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Commuters' Perceptions of Public Transport Service in South Africa

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Abstract
Considering that the study of public transport is important since it affects all citizens and is essential for the wellbeing of any nation, this paper reports the results of an exploratory study conducted in Johannesburg, South Africa among a convenience sample of 902 commuters selected using the commuter intercept survey. In contrast to traditional service quality research which uses the SERVQUAL instrument, this study used RECSA, which constituted the following transport service quality attributes: reliability, efficiency, comfort, safety and accessibility.

It became evident that with regard to public busses and mini-bus taxis, all RECSA service quality variables are important to commuters. In summary, min-bus taxis were perceived as being less comfortable and less safe and less reliable, yet their services were being used more than more frequently.

The findings have implications for service providers, transport planners and relevant government authorities, etc., in that they need to take cognizance of the perceptions of the commuters and implement strategies to improve the situation.

Keywords:
Public road transport; transport service quality; mini-bus taxi service

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Introduction

Public transport functions as a communal transporters on a large scale and is usually configured in such a way so as to provide scheduled services on fixed routes on a non-reservation basis. The majority of commuters travel in a local area between their homes and places of employment, shops or schools (UITP 2011). The benefits of a well-planned and efficiently managed transportation system spread far beyond the transport field, as it is essential for industry, for people's mobility and for good communication (Matthews 2013). There are 3.8 million people in Johannesburg, the majority aged between 19 and 39 (City of Johannesburg 2012). More specifically, with reference to Johannesburg Metropolitan Municipalities, the Metropolis has 800,000 daily commuters, 39.6% use minibus taxis, 27.1% use private cars, 24.1% use buses, and 9.2% use rail. Considering that a large number of people in South Africa and Johannesburg in particular, depend on public transport for their daily commuting, it is important to understand commuters' perceptions of public transport so that public transport organizations can provide a service that meets their needs. Service quality in the public transport sector has remained an elusive and a much neglected area of study. Data regarding the quality and performance indicators of public transportation services are vaguely determined and, in fact, are practically nonexistent (Simona 2010), and much of the debate has centred on the system itself: spatial designs, systems configurations, city network developments, government policies, and engineering services.

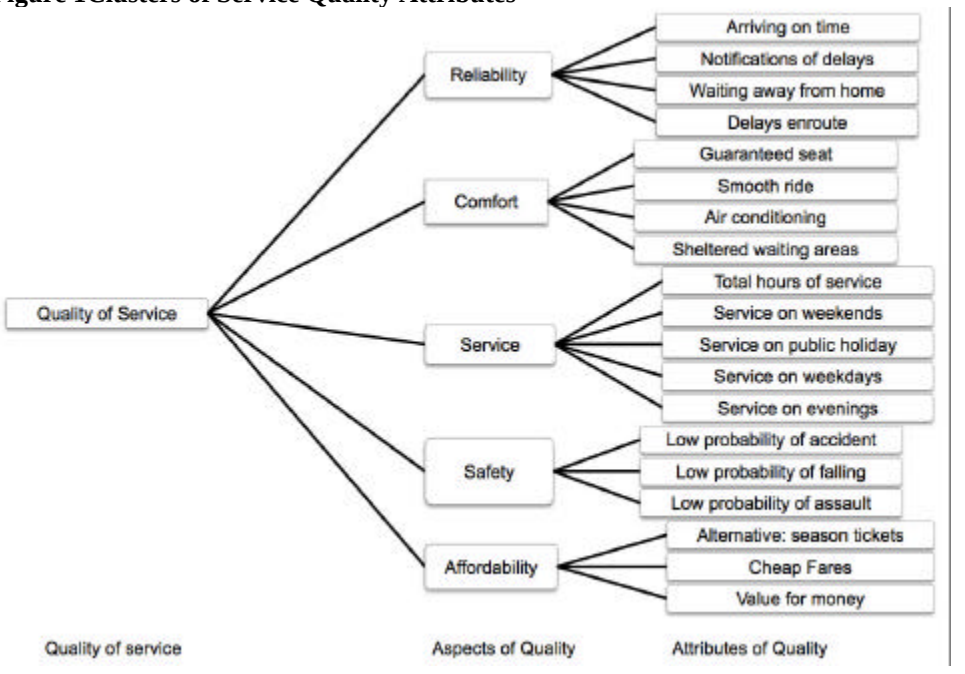
In view of the above, this paper reports on research conducted to explore commuters' perceptions of the bus and minibus taxi services in terms McKnight, Pagano & Paaswell's (1986) service quality dimensions namely, reliability, comfort, extent of service, safety; and affordability (RECSA).

Brief Literature Review

Service quality has remained a challenge for most public transport organizations partly because of the challenge in measuring service quality and partly because commuters do not perceive quality as a uni-dimensional concept – that is, customers' assessments of quality include perceptions of multiple dimensions that apply to all services. McKnight *et al*. (1986) state that 'one of the challenges confronting public transport organizations is that service quality in particular is a complex area of study and measuring service quality is made difficult by the subjective nature of service.' While instruments have been developed to assist organizations to measure service quality, there has been generally no agreement on the measurement of the concept. The majority of the work to date (Sahney, Pagano & Paaswell 2004) has attempted to use the SERVQUAL (Parasuraman, Zeithaml & Berry 1988).

According to McKnight *et al.* (1986) service quality dimensions should be viewed as the sum of general attributes which in turn are the sum of specific attributes grouped into clusters, as shown in figure 1.

Figure 1Clusters of Service Quality Attributes



Source: McKnight, C.E., Pagano, A.M. & Paaswell, R.E. (1986).

It is evident from figure 1 that the quality of transport services comprises five key elements, namely, is reliability, comfort, service, safety and affordability, commonly referred to by the acronym RECSA which is a modification of Parusraman et al.'s (1988) RATER. The various components of each of the RECSA variables provide information which is used in developing the questionnaires to determine commuters' perception of transport service quality.

This paper reports the findings of a study conducted to determine the commuters perception of service quality using the quality attributes depicted in figure 1.

Research Methodology

Area sampling, which is a probability cluster sampling procedure often referred to as the geographical sampling technique was used, by plotting bus and minibus taxi terminals on a geographical map and randomly selecting the bus and minibus taxi terminals to be included in the sample. A sample of 902 commuters was selected, based on the four reasons namely, costs, greater accuracy, speed of data collection, and availability of population elements. The following procedure was followed:

?A letter was sent to the City of Johannesburg, Transport and Planning Department requesting detailed maps of Johannesburg's bus and minibus taxi terminals, including maps showing the location of the minibus taxi ranks. An emergent challenge was that certain minibus taxi ranks were also being utilised as bus terminals and vice versa.

?Upon receipt, the maps were scrutinised for accuracy to ascertain whether they were correct, whether they highlighted all the bus and minibus taxi terminals in Johannesburg, and checked against the register of known bus and minibus taxi terminals from the City of

Johannesburg. This process validated the maps, which were then utilised in the sampling process.
?Geographical sampling was used in terms of which bus and minibus taxi terminals were grouped into homogeneous clusters. For example, terminals in townships formed a group, terminals in the suburban areas were grouped together, and terminals in the CBD were grouped together to ensure the homogeneity of the subjects in each cluster.

The respondents were intercepted at bus and minibus taxi terminals while waiting for their chosen mode of transport. The aforementioned strategy according to Forsyth *et al*. (1986) and McKnight *et al.* (1986) achieve a higher response rate than conventional postal surveys, although substantial differences between respondents in the quality of the responses may emerge according to the area in which the questionnaires were administered.

Measurement Instrument
The questionnaire was developed based primarily on previous research (McKnight, *et al*. 1986) and comprised the 37 items reflected in table 1.

Table 1 Public Transport Service Quality Measures

No	Variables	No	Variables
1	Punctuality of the service	21	Rate of accidents
2	Availability of timetables	22	Injuries due to accidents
3	Timely arrival at destinations	23	Condition of transport vehicles
4	Failure to be on time	24	Driving skills of drivers
5	Arrival at destinations	25	Drivers obeying rules of the road
6	Adherence to routes	26	Safety and future utilisation of the service
7	Reliability and possible future utilisation	27	Value for money service
8	Finding a seat	28	Fares
9	Smoothness of the service	29	Fares worth it
10	Availability of air conditioners	30	Fares are fair
11	Feelings about the lack of air conditioners	31	Fares are affordable
12	Condition of the shelters	32	Affordability and future utilisation of the service
13	Comfort and future utilisation of the service	33	Importance of reliability of the service
14	Exact location-destination	34	Importance of comfort
15	Availability of service on weekdays	35	Importance of the service
16	Availability of services on weekends	36	Importance of service
17	Availability of service on holidays	37	Importance of affordability of the service
18	Availability of service in the evenings		
19	Friendliness of drivers		
20	Availability of service for future utilisation		

Prior to conducting the research and gathering data on a large scale, it was essential to conduct an item analysis in order to test the construct validity of the measurement instrument (Aaker, Kumar & Day 2007). The objective of the pre-test was to remove errors, including questions which were too long, ill-defined, loaded or double-barrelled (Aaker, *et al.* 2007). A pilot group of 27 randomly selected commuters were interviewed in Johannesburg to pre-test the questionnaire. In addition, academics and other key stakeholders in public transport, inter-alia., the National Department of Transport, all provided views in relation to the objectives of this study. In addition, the two largest bus organisations in the country by turnover, number of buses, number of passengers carried, namely Johannesburg, Metrobus and PUTCO provided invaluable insight into public transport. Finally, the Top 6 Minibus Taxi Associations and South African Bus Owners Association also provided insight into the study.

From the pilot study it became evident that the questionnaire was reliable in that a reliability coefficient 0.80 was achieved, thus indicating a high level of reliability (Miller 2012). Content validity was also achieved in that the measure adequately covered the content area
(Miller 2012). There was a concern that the questionnaire might be too long. Initially, the interviewing process lasted approximately 20 minutes. However, the questions were reworded and shortened where possible. After this exercise, the interviewing process lasted approximately 15 minutes.

The data was collected through personal interviews as the greatest value of personal interviews with regard to passenger transportation studies, lies in the depth of information and the detail that may be secured. The information obtained in this way surpasses the information secured from telephone and self-administered studies (Cooper, *et al*. 2001).

Data Analysis

Although 902 questionnaires were administered, only 690 could be analysed, since a large proportion (212) of the questionnaires were excluded due to non-response to certain questions, a common challenge in public transport studies (McKnight, *et al.* 1986).

Cross tabulations were used for data analysis. Furthermore, because other aspects of the scales are interval, the arithmetic mean was used as a measure of central tendency. The summary statistics for each of the individual scales as well as for the Perception of Service Quality (PSQ) Index and Importance-Weighted Perception of the Service Quality Index were depicted by histograms for each of the individual scales was assessed.

Research Findings

Table 2 shows the utilisation of public transport by age and occupation status of the respondents.

Table 2 Employment Status and Mode of Public Transport Used

Occupation			Age					Total
			19	20-24	25-34	35-50	51+	
FT employed	used most often	Bus		4.7%	13.4%	10.3%	4.7%	33.2%
		Taxi	0.4%	9.9%	31.5%	15.9%	9.1%	66.8%
	Total		0.4%	14.7%	44.8%	26.3%	13.8%	100.0%
PT employed	used most often	Bus	1.0%	10.2%	11.2%	6.1%		28.6%
		Taxi	2.0%	24.5%	42.9%	2.0%		71.4%
	Total		3.1%	34.7%	54.1%	8.2%		100.0%
Student	used most often	Bus	10.8%	10.8%	1.0%	1.0%		23.5%
		Taxi	31.4%	33.3%	10.8%	1.0%		76.5%
	Total		42.2%	44.1%	11.8%	2.0%		100.0%
Scholar	used most often	Bus	36.6%					36.6%
		Taxi	62.2%	1.2%				63.4%
	Total		98.8%	1.2%				100.0%
self-employed	used most often	Bus		1.8%	7.1%	10.7%	1.8%	21.4%
		Taxi		10.7%	25.0%	33.9%	8.9%	78.6%
	Total			12.5%	32.1%	44.6%	10.7%	100.0%
unemployed	used most often	Bus		6.1%	3.0%	3.0%		12.1%
		Taxi		18.2%	27.3%	24.2%	18.2%	87.9%
	Total			24.2%	30.3%	27.3%	18.2%	100.0%
Other	used most often	Taxi			25.0%	25.0%	50.0%	100.0%
	Total				25.0%	25.0%	50.0%	100.0%
Total	used most often	Bus	10.4%	5.1%	7.0%	5.5%	1.7%	29.8%
		Taxi	19.9%	13.8%	21.8%	9.9%	4.9%	70.2%
	Total		30.3%	18.9%	28.7%	15.4%	6.7%	100.0%

It is evident from Table 2 that the majority (70.2%) of respondents indicated the minibus taxis as their 'most often' preferred mode of transportation. This confirms the contention of Ndebele (2011) and Thomas, Ryneveld, and Pascarel (2010) who assert that the minibus taxi industry transports around 70% of the country's public transport commuters.

Furthermore, this study also revealed that younger people tend to use public transport more often. The aforementioned researchers generally define young people as those members of the community who are between the ages of 18 and 35, who use public transport to reach school, places of work, sporting facilities and any other locations (UITP 2012). In terms of international transport use, young people represent almost half of the total number of people in transit and they tend to travel more than adults (UITP 2012).

Table 3 reveals that 46.7% of the public transport users earn between R0 and R1000, and irrespective of earnings, the majority use minibus taxis for commuting. This finding was expected, and also confirms the views of other researchers, such as Sohail (2005) who argued that access to sustainable and affordable public transport is critical for the urban poor, as it offers a way out of economic, social and physical isolation

Table 3: Income and Mode of Public Transport Used

	used most often		Total
	Bus	Taxi	
R0-R1000	13.4%	33.4%	46.7%
R1001-R2000	1.7%	7.5%	9.3%
R2001-R3000	3.6%	8.0%	11.6%
R3001-R4000	3.6%	7.4%	11.0%
R4001-R5000	2.2%	4.4%	6.5%

R5001-R6000	1.5%	1.9%	3.3%
above R6000	3.8%	7.7%	11.5%
TOTAL	29.8%	70.2%	100.0%

Commuters' Perceptions of Transport Service Quality

The questions on the perceptions of service quality of buses and minibus taxis were divided into five categories, each of which was used to form a measurement scale. Separate scales were developed for buses and minibus taxis, respectively. The five scales were Reliability (6 questions), Comfort (4 questions), Service (6 questions), Safety (5 questions) and Affordability (5 questions). The five scales were re-scaled so that each ranges from 0 to 10, with 0 being the worst possible perception and 10 being the best, and each was assessed individually for internal consistency using the Cronbach's alpha measure. As indicated in table 6, the values are all above 0.64, indicating an acceptable level of internal consistency for all the scales.

Table 6Internal Consistency of Scales

Scale	**Buses**	**Minibus Taxis**
Reliability	0.767	0.832
Comfort	0.712	0.650
Service	0.642	0.820
Safety	0.734	0.883
Affordability	0.789	0.837

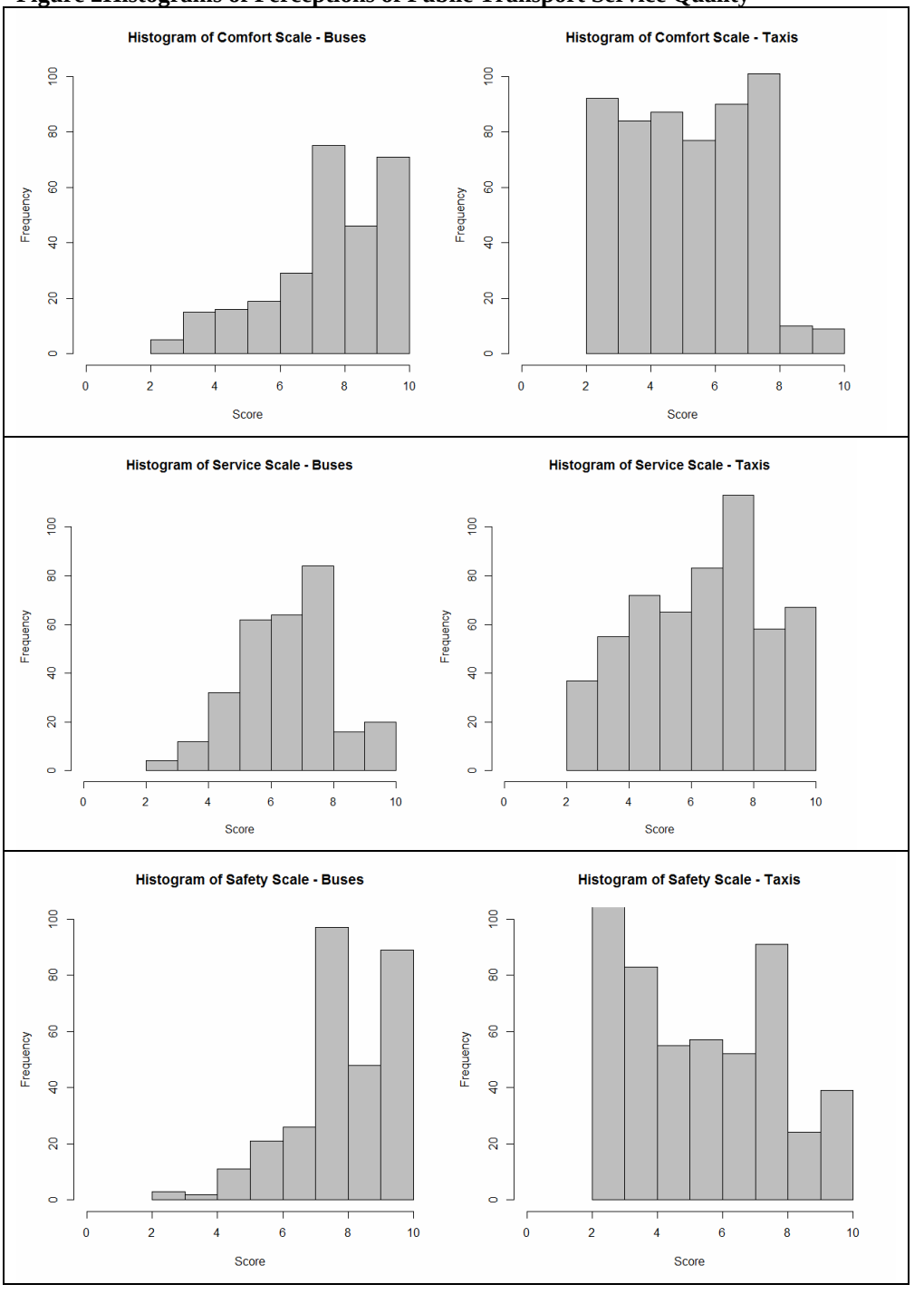
Table 7 presents summary statistics in respect of the importance attached to each of the five dimensions of quality of service, on a scale of 1 (less important) to 5 (very important). It is evident from table 4 that all five dimensions were considered very important, and equally so.

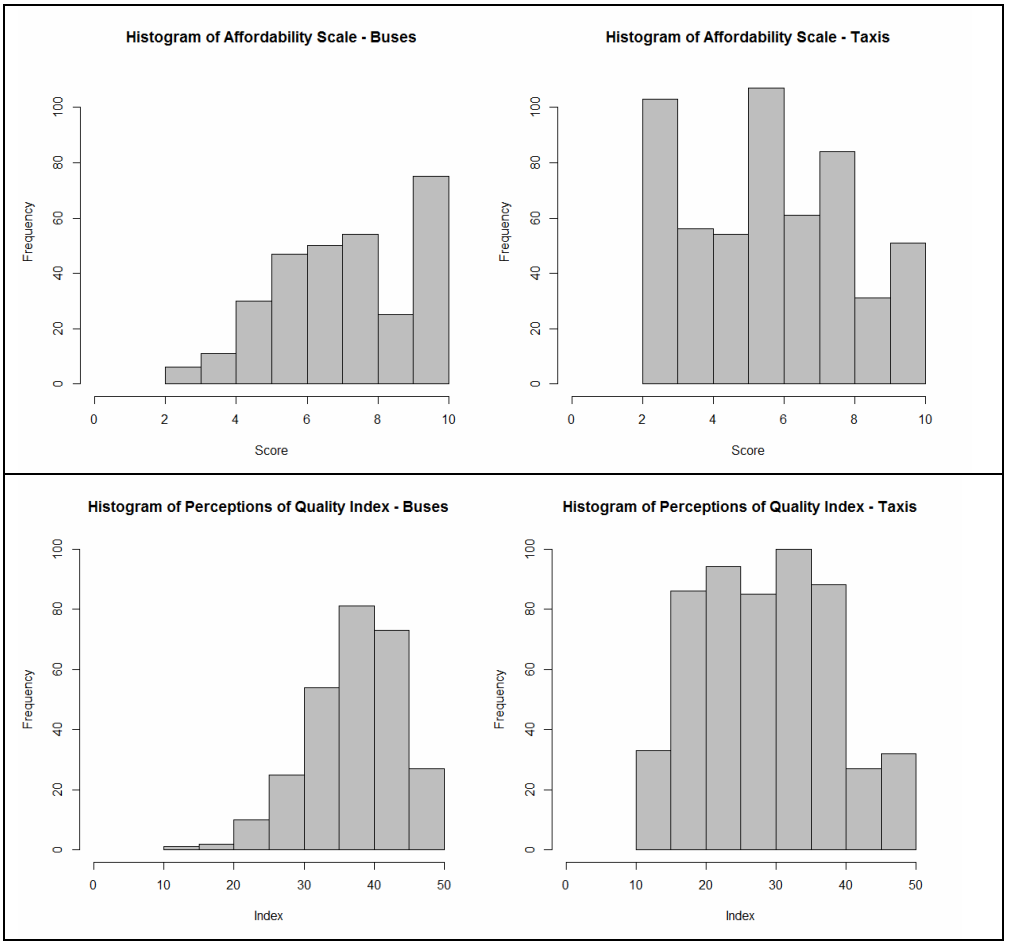
Table 7 Importance of Service Quality Dimensions

	Mean	Median
Reliability	4,4	5,0
Comfort	4,2	5,0
Service	4,3	5,0
Safety	4,3	5,0
Affordability	4,3	5,0

Figure 2 reflects the summary statistics of respondents' perception of public transport service quality in terms of the five service quality dimensions defined for this study displayed as histograms, as well as the summary statistics for the Perception of Service Quality (PSQ) Index and Importance-Weighted Perception of Service Quality Index.

Figure 2Histograms of Perceptions of Public Transport Service Quality





It is evident from figure 2 that buses were perceived as being more reliable than minibus taxis. This confirms what has been espoused in the literature, namely, that the bus industry is in a far better position than the minibus taxi industry to plan their operations effectively and this, in turn, impacts on the delivery of the service in terms of punctuality, availability of timetables, timely arrivals at destinations, and adherence to routes. On the other hand, in view of the informal nature of their operations, the planning and scheduling of routes of mini-bus taxis is not as structured and neither is it well co-ordinated through advanced planning systems. This invariably however tends to affect the scheduling process adversely and to limit a swift response to any service interruptions. Thus, as regards the minibus taxi industry there are no efficient, effective, planning systems in place to improve service and to take into account interruptions that may occur from time to time. Unlike bus transport, when service interruptions do occur, the industry is not accountable to anybody, and often not even to the passengers who may have had their trips delayed as a result of the service interruptions.

There is therefore a need for a more concerted effort on the part the public transport organisations, particularly the minibus taxi industry, to learn from countries which have implemented efficient scheduling and planning software systems, for example Dubai,

which introduced a state of the art bus scheduling and planning system, known as MICROBUS solutions (Shaibani 2005).

With regards to the service comfort, buses were perceived as being more comfortable than minibus taxis. Seat availability, being of one of the variables of service comfort should be displayed on public transport vehicles, on the electronic information boards at bus and minibus taxi ranks, and at bus stops. The load factor is which is the percentage of a vehicle's total capacity that is actually occupied (City of Johannesburg 2006) may play an important role in controlling the seat availability by ensuring that vehicles are not uncomfortably full. In line with international trends, such as the Bogotá TransMilenio system, and to avoid overcrowding and increase comfort the typical load factors are 80% for peak periods and 70% for non-peak periods is recommended (City of Johannesburg 2006).

With regard to the extent of service which involves taking passengers to their direct location, the availability of service during the day (peak and off-peak), in the evenings, over weekends, and on public holidays and, driver friendliness, there seems to be no difference in the perceived service level between buses and minibus taxis.

Regarding the safety of service, the study findings showed that buses were perceived to be safer than minibus taxis. The profiteering nature of the public transport industry, the minibus taxi service in particular, which often translates into overloading, conflict among minibus taxi associations, and a general failure on the part of the drivers to observe traffic rules contributes to lack of safety (Govender & Allopy. 2006: 106). It is therefore essential that traffic officials and other law enforcement agencies enforce traffic laws strictly and monitor compliance more effectively; while the public transport authorities should create an environment that makes non-adherence to traffic laws difficult. One of the most effective ways of controlling safety levels may be by self-regulation. For example, in Germany, the Traffic Safety Council promoted the establishment of voluntary safety circles where employees from the transport organisation met to discuss critical safety points and devise solutions (World Bank 2006).

As regards the affordability of service, the study findings showed that buses were perceived to be more affordable than minibus taxis.

Specifically with respect to the perceptions of service quality index some researchers (Budiono 2009; Simona 2010) support the aforementioned findings from similar studies where it was ascertained that safety and reliability were the important dimension of public transport services. Budiono (2009) established comfort of the service was one of the top four factors that positively correlated with overall satisfaction.

Conclusion

It became apparent that with regard to public busses and mini-bus taxis, all RECSA service quality variables are important to commuters. In summary, min-bus taxis were perceived as being less comfortable and less safe and less reliable, yet their services were being used more than more frequently. In order to realise a high degree of safety, especially among mini-bus taxis, it is essential that all three of the following areas work together smoothly and efficiently, namely, safety of passengers, safety of drivers, and

safety of vehicles. It is not possible for one individual to bring about improvements in safety – this is a collective responsibility and a collective spirit is required of all those involved.

In any society, people are entitled to mobility in the same way that they are entitled to sewage and fresh water systems. This means that passenger transport is a public utility; and the benefits derived from this public utility can only be realized if the system is planned and regulated so that all members of society benefit both the poor and the rich. It is important for all the role players, inter- alia, the state, service providers, the public, etc. to understand commuters' perceptions of public transport service. By conducting regular perception studies in order to ascertain what needs to be done to meet the needs of the commuting public, the quality of the service is likely to improve. Only through the perception studies and effective use of the results thereof, will it be possible to deliver a quality service that meets the needs of commuters.

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