19]. The perception of interviewees is lower than expected from these attributes, it can be said that the service provided is not enough. To measure this gap will be determined by the difference of the ratio of perception on the ratio of expectations of respondents to the dimensions of Public Transport services [20].

Although some research has been done regarding the effectiveness of public transportation, there are few studies regarding the dispute between the effectiveness of the use of a minibus versus that of a transit bus. The contribution of this study is to identify

the primary components of satisfaction among the users of both a minibus and a transit bus. This study showed that a minibus service is noteworthy in terms of the level of comfort and convenience that it affords its users [21]. The findings indicated that service quality variables reliability, continuous (extent of) service, safety, comfort, affordability and driver behavior influence the customer satisfaction. Pearson‟s correlation results revealed that customers (commuters) satisfaction is highly influenced by comfort. Comfort derived from the provision of comfortable seat, clean and good conditioned vehicles, reasonable entertainment and enough air circulation. Similarly, comfort, service reliability, driver behavior and safety highly influence customer satisfaction. Commuter's estimation of satisfaction involves readily availability of taxis at the stations, timely arrival at destinations and safety factors like vehicles having functioning seat belt, drivers driving cautiously and having excellent knowledge of route [22].

3. Methodology

The questionnaire survey was done to collect information of effects of public transport on the quality of life. The questionnaires are related to SERVQUAL attributes namely empathy, reliability, tangible, comfort and responsive. The gap in between expectation and perception of the public transport facilities were used to determine the effects of the public transport on the quality of life.

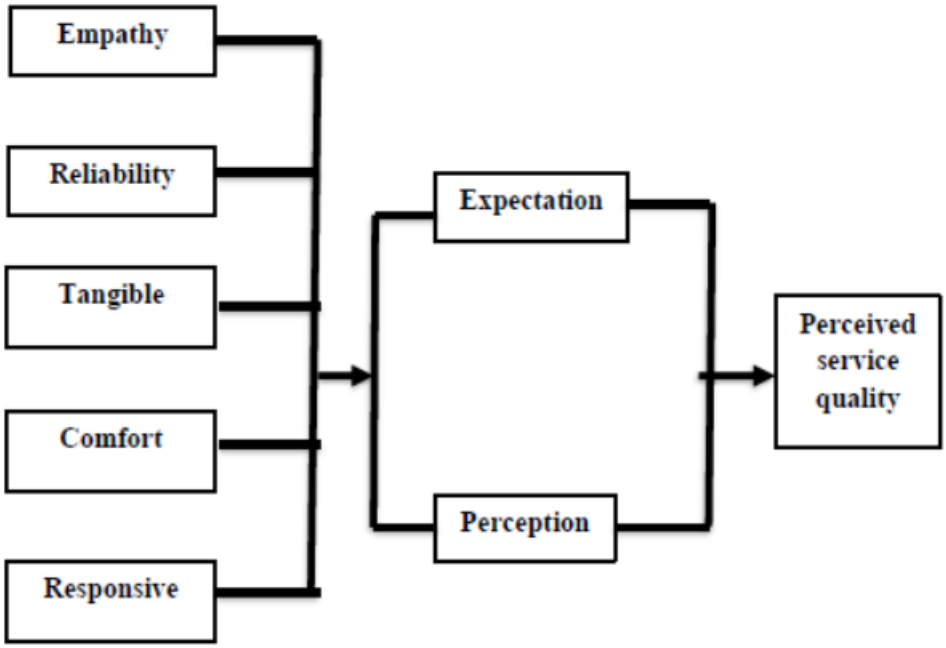

Figure 1. Conceptual frame work of the study

3.1. Study area

The area for this study is Dhulikhel to Ratnapark road section of Araniko Highway. For the questionnaire survey data collection, the locations are chosen in such a way that the all types of public modes i.e. large bus, Mini Bus, micro Bus, three wheelers tempo operate in the area so the users of all public transport modes are available. The road section from Dhulikhel to Ratnapark is around 30.2 km and passes through major settlement area, institutional area and commercial area.

3.2. Data collection

Questionnaire as a guide for the interview respondents to obtain a perception that can reveal the assessment of quality service quality and satisfaction were used. The study data in the form of qualitative were transformed into quantitative data followed by statistical analysis technique.

3.3. Primary data

Data were collected through questionnaire and the information on the five dimensions were collected. The five dimensions are:

a. Empathy dimensions

- Driver's concern
- Driver's understanding on passenger questions
- Driver's help for passengers

b. Reliability dimension.

- Waiting time
- Traveling time

- New information
- Complains handling system

c. Responsive dimension.

- Drivers responsive
- Quick and convenient service
- Drivers willingness in handling passengers complain

d. Tangible dimension

- The neatness and cleanliness driver
- Terminal cleanliness
- Appearance of public transport
- Hygiene in public transport

e. Comfort dimension

- Seating availability
- Comfort seating
- Public transport using AC

From above dimension following information were extracted and gap between perception and expectation was obtained.

3.4. Data analysis

The data collected from the questionnaire were analyzed to determine the passenger's satisfaction and effects of public transportation on the quality of life using statistics tool SPSS. SPSS is used for data input and analysis. This analysis contains finding from analysis using SPSS tool.

3.5. Gap analysis

These dimensions are captured in the SERVQUAL instrument which consists of different items where each items are measured on the basis of responses of two statements: the first, measures customer expectations concerning a service (E) and the second, is the perception of the actual service delivered by the firms within that service sector (P). The gap for each item is calculated as the perceptions score minus the expectations score (P - E). The results of computation were as follows:

- A positive gap score implied that expectations have been met or exceeded, service quality is perceived to be satisfied.
- A negative gap score implied that expectations have not being met, quality is perceived to be unsatisfactory.

4. Result

The questions were based on the five key determinants of service quality with SERVQUAL model which were summarized as below. Based on analysis of respondents' answers to the empathy attributes, public transport services can be calculated the mean scores and gaps in each dimension are:

Table 1. Gap scores representing customer satisfaction on Empathy Attributes

Empathy Attributes	Expectations E		Perception P		Gap
	Mean	SD	Mean	SD	E-P
Drive's concern on providing transport service is good	3.73	0.821	3.43	0.708	0.30
Drivers' understanding on passengers' question regarding public transport service are noteworthy	3.65	0.751	3.31	0.687	0.33
Drivers' help for passengers while making trip are praiseworthy	3.99	0.729	3.67	0.691	0.32
Overall	3.79	0.77	3.47	0.70	0.32

Based on the table above it can be explained that in the empathy dimensions, expectations average value of 3.79 and perception of 3.47 with a gap of 0.32 with the highest gap in the attribute is drivers' understanding on passengers' question regarding public transport service are noteworthy of 0.33 and the lowest is drivers' understanding on passengers' question of 0.77. The highest expectation is drive's concern on providing transport service is good of 0.30.

Based on the results of research on empathy dimension of public transport services, the lowest perception of 3.31 is drivers' understanding on passengers' question regarding public transport service are noteworthy, while the highest is drivers' help for passengers while making trip are praiseworthy that is equal to 3.67. Public perception on the public transportation service based on the results of research on empathy dimension is low, while the expectation is high, the gap between the expectations and perceptions of 0.32. This gap explained that the public transport service has not met the needs of the community.

Table 2. Gap scores representing customer satisfaction on dimension

Reliability Attributes	Expectations E		Perception P		Gap
	Mean	SD	Mean	SD	E-P
Bus always arrives on time	3.63	1.037	3.59	0.971	0.04
The travelling time on the public transport is not more	3.56	0.931	3.02	0.882	0.54
The complains handling system in the public transport is good	3.69	0.794	3.05	0.815	0.64
Overall	3.62	0.92	3.22	0.89	0.41

Based on the table above it can be explained that in the reliability dimensions, expectations average value of 3.62 and perception of 3.22 with a gap of 0.41 with the highest gap in the attribute is the complains handling system in the public transport is good of 0.64 and the lowest is bus always arrives on time of 0.04. The highest expectation is the complains handling system in the public transport is good of 3.62.

Based on the results of research on reliability dimensions of public transport services, the lowest perception of 3.02 is the travelling time on the public transport is not more, while the highest is bus always arrives on time that is equal to 3.59.

Public perception on the public transportation service based on the results of research on reliability dimensions is low, while the expectation is high, the gap between the expectations and perceptions of 0.89. This gap explained that the public transport service has not met the needs of the community.

Table 3. Gap scores representing customer satisfaction on tangible dimensions

Tangible Attributes	Expectations E		Perception P		Gap
	Mean	SD	Mean	SD	E-P
The clarity of information in terminal/stop is good	3.84	0.771	3.32	0.677	0.52
The hygiene in public transport is raise worthy	3.88	0.905	3.07	0.875	0.81
The terminal cleanliness is good	3.87	0.770	3.16	0.858	0.71
The appearance of public transport is worst	3.13	0.937	3.31	0.784	-0.18
The neatness and cleanliness of driver is good	3.80	0.735	3.32	0.733	0.48
The availability of the first aid facilities for accident is noteworthy	3.99	0.850	3.14	1.111	0.85
Overall	3.75	0.83	3.22	0.84	0.53

Based on the table above it can be explained that in the tangible dimensions, expectations average value of 3.75 and perception of 3.22 with a gap of 0.53 with the highest gap in the attribute is the availability of the first aid facilities for accident is noteworthy of 0.85 and the lowest is the neatness and cleanliness of driver is good of 0.48. The highest expectation is the availability of the first aid facilities for accident is noteworthy of 3.99. In the attributes the appearance of public transport is worst the gap is -0.18 which means its positive impacts on the public transport users.

Based on the results of research on tangible dimensions of public transport services, the lowest perception of 3.07 is the hygiene in public transport is raise worthy, while the highest is the neatness and cleanliness of driver is good and the clarity of information in terminal/stop is good is equal to 3.32. Public perception on the public transportation service based on the results of research on tangible dimensions is low, while the expectation is high, the gap between the expectations and perceptions of 0.53. This gap explained that the public transport service has not met the needs of the community.

Table 4 Gap scores representing customer satisfaction on Comfort dimension

Comfort Attributes	Expectations E		Perception P		Gap
	Mean	SD	Mean	SD	E-P
The seat in the public transport is sufficient	3.54	1.180	2.93	1.017	0.61
The seat in the public transport is comfortable	3.24	1.044	3.23	0.818	0.02
The public transport have good AC service	3.48	0.983	2.93	1.055	0.55
Overall	3.42	1.07	3.03	0.96	0.39

Based on the table above it can be explained that in the comfort dimension, expectations average value of 3.42 and perception of 3.02 with a gap of 0.39 with the highest gap in the attribute is the seat in the public transport is sufficient of 0.61 and the lowest is the the seat in the public transport is comfortable of 0.02. The

highest expectation is the seat in the public transport is sufficient of 3.54.
Based on the results of research on comfort dimension of public transport services, the lowest perception of 0.818 is the seat in the public transport is comfortable, while the highest is the seat in the public transport is comfortable is equal to 3.23. Public perception on the public transportation service based on the results of research on comfort dimension is low, while the expectation is high, the gap between the expectations and perceptions of 0.39. This gap explained that the public transport service has not met the needs of the community.

Table 5. Gap scores representing customer satisfaction on responsive dimension

Responsive Attributes	Expectations E		Perception P		Gap
	Mean	SD	Mean	SD	E-P
Quick and convenient service in public transport	3.21	1.013	3.18	0.739	0.03
Driver shows willingness in handling complains	3.27	0.904	3.28	0.755	-0.02
Quick response of driver	3.60	0.866	3.24	0.651	0.35
Overall	3.36	0.93	3.24	0.72	0.12

Based on the table above it can be explained that in the responsive dimension, expectations average value of 3.36 and perception of 3.24 with a gap of 0.12 with the highest gap in the attribute is quick response of driver of 0.35 and the lowest is quick and convenient service in public transport of 0.03. The highest expectation is quick response of driver of 3.60.

Based on the results of research on responsive dimension of public transport services, the lowest perception of 3.18 is quick and convenient service in public transport, while the highest is quick response of driver is equal to 3.24. Public perception on the public transportation service based on the results of research on responsive dimension is low, while the expectation is high, the gap between the expectations and perceptions of 0.12. This gap explained that the public transport service has not met the needs of the community.

5. Conclusion

The results showed that the public perception of public transport services with indicators insurance, empathy, reliability, responsive, tangible and comfortable is very low in giving the good service to the passengers. The services provided by public transport significantly affects the quality of life where the aspects of quality of life is measured in the terms of perception of happiness. It was observed that the public transport service still cannot provide the happiness of life, public transport users feel uncomfortable to travel in the city. Each activity trips using public transport could increase stress for passengers. When public service transport is not good, it will be able to decrease the quality of life. Therefore, it is necessary for the transport sector development program to make an effort and policies to improve public transport service that can support the quality of life. Transport engineers need to design road infrastructure accordingly which ensure quality life of public transport users and Department of Transport Management (DoTm) need for develop policy for public transport service provider for efficient use of urban space, provide efficient and affordable mobility, and access to work, school/colleges, social, recreation and economic activities.

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