

MEASURING COMMUTERS PERCEPTIONS OF SERVICE QUALITY OF SELECTED PUBLIC BUS SERVICES IN THE CITY OF JOHANNESBURG

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ABSTRACT

The quality of public transport services receives frequent media coverage and is often the cause of civil unrest. Whilst the developed world moves towards lower car usage and higher levels of public transport use, South Africa's public transport system remains unable to provide the commuter with an attractive alternative to the private car. This paper uses a modified SERVQUAL model to consider the gap between commuters' perceptions of service quality and their expectations. The study measures five dimensions of service quality, i.e. reliability, the extent of the service, comfort, safety and affordability. These five dimensions comprise 25 attributes in total. Respondents were targeted from the Greater Johannesburg area, as the largest urban population in the country. The results indicate gaps in some of the dimensions and a number of attributes were identified as having influenced the perception of service quality significantly enough to lead to customer dissatisfaction. The study provides public transport operators and government departments responsible for the provision and subsidisation of public transport with a tool characterised by a good degree of openness and flexibility, to fit individual needs. It might also be of interest for practitioners wishing to explore the main drivers of satisfaction among transport users. Recommendations for improvement in service quality have been made.

Keyword: SERVQUAL, public transport, service quality, South Africa

1 INTRODUCTION

Transport plays a critical role in the socio-economic development of a country and is particularly important in developing countries, where mobility and accessibility is frequently constrained by inadequate levels of transport services. In South Africa, the White Paper on National Transport Policy (1996) recognised the importance of the role of public transport services, with transport policy aiming to achieve an 80:20 split between public and private

transport use. Despite this aim, set in 1996, the National Transport Masterplan of 2015 states that “Our passenger transport system is broadly inefficient and not sufficiently customer focused with poor levels of reliability, predictability, comfort and safety” (Department of Transport, 2015, pp. 8-2). The 2013 National Household Travel Survey estimates the split to be approximately 70:30 (Statistics South Africa, 2014, p. 95). If the government is to achieve the envisaged modal shift and achieve the intention of the National Development Plan to provide an integrated passenger transport system and access to opportunities for all (National Planning Commission, 2011), it will be critical to understand the current public transport service levels and the failure thereof to meet the mobility needs of the commuting public. This paper aims to investigate the gaps between consumers’ expectations and perceived levels of service quality, to enable service providers and policy makers to adequately address needs within the public transport environment.

2 LITERATURE REVIEW

Public transport in South Africa is generally regarded as being of a low standard. In the only broad-based opinion poll in the country on transport related matters, the State of Transport Opinion Poll South Africa (TOPSA) survey indicates that over a four-year period, the public is highly dissatisfied with the quality and levels of public transport and, because of this, societal needs such as mobility and accessibility remain largely unaddressed (Heyns & Luke, 2016). Evidence of this poor quality of public transport is provided by the continued high levels of usage of private motor vehicles and the low levels of uptake on government subsidised public transport (Statistics South Africa, 2014, p. 95). It is frequently suggested that implementing policy imperatives such as reducing car ownership and ownership aspirations are largely reliant on the provision of an excellent public transport system (Litman, 2017; Mulalic, Pilegaard, & Rouwendal, 2015; Barton, 2000).

In South Africa, the quality of public transport services is sufficiently low that most public transport users aim at converting to private car ownership and travel, as soon as they are able to afford it (Luke, 2016). The implication is that service quality in public transport requires considerable improvement if policies designed to achieve modal shifts from cars to public transport are to be effective.

Service quality is generally considered to be the difference between customer expectations and customer perceptions of the service. Rust and Oliver (1994) assert that the perception of service quality is based on comparison with the customer’s experience of excellence in service encounters. Service quality is therefore seen as a comparison between perceived quality of the current service and previous encounters where excellent quality was experienced. Bitner and Hubert (1994) considers service quality perceptions as a consumer’s judgment of, or impression about, an entity’s overall excellence or superiority. Essentially they define service quality as the consumer’s overall impression of the relative inferiority or superiority of the organisation and its services. Central to most definitions of service quality is relativity. The customer or consumer perception of the quality of service is based on previous experience of a similar type of service.

A review of literature identifies a variety of approaches for the measurement of service quality. Various national and international indexes have been presented that are based on customer perception and expectations (Johnson, et al., 2001; Andreassen & Lervik, 1999). Another approach is the use of Service Quality Indexes (SQI), which is based on random utility theory and discrete choice models. SQI's are centred on choice data as appose to the use customer judgments ratings (Hensher & Prioni, 2002; Hensher, et al., 2003; Eboli & Mazzulla, 2007). Customer Satisfaction Indexes (CSI) measure service quality based on user judgements conveyed through a numeric scale (Hill, et al., 2003; Eboli & Mazzulla, 2009).

The SERVQUAL methodology, developed and refined by Parasuraman et al. (1985, 1988, 1991), has been used extensively by researchers to study and measure service quality. The SERVQUAL methodology is arguably the most widely used approach across various industries to compare and measure customers' perceived service quality expectations with their perceptions of actual service experience. The SERVQUAL model has been applied to numerous industries, including banking, retailing, hospitality and tourism, hospitals, restaurants, education, local government and transport (Morton, et al., 2016; Barabino & Deiana, 2013; Awasthi, et al., 2011; Daniel & Berinyuy, 2010).

The refined SERVQUAL instrument is based on two sets (measuring perceptions and expectations) of 22 items, grouped in the following five dimensions of service quality:

Table 1 SERVQUAL Dimensions (RATER)

Service quality dimension	Definition
Reliability (R)	Ability to perform the promised service dependably and accurately
Assurance (A)	Knowledge and courtesy on the part of employees and their ability to convey trust and confidence
Tangibility (T)	Physical facilities, equipment, and the appearance of personnel
Empathy (E)	Caring, individualised attention which the organisation provides to its customers
Responsiveness (R)	Willingness to help customers and provide prompt service

Source: (Parasuraman, Valarie, Zeithaml, & Berry, 1988)

The model for service quality identifies five gaps that may cause customers to experience poor service quality (Parasuraman et al. 1985). The SERVQUAL (or service quality gap model) instrument specifically measures the gap between customers' expectation (E) of a service and their perception (P) of the actual service received, commonly referred to as Gap 5 (figure 1).

In general, most of the SERVQUAL research conducted on service quality of transport services has used the RATER dimensions of service quality or an adaptation thereof (Ojo

et al., 2014; Verma, et al., 2013; Barabino, et al., 2012; Muthupandian & Vijayakumar, 2012).

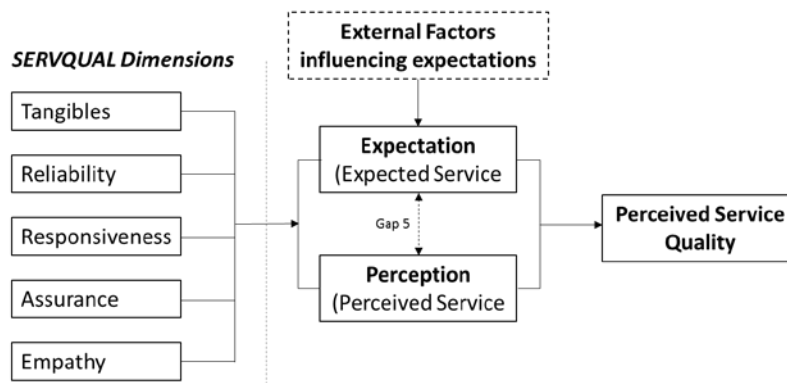


Figure 1 Measuring service quality (Kumar, Kee, & Manshor, 2009)

Too & Earl (2010) state that, while SERVQUAL is extensively used to measure service quality across various industries, the specific contexts are different which necessitates an adjustment of SERVQUAL. They further assert that the original SERVQUAL scale should merely provide a framework that should be adapted to fit the specific service being measured. This is also supported by Parasuraman et al. (1991), who opined that the SERVQUAL instrument should be refined and revised to fit specific contexts.

When considering public transport services, it is notoriously difficult to determine service quality. Wisniewski & Donnelly (1999) state that, to some extent public sector organizations have a more difficult time than their private sector counterparts, given the diversity of 'customers'. They further assert that this simply reinforces the need for public sector organizations to ensure that they are providing quality services that match customer expectations as closely as possible (Wisniewski & Donnelly, 1999). When considering public transport, it is particularly important to determine service expectations and meet these, as when they are not met, customers are likely to resort to the alternative of using their own cars. As it is a policy imperative within the country to create a transport system that is public transport rather than car centric (Department of Transport, 1996), it is crucial that consumer needs and expectations are understood so that it becomes possible to provide public transport services that consumers perceive to be viable alternatives to the private car.

According to McKnight et al.(1986) the quality of transport services are influenced by five main elements, namely: reliability, extent of service, comfort, safety and affordability (RECSA). According to Heyns and Luke (2016), the results of the past annual State of Transport Opinion Polls indicate that, according to the respondents, commuter transport is not yet safe, reliable, effective or affordable. Given these findings it would be preferable to adapt the SERVQUAL instrument to include more suitable dimensions and items that addresses the specific service quality concerns of the users.

Randheer, et al. (2011) state that traditional SERVQUAL dimensions may not always be appropriate to all situations and contexts. For this reason, they added culture to their study of customer expectations in public transport. Vilakazi and Govender (2014) applied the

RECSA dimensions in an exploratory study to determine service quality perceptions of public transport users in South Africa. Khuong & Dai (2016) found this to be appropriate for measuring taxi services in Vietnam as did Horsu & Yeboah (2015) in Ghana. RECSA is considered fitting for measuring service quality in public transport in South Africa as, in a developing world context, affordability is considered a key component of the service levels offered to customers.

3 RESEARCH METHODOLOGY

The objective of this paper is to measure and understand the gap that exist between commuters' expectations of service quality and the actual service quality offered by selected public bus services in the Greater Johannesburg area. A modified SERVQUAL approach, using the RECSA dimensions was used to determine service quality and customer satisfaction of selected public bus services.

The research instrument was developed by generating 25 items, evenly distributed between the five dimensions, after a thorough consideration of the service quality elements of public transport services. The structured interviewer-administered questionnaires consisted of three sections. The first section requested information on characteristics such as age, gender, employment status and frequency of usage; the second section measured the respondents' expectations regarding service quality of the transport service, and the third section examined the respondents' perception of service quality actually provided by the specific transport service. Similarly to the majority of SERVQUAL applications, a five point Likert-type scale, anchored by strongly disagree (1) and strongly agree (5), was used to score the respondents' level of agreement with the item statements. The survey was conducted amongst the waiting commuters of the major two bus service providers at bus stops near the researchers' premises in the Johannesburg area. Convenience sampling, conducted by trained research assistants, was thus for used to obtain 300 and 100 responses from Metrobus and Public Utility Transport Corporation (PUTCO) commuters respectively. Because convenience sampling was used, generalisation from the results of this research is undermined (Zikmund, et al., 2013).

4 RESEARCH RESULTS

The questionnaire data was analysed using SPSS for Windows version 23. The reliability of the measurement scale was gauged to ascertain the internal consistency. Internal consistency was evaluated for both the perception and the expectation items for Metrobus and PUTCO. For the Metrobus data, the overall Cronbach's α values was 0.905 and 0.961 for the perception and expectation respectively, which indicates that the two questionnaire segments are very reliable (Field, 2013) For the PUTCO data, the overall Cronbach's α values was 0.894 and 0.991 for the perception and expectation respectively, which also indicate a reliable level of internal consistency. Also refer to Table 4 and Table

5, which indicate that the Cronbach's α values for the different dimensions are acceptable (Pallant, 2016). The profiles of the two response groups is shown in Table 2 and Table 3 below.

Table 2 Profile of respondents (Metrobus)

Characteristics		Percentage of respondents
Gender	Male	41%
	Female	59%
Age	Below 20 years	31%
	21 - 30 years	42%
	31 - 40 years	15%
	41 - 50 years	7%
	51-60 years	2%
	Above 60 years	3%
Occupation	Scholar/student	59%
	Full time employed	33%
	Part time employed	5%
	Unemployed	1%
	Retired	2%
Frequency of travel	1-2 times per day	43%
	3-4 times per week	40%
	1-2 times per week	6%
	1-2 times per month	3%
	Seldom	8%

Table 3 Profile of respondents (PUTCO)

Characteristics		Percentage of respondents
Gender	Male	41%
	Female	59%
Age	Below 20 years	4%
	21 - 30 years	55%
	31 - 40 years	28%
	41 - 50 years	7%
	51-60 years	4%
	Above 60 years	2%
Occupation	Scholar/student	13%
	Full time employed	82%
	Part time employed	4%
	Unemployed	1%
Frequency of travel	1-2 times per day	60%
	3-4 times per week	35%
	1-2 times per week	1%
	1-2 times per month	4%

By rating the 25 items on a five-point scale according to their perceived and expected service quality levels, a SERVQUAL gap score can be determined by subtracting the expectations (E) score from the perceptions (P) score. Three results can be observed:

- If $P-E > 0$, a more than satisfactory level of service quality is perceived
- If $P-E = 0$, a satisfactory level of service quality is perceived
- If $P-E < 0$, a less than satisfactory level of service quality is perceived

The SERVQUAL gap scores at dimension level is illustrated in Table 4 and Table 5 and highlights the negative gaps between perceptions and expectations. For the Metrobus service the biggest gap refers to the ability to provide a precise and dependable bus service, with the reliability dimension getting a gap score of -1.243. For the PUTCO service the biggest gap also relates to the reliability dimension which attained a gap score of -1.756, followed closely by the comfort dimension with a gap score of -1.702.

Table 4 SERVQUAL gap scores at dimension level (Metrobus)

SERVQUAL dimensions	Expectation (E)		Perceptions (P)		Gap (P-E)
	Cronbach's α	Mean	Cronbach's α	Mean	
Reliability	0.70	4.07	0.89	2.83	-1.24
Comfort	0.79	4.17	0.90	3.21	-0.96
Extent of Service	0.78	4.24	0.86	3.15	-1.09
Safety	0.83	4.35	0.89	3.31	-1.05
Affordability	0.85	4.21	0.91	3.40	-0.81
Total SERVQUAL	0.96	4.21	0.91	3.18	-1.03

Table 5 SERVQUAL gap scores at dimension level (PUTCO)

SERVQUAL dimensions	Expectation (E)		Perceptions (P)		Gap (P-E)
	Cronbach's α	Mean	Cronbach's α	Mean	
Reliability	0.76	3.83	0.96	2.07	-1.76
Comfort	0.74	3.77	0.97	2.06	-1.70
Extent of Service	0.75	3.78	0.97	2.43	-1.35
Safety	0.78	3.85	0.96	2.78	-1.07
Affordability	0.90	3.94	0.97	3.35	-0.59
Total SERVQUAL	0.99	3.83	0.89	2.54	-1.29

The overall average score for Metrobus commuters' perceived level of service quality is 3.18 out of a possible score of 5. Their expectations of bus service quality is an average score of 4.21 which indicates an overall bus service that is perceived to be less than satisfactory. The overall average score for PUTCO commuters' perceived level of service quality is 2.54, while the expectation score is 3.83 which also indicates a less than satisfactory bus service. As depicted in Figure 3, the expected service quality levels from PUTCO commuters are noticeably lower than the Metrobus commuters for all dimensions. The Pearson chi-squared test statistic was used and in all cases the probability was less than the α significance level of 0.05. The null hypothesis that differences in 'expectation of (service attribute)' are independent of differences in 'company' is thus rejected. The research hypothesis that differences in 'expectation of (service attribute)' are related to differences in 'company' is supported in this analysis. This could possibly be attributed to the perception that PUTCO is a service aimed at lower income users, whereas Metrobus is considered to be a service aimed at the general commuting public.

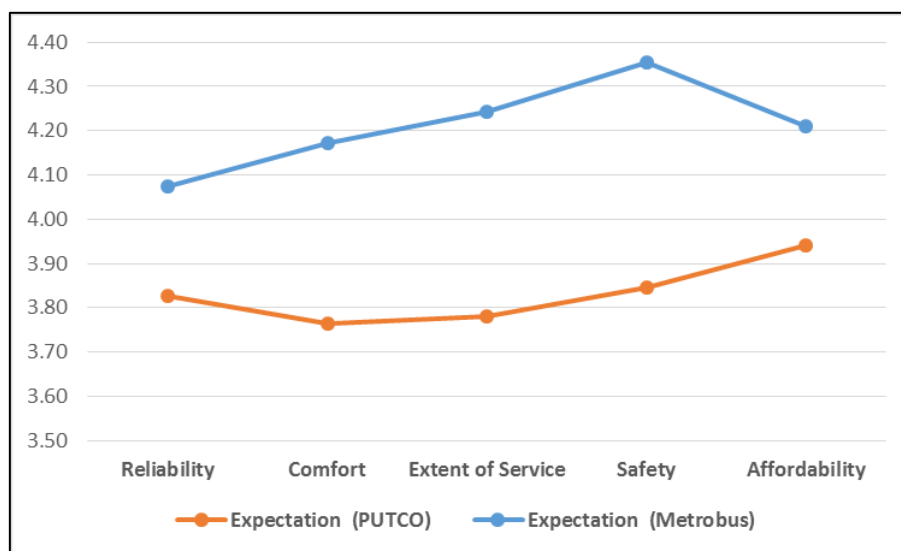


Figure 3 Expected service levels

As depicted in Figure 4, the perceived service quality levels from Metrobus commuters are visibly higher than the PUTCO commuters for all dimensions. The Pearson chi-squared test statistic was used and in most cases the probability was less than the α significance level of 0.05. The null hypothesis that differences in 'perception of (service attribute)' are independent of differences in 'company' is thus rejected in most cases. The research hypothesis that differences in 'perception of (service attribute)' are related to differences in

'company' is supported in most cases this analysis. The exceptions are bus service availability on weekends / public holidays are adequate; there are adequate safety measures against crime on buses; there are adequate safety measures against crime at waiting areas and fare increases are reasonable. This possibly indicates that users of the two services do not perceive significant differences between these attributes on the two services.

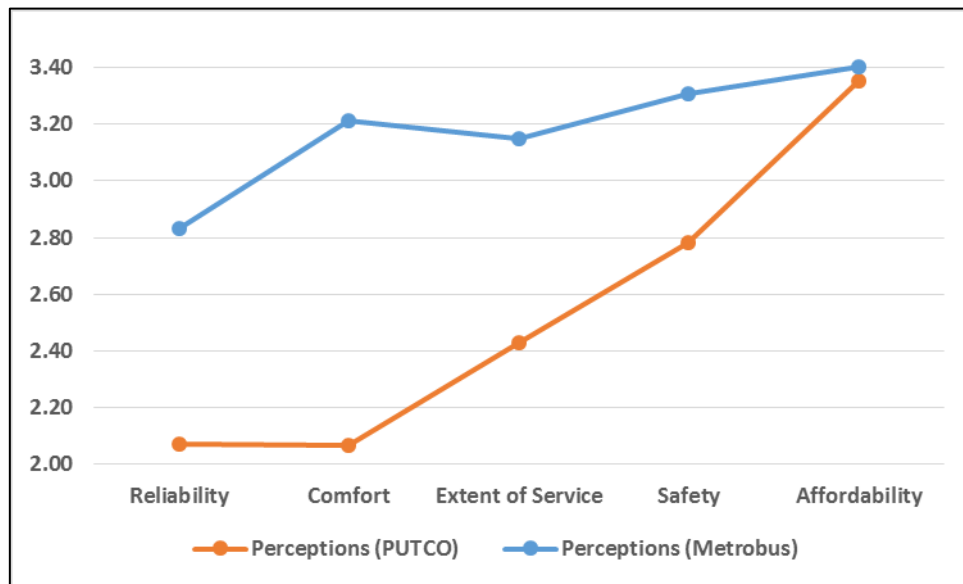


Figure 4 Perceived service levels

Table 6 provides the detailed scores within the different dimensions of bus service quality for Metrobus and PUTCO and highlights the areas of inadequacy and agreement. Paired t-tests indicated statistically significant differences between the expectations and perceptions ($p < 0.05$) for all service attributes for both bus services.

The key service shortcomings for Metrobus are the lack of adequate safety measures against crime; insufficient notification of the availability of services; the protection provided at the waiting areas; inadequate operational times after hours and during weekends and holidays and punctuality and adherence to bus schedules.

Metrobus commuters indicated that the best areas of service quality provided are the availability of weekly/season tickets, feeling safe and comfortable in the vehicle, and the availability of bus schedule information.

The key service limitations identified by PUTCO commuters are lack of protection provided at the waiting areas, punctuality and adherence to bus schedules; overall condition and neatness of buses and related infrastructure; breakdowns of buses and the insufficient notification of the availability of services.

PUTCO commuters indicated that the best areas of service quality provided are the affordability of the service, specifically the cost and price increases and the availability of weekly/season tickets and feeling safe in the vehicle, in terms of there being low probabilities of accidents and driver training being adequate.

Table 6 Metrobus and PUTCO service quality scores

SERVQUAL attributes	Metrobus					PUTCO				
	Expectation (E)	Perceptions (P)	Service Gap (P-E)	Paired T-test		Expectation (E)	Perceptions (P)	Service Gap (P-E)	Paired T-test	
				t-value	p-value				t-value	p-value
Reliability										
Buses always arrive at the destination on-time	3.97	2.63	-1.31	-13.53	<0.001	3.73	1.84	-1.88	-10.97	<0.001
Buses never break down on the road	4.05	2.94	-1.07	-11.25	<0.001	3.77	1.89	-1.87	-9.40	<0.001
There are bus timetables and other user information	4.21	3.38	-0.83	-9.05	<0.001	3.87	2.28	-1.58	-9.17	<0.001
Bus companies always inform people of availability of services	4.07	2.41	-1.68	-17.92	<0.001	3.88	2.06	-1.81	-9.81	<0.001
Staff are always willing to help passengers	4.15	2.83	-1.26	-13.85	<0.001	3.89	2.29	-1.57	-7.84	<0.001
Comfort										
Buses are clean and well maintained	4.33	3.62	-0.72	-9.35	<0.001	3.80	1.91	-1.89	-9.95	<0.001
Buses have ample legroom and foot space	4.26	3.42	-0.88	-10.46	<0.001	3.76	2.32	-1.42	-7.84	<0.001
A smooth ride is enjoyed for the journey	4.24	3.52	-0.70	-8.60	<0.001	3.79	2.49	-1.28	-7.22	<0.001
Waiting areas are sheltered	4.11	2.65	-1.48	-14.67	<0.001	3.75	1.77	-1.97	-10.18	<0.001
Waiting areas are clean and well maintained	4.00	2.80	-1.23	-12.72	<0.001	3.74	1.83	-1.91	-9.33	<0.001
Extent of Service										
Bus services on weekdays is adequate	4.25	3.26	-1.00	-11.44	<0.001	3.80	2.37	-1.41	-7.40	<0.001
Bus service availability on weekends / public holidays is adequate	4.12	2.69	-1.43	-15.12	<0.001	3.69	2.43	-1.26	-7.67	<0.001
Bus services in the evenings is adequate	4.32	2.95	-1.40	-15.39	<0.001	3.77	2.26	-1.52	-8.75	<0.001
Buses are available to most areas in the city	4.32	3.44	-0.85	-10.03	<0.001	3.82	2.48	-1.35	-7.77	<0.001
Bus stops are conveniently located	4.29	3.36	-0.95	-11.23	<0.001	3.83	2.60	-1.23	-6.53	<0.001
Safety										
There is a low probability of accidents	4.42	3.81	-0.60	-7.24	<0.001	3.83	2.99	-0.83	-5.38	<0.001
Drivers are well trained and safety measures are used	4.46	3.58	-0.86	-9.85	<0.001	3.90	2.99	-0.90	-5.70	<0.001
There is a low possibility of personal injury due to reckless driving	4.40	3.53	-0.84	-8.91	<0.001	3.89	2.85	-1.03	-6.68	<0.001
There are adequate safety measures against crime on buses	4.34	3.19	-1.16	-13.06	<0.001	3.83	2.89	-0.93	-6.43	<0.001
There are adequate safety measures against crime at waiting areas	4.20	2.45	-1.76	-17.75	<0.001	3.79	2.18	-1.61	-9.71	<0.001
Affordability										
Fares are affordable	4.22	3.31	-0.94	-11.59	<0.001	4.02	3.42	-0.60	-5.00	<0.001
Fares are good value for money	4.25	3.33	-0.96	-12.04	<0.001	3.93	3.06	-0.85	-5.78	<0.001
I can buy weekly / monthly / season tickets	4.34	4.01	-0.36	-4.85	<0.001	3.96	3.48	-0.50	-4.17	<0.001
Fares are cheaper than other transport modes	4.16	3.23	-0.94	-10.60	<0.001	3.90	3.54	-0.35	-2.94	<0.001
Fare increases are reasonable	4.13	3.18	-1.00	-11.34	<0.001	3.90	3.26	-0.65	-4.45	<0.001

5 CONCLUSION

This study has presented the findings of a survey that examined the gap between the expectations and the perceptions of selected public transport users in the Johannesburg area. The study demonstrates the application of a modified SERVQUAL instrument for the measuring of transport service quality of two public bus operators, namely Metrobus and PUTCO.

The established SERVQUAL which commonly uses the RATER (reliability, assurance, tangibility, empathy, responsiveness) dimensions was modified to include the RECSA (Reliability, extent of service, comfort, safety and affordability) dimensions with 25 items distributed evenly amongst the different dimensions.

The overall perception scores across both operators were less than the expected scores, which indicates a less than satisfactory service quality. In particular, the areas where Metrobus fell short were in the reliability and safety dimensions. These related to the unsatisfactory safety measures against crime and inadequate notification of the availability of services. For the PUTCO commuters, the service quality was lacking in the reliability and comfort dimensions. These related to the dependability, punctuality and consistency of bus services and the overall condition and tidiness of buses.

It is worth noting that PUTCO commuters have much lower expectations of service quality than do Metrobus users. This is possibly attributable to the perception that PUTCO is aimed at low income earners. Despite these low expectations, perceptions of the service are still not being met. The results indicate that, aside from the affordability dimension, the gap between the mean ratings for all other dimensions are considerably higher for PUTCO than for Metrobus. This indicates that although more is expected from Metrobus services, the company is closer to meeting service level expectations than PUTCO. Even though expectations are moderate for PUTCO, they are not close to being met. The high gaps between perceptions and expectations of bus services, particularly for largely captive users, provides a good indication of the growing car ownership and congestion levels in the city.

To the best of our knowledge, this is the only research that provides empirical evidence of service quality perceptions and expectations of public transport, specifically buses, in the City of Johannesburg. This research is of value to the two transport service providers in understanding the gaps in their service provision. It is also of value to policy makers in understanding the dissatisfaction in the current levels of public transport service, as well as providing some indication of the areas in which future interventions can be directed.

Notwithstanding several interesting results, this research is some limitations, mainly referring to the size of the samples, the inherent weaknesses in the SERVQUAL methodology and the limited geographic area investigated. Future research could extend the current study to include a wider geographical coverage, enabling generalisation to the population.

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