

MEASUREMENT OF SERVICE QUALITY OF “TROTRO” AS PUBLIC TRANSPORTATION IN GHANA: A CASE STUDY OF THE CITY OF KUMASI

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ABSTRACT

An efficient urban transportation system is essential for providing adequate mobility to satisfy various socio-economic needs. In developed countries, the majority of public transportation is usually provided by the state. Contrary, in developing countries, public transportation services .mostly provided by privately-owned operators resulting in greater diversity in service provision. These private transport operators often provide services on a large part of the transport system under highly competitive but poorly regulated conditions.

The trend of relying on the private sector to provide public transport services has resulted in a large number of individual operators focuses more on maximize profit instead of safety and quality of service. Their operations are characterized by no time schedules, delays, longer turn-around time as well as unilateral decision. The number and frequency of service on any given route can change daily thereby undermining the quality of service provided to the public. This paper assesses customers' satisfaction of the services provided by the minibuses (“trotro”) in the City of Kumasi, Ghana regarding the expected and perceived quality of service. The service quality (SERVQUAL) model was used to analyze results of the study.

It was found from statistical analyses that there are gaps between passengers and operators perception in terms of quality of service provided by the ‘trotro’ as public transport. Based on this finding, it is recommended that the trotro industry should therefore implement programmes aimed at improving customer satisfaction. The improvement must target better security services at the terminals through lighting and provision of personnel for 24 hours and information through the use of public address system and maps. Additionally, cleanliness must be improved upon both at the stations and inside the buses and the grounds should be paved and sanitation taken up by efficient cleaning service operators.

1. INTRODUCTION

An efficient urban transportation system is essential for providing adequate mobility to various socio-economic activity locations to satisfy human needs, a stimulus to economic growth and poverty reduction (Algadhi SAH, 1992). An efficient transportation system therefore has a significant impact on the quality of life, opportunity for citizens and businesses.

In developed countries, the majority of public transportation is usually provided by the state, where both capital and operating costs are subsidized by the state. The operations of public

transport are associated with time schedules which are planned in a coordinated manner to serve diverse routes and hours of operation (Linder Too and George Earl, 2009). Thus the number and frequency of service on any given route has been planned and is fixed on daily basis.

In developing countries, public transportation services are however provided by a number of individual privately-owned operators resulting in greater diversity in service provision. These operators often provide services in a large part of the transport system under highly competitive but poorly regulated conditions. Governments though provide a small percentage of the transport services, for example, through metro mass transport or State Transport Corporations.

Again, most governments of developing countries face the difficulty in promoting and sustaining affordable public transport for their citizens due to poor management, financial constraints and poor attitude toward state owned ventures. With the aim of sustaining long term relationships with their customer, many businesses including the transport sector have changed their strategic focus to emphasize customer retention (Peng & Wang, 2006)

The trend of relying on the private sector for the provision of public transport services has resulted in a large number of individual operators whose main aim is to maximize profit at the expense of safety and quality of service. Their operations are mostly characterized by no time schedules, delays, longer turn-around time as well as unilateral decisions by the operators. The number and frequency of service on any given route can change significantly from one day to the next thereby undermining the quality of service demanded by the public.

In Ghana, the operations of the minibuses (“trotro”) as modes of public transport have been in existence for decades. The “trotro” is a minibus with a capacity of 12 or 15 persons. The main patrons (users) of ‘trotros’ have been passengers with different backgrounds, ranging from lower to middle income classes such as public service employees, market women, housewives, school children and the like. The public transport operators must perceive the needs and expectation of their passengers and customers as crucial. Managing their expectations and perceptions has become increasingly important as the transport operators not only want to find out what their customers think, they also want to identify deficiencies in the services so that they can plan and implement new measures as these result in customer satisfaction and affect their loyalty and business sustainability.

This paper assesses costumers’ satisfaction of the services provided by the trotro in the city of Kumasi in terms of expected and perceived service quality. The study also examines other characteristics of the minibus as a mode of public transport. Fig 1 shows a typical trotro vehicle in use as public transport mode in Kumasi, Ghana.



Fig 1: Typical trotro as public transport mode in the city of Kumasi

2. METHODOLOGY

The service quality (SERVQUAL) model developed by Parasuraman et al., (1985) was used. The SERVQUAL method measures customer expectation and perception (observed) of the service delivered. The approach is based on the assumption that the level of service quality experienced by a customer is critically determined through a gap analysis between customers' expectations for excellence and their perceptions of actual service delivered according to Parasuraman et al. (1988). The gap is defined as the difference between the score of perceived and expected service quality. A suitable index referring to the ratio between perceived and expected quality was calculated and was used as basis for suitable improvement or otherwise.

The evaluation of the service quality of the "trotro" operations considered five quality dimensions and ten attributes that have been ranked by customers and operators to be most important or satisfactory, namely; tangibles, reliability, responsiveness, assurance and empathy (Beirao G & Sarsfield Cabral J A, 2007). The tangibles are associated with the appearance of physical facilities, equipment, personnel and communication materials. The ability to perform the promised service dependably and accurately is termed the reliability dimension. The responsiveness dimension refers to the willingness to help customers by providing prompt service. The dimension assurance refers to the knowledge and courtesy of employees and their ability to inspire trust and confidence. Finally empathy defines the individualized attention the enterprise provides to its customers.

Ten service attributes considered were:

- Reliability – Schedule adherence, bus arrives on time, late or early.
- Frequency – The number of bus trips per day.
- Capacity – The allowable number of persons in the transport mode.
- Price – Suitability of fare structure to the mode being used.
- Cleanliness – Clean stations, exterior and interior of the bus.

- Comfort – Shelter and lighting at stations and condition of seats in the bus.
- Security – Overall security from criminal incidents by day and night.
- Information – Availability of timetable, maps, announcement of delays, etc.
- Attitude of service personnel – Crew attitude to serving the customers.
- Physical condition of the Bus – Is the bus new or old.

A questionnaire was used to solicit information on the expected and perceived transport quality services from the passengers and operators of trotro users in the city Kumasi, Ghana.

Total samples of 484 questionnaires were administered to 84 trotro operators and 400 passengers, of which 194 were women and 288 men (Glenn D Israel, 1992). A likert scale with the value of 1 to 5 was used to measure both the expected and perceived service quality where 1 was very dissatisfied and 5 very satisfied. 16 trotro stations were visited between 7am and 9am from Monday to Friday and their locations are as showed in fig 2.

A stratified random sampling technique was adopted for the data collection. Respondents of age 15 years and above were interviewed. Data were also collected on travel distance and purpose of trotro usage. Statistical analysis was carried out using chi-square test to assess the quality of service base on 5% level of significance. Rating the attributes according to their perceived and expected service quality levels, a SERVQUAL service gap score is obtained by subtracting the expectation score from perception score:

$(P - E)$. There are then three possible outcomes:

Where $P - E > 0$, this implies more than satisfactory level of service quality

Where $P - E = 0$, this implies satisfactory level of service quality

Where $P - E < 0$, this implies less than satisfactory level of service quality

In addition, analysis of variance (chi square) statistical technique was used to test for significant differences in the mean scores from each of the attributes. The data are tested based on a 0.05 significance level. This provides 95% confidence level in the conclusion we make regarding differences in attitudes among the attributes. Where the significance level is less than 0.05, we reject our null hypothesis that the means of the groups are equal. This implies that there is a significant difference in the attitudes toward trotro as public transport service level among the commuters. A significance level score greater than 0.05 means that statistically no significant difference in attitude exists among the perceived and expected opinions.

2.1 The Study Area

The city of Kumasi, the study area, has a population of about 1.5 million inhabitants with an annual population growth rate of 5.5%. It is the second largest city in Ghana and functions as an important marketing and commercial centre linking the Northern and Southern Sectors of Ghana with a good road network (Ghana Statistical Service, 2002).

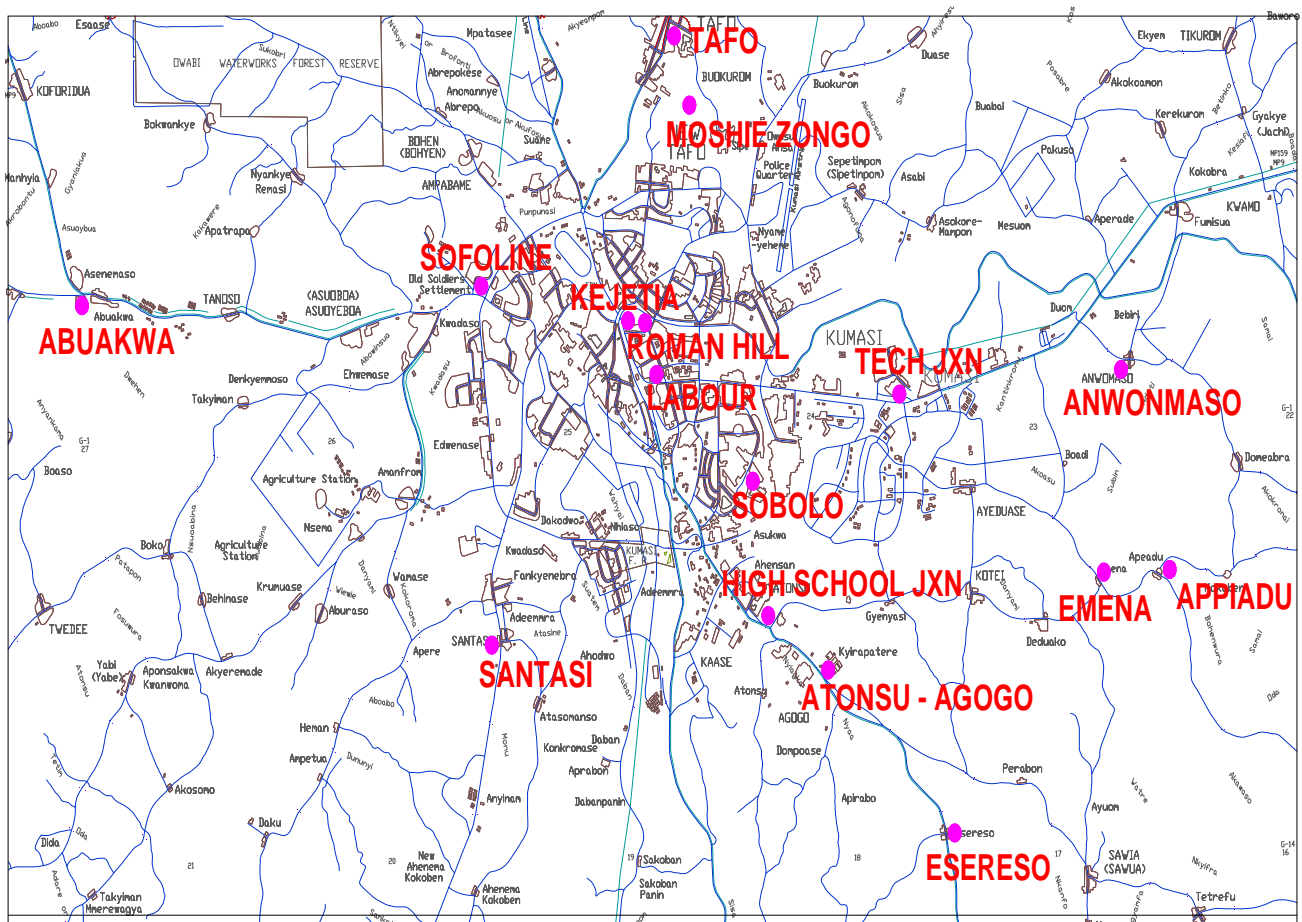


Fig 2: Map of Kumasi showing the troto stations where the surveys were conducted. Red Dots represents the stations.

3. RESULTS AND DISCUSSIONS

Figure 3 shows that out of the 400 passengers interviewed, 43% of them used the troto as means of transport to travel to work and, 17% to school, respectively. In addition, 40% travel by troto for other social activities such as family visits, shopping, hospitals and funeral. The average distance travelled by the “Trotros ” in the Metropolis is 7.2 km, which is about two times the average distance (3.0km) school children walk to school (Afukaar and Agyemang, 2006).

Table 1 show results of the gap analysis from the survey using chi-square test are shown in Table 1. The table presents the average ratings of service rendered and gaps, which represent the quality of service measurement by both operators and passengers. From the table, over 80% of the operators responded positively on the reliability of the troto as a means of transport as against 75% of the passengers giving a gap of -0.45. This may be attributed to the fact that the operations ‘troto’ is not guided by regular time schedule which is crucial to commuters who patronize the services and as such cannot rely on the services for planning purpose, which generate long queues especially during the rush hours. This is because the ‘troto’ operation from the terminals is guided by full passenger loads before departure, thereby undermining any regular time scheduling. There are also no dedicated ‘troto’ stops where passengers’ can stop and wait for the boarding of the ‘ trotros’. This results support the empirical findings of O’Hara, (1999), Edvardsson, (1998), and Linda Too et al., (2009), that reliability is a key ingredient which influences passengers’ choice for transport service.

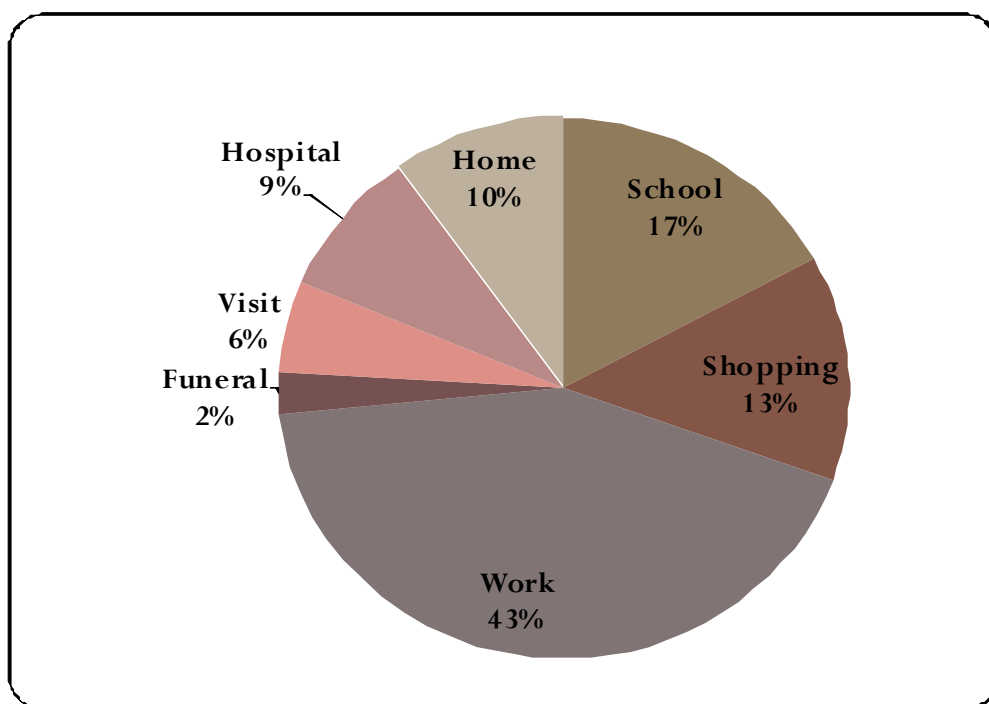


Fig 3: Purpose of Journey by Trotro as a Mode of Transport

Table 1: Average Rating of Service Rendered and Gaps

Service Attributes	Y*	X**	Gap (X-Y)	Suitability Index (%)	χ^2	P value
Reliability	4.4	3.95	-0.45	89.77	28.4	<0.001
Frequency	3.1	3.29	0.19	106.12	26.2	<0.001
Capacity	3.94	4.24	0.30	107.63	29.3	<0.001
Price	3.04	3.92	0.88	128.95	64.2	<0.001
Cleanliness	3.49	2.61	-0.88	74.48	63.0	<0.001
Comfort	3.6	3.88	0.28	107.78	15.4	<0.01
Security	4.45	3.51	-0.94	78.88	52.5	<0.001
Information Flow	2.79	2.7	-0.09	96.88	10.6	0.032
Attitude of personnel	3.68	3.12	-0.56	84.89	32.1	<0.001
Bus condition	3.83	3.35	-0.48	87.5	20.2	<0.001
Average	3.63	3.46	-0.17	96.29		

Y * and X ** Indicate the average rated opinion of services perceived by operators and expected by passengers

Also, as shown in the table, the average rated opinion on frequency as an attribute to service quality was 3.1 for operators and that of passengers was 3.29 giving a gap of 0.19. The observed difference in the rate of frequency was statistically significant ($\chi^2 = 26.6, p < 0.001$) with a suitability index of 106.12%. Thus, the provided service quality relating to frequency exceeds passengers' expectations. This means that the service frequency provided by operators is more than what passengers expect.

Similarly, the average rated opinion on capacity as an attribute to service quality was 3.94 for operator as against that of passengers which was 4.24 resulting in a gap of 0.30. The

observed difference in the average rating of capacity was statistically significant ($\chi^2 = 29.3, p < 0.001$) with a suitability index of 107.63%. Thus, the provided service quality relating to capacity is greater than passengers' expectations. The results indicate that passengers were satisfied with the sitting capacity in the trotro. This shows that the trotro operators do not overcrowd passengers in the vehicle.

Whereas the average rated opinion on pricing as an attribute to service quality was 3.04 for operator and 3.92 for passengers resulting in a gap of 0.19, the observed difference in the average rating of pricing was statistically significant. This means the prices charged by trotro operators seem to be moderate to the passengers which has come about as a result of the policy of regulating prices by the government of Ghana. This result is in agreement the findings of Shiftan and Sharaby (2012) that optimal fare structure will not only help to maintain customers but will also improve public transport attractiveness. Generally, the 'trotro' service fare is quite low thereby making it attractive and a first option for most passengers in Ghana.

Also, the average rated opinion on cleanliness as an attribute to service quality was 3.49 for operator, with that of passengers being 3.92 giving a gap of -0.88. These results show that the service level relating to cleanliness is lower than what passengers were expecting. This may be due to the fact that the trotro kept working throughout the day and no special attention is paid to their cleanliness until after close of day. There is the need to improve the level of cleanliness in trotro operations to make them more attractive. This result confirms the findings of Chen and Lai, (2011) that cleanliness significantly influences passengers' behavior intention.

With respect to comfortability, the average rated opinion on comfort as an attribute to service quality was 3.6 for operator and that of passengers was 3.88 giving a gap of 0.28 meaning passengers were satisfied with the service provided by the operators. Thus the level of comfort provided by trotro operators meet the expectations of passengers. These results coincide with the results for trotro capacity and are also consistent with the findings of dell'Olio et al., (2011) that public transport users value comfortability and capacity adherence when assessing service quality

Whereas the average rated opinion on security as an attribute to service quality was 4.45 for operators and that of passengers was 3.51 giving a gap of -0.94. The observed difference in the rate of frequency was statistically significant ($\chi^2 = 52.5, p < 0.001$) and the suitability index was 78.88%. Thus, the level of security provided by the trotro operators does not meet passenger's satisfaction level. The results indicate that the level of security provided by trotro operators at their terminals was low and needs necessary improvement. For example, public lighting system at the various terminals is poor leading to pick pocketing and muggings at night.

Information provision and promotional activities can take different forms. As shown in the table, the average rated opinion on Information flow as an attribute to service quality was generally not satisfactory, 2.79 for operator and that of passengers was 2.7 giving a gap of -0.09. The observed difference in the rate of frequency was statistically significant ($\chi^2 = 10.6, p = 0.032$) and the suitability index was 96.88%. However, good passenger information is an essential ingredient of a successful public transport system; but ill informed travelers may not be able to identify services which best suit their needs, leading to poor perceptions and low use of public transport.

Similarly, the average rated opinion on attitude of personnel as an attribute to service quality was 3.68 for operator and that of passengers was 3.12 giving a gap of -0.56. The observed difference in the rate of personnel attitude was statistically significant ($\chi^2 = 32.1, p < 0.001$) and the suitability index was 84.89%. The results indicate that the level of inter-personal relation of the operators is lower than what passengers expect. Since the service deals with human relation, passengers expect more from the operators.

A physical condition of bus as an attribute to service quality was rated as 3.83 for operators and that of passengers was 3.35 giving a gap of -0.48. The observed difference in the rate of frequency was statistically significant ($\chi^2 = 20.2, p < 0.001$) and the suitability index was 87.5%. The gap has come about because most passengers see the 'trotro' to be quite old and rickety. The minibuses are usually procured as second-hand goods vans which are later converted into passenger buses for 'trotro services. They are thus not strong.

From the analysis, the entire results clearly reveal that, with the exception of frequency, capacity, price and comfort, passengers' expectations regarding the level of service quality were not fully met. The measure of service superiority confirms that there are gaps in the range of between -0.09 (inflow of information) and -0.94 (Security at the stations) with the mean of -0.17. The survey findings suggest a gap between the community expectation of trotro in providing public transport service and the actual service quality provided. This was consistent across all commuter groups. In particular, the findings have been useful in shedding broad light on the areas where improvements are needed most that is responsiveness and reliability of service to encourage greater use of trotro within the community level. Based on the service dimensions, the widest gap was found for security (-0.94) while information flow has the narrowest gap with the value of (0.09). From the Table, trotro public transport service providers should take actions to improve their service quality to meet the passengers' expectations. Six out of the ten items associated with the service attributes show that service delivered are less satisfying from the point of view of passengers.

4. CONCLUSION AND RECOMMENDATIONS

The findings from this study confirm that there are gaps between passengers and operators perception on the quality of service provided by the 'trotro' as public transport. The mean difference indicates that the satisfaction level service quality for passengers was partially met. The suitability index provides valuable information about the performance level of the delivered service quality by trotro as a public transport and can be used as basis for further improvement on the following attributes; cleanliness, security and altitude of service personnel.

It is recommended that operators of the trotro industry should implement programs aimed at improving customer satisfaction which should target improving security at the terminals through lighting and provision of security personnel for 24 hours, information flow through the use of public address system and maps, cleanliness must be improved upon both at the stations and inside the buses, the grounds should be paved and sanitation taken up by efficient cleaning service operators.

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