

Assessment of Passenger Satisfaction with Semi-Luxury Bus Service: Panadura-Kandy (17) Route

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1. Introduction

Transport needs of people have been rapidly increasing over the past years due to rapid urbanization coupled with an increase in population. People tend to use private vehicles rather than public transport services due to expectations of efficiency, effectiveness, quality and convenience in fulfilling their day to day needs. This results in increased private motorization with a huge traffic congestion which results in longer travel times to reach the expected destinations and many other traffic related issues in urban cities. For instance, private motorization affects the safety of vulnerable road users [1], results in high consumption of non-renewable resources [2] and causes a serious threat to the quality of human environments [3] & [4].

As a contemporary solution to existing traffic related issues, encouraging modes of public transport by enhancing service quality attributes is an indispensable policy decision. By identifying the key dimensions that offer value and influence passenger satisfaction, alternative bus strategies can be devised so that more people opt in favour of this service [5]. In many countries different value added services have been introduced to bus transportation with price discrimination so that passengers can choose any service based on affordability. In the Sri Lankan bus transport sector three basic types of services are available: Super-Luxury, Luxury and Semi-Luxury services. However, passenger responses on their satisfaction with these types of services during the years under consideration appear to have been unfavourable.

Statistics reveal that roughly 1,600 public complaints are received annually against the Semi-luxury bus service: the highest incidence of complaints compared to the other types of luxury services [6]. Among Semi-luxury bus routes, the Panadura-Kandy (17) Semi-luxury bus service received a significant number of public complaints. There is scant literature on passenger satisfaction with the Semi-luxury type bus service. Thus, the focus of this paper is to investigate the service quality attributes that influence passenger satisfaction with the Semi-luxury bus service on the Panadura-Kandy (17) route using descriptive and econometric analyses.

2. Objectives

The study predominantly has three objectives. First, the study assesses passenger satisfaction with the Semi-luxury bus service on Panadura-Kandy (17) route. Secondly, the study examines important service quality factors/attributes that influence passenger

satisfaction. Finally, the study evaluates the quality factors/attributes identified and as certain the significance of these factors in order to determine the quality improvement priorities in order to enhance passenger satisfaction.

3. Methodology

A structured questionnaire was used to collect data, and passengers were asked to rate different quality factors/attributes of the service provided and their overall satisfaction. Passengers were interviewed at three locations; Panadura, Nugegoda and Kaduwela.

The key quality factors/attributes (reasonableness of fare, cleanliness, comfort, bus condition, crew discipline, efficiency, loading level, privacy, punctuality, safety) that influenced passenger satisfaction used in this study were selected on the basis of a literature survey and secondary data collected from the National Transport Commission. On average, eight Semi-luxury buses operate on the Panadura-Kandy route and around 400 passenger trips originate daily at the Panadura bus terminal. Among the population, 100 passengers were randomly selected as the sample.

A descriptive analysis and econometrics analysis using the Ordered Logit model were carried out to measure the importance of variables in determining passenger satisfaction.

4. Results and Discussion

The sample consists of 40% female and 60% male passengers of different age groups. The majority was of the 30-39 age group and made up 48% of total passengers. Passengers have a good familiarity of the level of service on this route as 87% of passengers use this service for different purposes more than average. As per the descriptive results of overall passenger satisfaction, 43% of passengers are dissatisfied, 28% passengers are satisfied with this service, and 29% are neutral in their responses.

For econometrics model estimations, the dependent variable (Y=Passenger satisfaction) denotes five threshold points.

$Y_i = 1$	“Highly dissatisfied”	if $Y^*i \leq \delta_1$
$Y_i = 2$	“Dissatisfied”	if $\delta_1 \leq Y^*i \leq \delta_2$
$Y_i = 3$	“Neutral”	if $\delta_2 \leq Y^*i \leq \delta_3$
$Y_i = 4$	“Satisfied”	if $\delta_3 \leq Y^*i \leq \delta_4$
$Y_i = 5$	“Highly satisfied”	if $Y^*i \geq \delta_4$

Table 1: Statistical Summary on Variable Estimation

	OSATIS	CLEANLIN	COMFORT	CONDITION	DISCIPLINE	EFFICIENCY
Mean	2.830000	3.840000	3.210000	3.540000	3.240000	3.670000
Median	3.000000	4.000000	3.000000	4.000000	3.000000	4.000000
Maximum	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000
Minimum	1.000000	2.000000	2.000000	2.000000	2.000000	2.000000
Std. Dev.	0.964575	0.971513	0.890976	0.809290	0.753711	0.766139
Skewness	0.208903	-0.340325	0.266427	-0.359830	-0.139301	-0.313279
Kurtosis	2.210005	2.083476	2.305852	2.583906	2.272314	2.828939
Jarque-Bera	3.327725	5.430414	3.190731	2.879355	2.529776	1.757657
Probability	0.189406	0.066191	0.202834	0.237004	0.282271	0.415269
Sum	283.0000	384.0000	321.0000	354.0000	324.0000	367.0000
Sum Sq. Dev.	92.11000	93.44000	78.59000	64.84000	56.24000	58.11000
Observations	100	100	100	100	100	100

Table 2: Statistical Summary on Variable Estimation

	FARE	LOADING	PRIVACY	PUNCTUALITY	SAFETY
Mean	3.140000	2.980000	3.050000	3.290000	3.060000
Median	3.000000	3.000000	3.000000	3.000000	3.000000
Maximum	4.000000	5.000000	4.000000	4.000000	5.000000
Minimum	2.000000	1.000000	2.000000	2.000000	1.000000
Std. Dev.	0.603358	0.738275	0.743660	0.624338	0.749680
Skewness	-0.065225	-0.120128	-0.079607	-0.292511	0.047302
Kurtosis	2.657175	3.073466	1.828924	2.347209	2.917677
Jarque-Bera	0.560609	0.263002	5.819873	3.201611	0.065530
Probability	0.755554	0.876778	0.054479	0.201734	0.967766
Sum	314.0000	298.0000	305.0000	329.0000	306.0000
Sum Sq. Dev.	36.04000	53.96000	54.75000	38.59000	55.64000
Observations	100	100	100	100	100

The mean value of the overall satisfaction (OSATIS) is 2.9 ($2.9 < 3$) and this reflects that passengers are dissatisfied with the quality factors/attributes of this service. In addition, a majority of people were dissatisfied with the loading level (Mean=2.9) and this reveals that the load factor is higher than the specified service level ($LF > 1$).

Table 3: Probability Values of Overall Passenger Satisfaction (OSATIS)

	OSATIS_1	OSATIS_2	OSATIS_3	OSATIS_4	OSATIS_5
Mean	0.050009	0.375847	0.284075	0.259895	0.030174
Median	0.001263	0.264457	0.256330	0.099011	0.000479
Maximum	0.863513	0.900397	0.631995	0.876324	0.774975
Minimum	1.76E-07	6.39E-05	0.000412	2.20E-05	9.58E-08
Std. Dev.	0.154451	0.335788	0.227376	0.314115	0.118083
Skewness	4.099225	0.316272	0.245255	0.966779	5.233746
Kurtosis	19.80357	1.500621	1.537396	2.358551	29.93274
Jarque-Bera	1456.560	11.03436	9.915881	17.29210	3478.921
Probability	0.000000	0.004017	0.007027	0.000176	0.000000
Sum	5.000889	37.58468	28.40750	25.98950	3.017432
Sum Sq. Dev.	2.361658	11.16261	5.118281	9.768126	1.380420
Observations	100	100	100	100	100

Table 4: Overall Summary of Model Estimation-Ordered Logit

Dependent Variable: OSATIS				
Method: ML - Ordered Logit (Quadratic hill climbing)				
Date: 03/26/18 Time: 00:06				
Sample: 1 100				
Included observations: 100				
Number of ordered indicator values: 5				
Convergence achieved after 6 iterations				
Covariance matrix computed using second derivatives				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
CLEANLIN	0.629374	0.398000	1.581343	0.1138
COMFORT	1.004817	0.339601	2.958814	0.0031
CONDITION	-0.404254	0.524346	-0.770967	0.4407
DISCIPLINE	0.078615	0.378795	0.207539	0.8356
EFFICIENCY	0.682294	0.364789	1.870381	0.0614
FARE	1.186304	0.468533	2.531955	0.0113
LOADING	1.417858	0.412002	3.441388	0.0006
PRIVACY	0.937179	0.372936	2.512977	0.0120
PUNCTUALITY	1.175494	0.490998	2.394092	0.0167
SAFETY	0.942601	0.383553	2.457551	0.0140
Limit Points				
LIMIT_2:C(11)	17.85639	2.656550	6.721647	0.0000
LIMIT_3:C(12)	23.75365	3.228476	7.357545	0.0000
LIMIT_4:C(13)	26.73308	3.503472	7.630453	0.0000
LIMIT_5:C(14)	32.17265	4.148652	7.754964	0.0000
Pseudo R-squared	0.473068	Akaike info criterion		1.679766
Schwarz criterion	2.044490	Log likelihood		-69.98831
Hannan-Quinn criter.	1.827377	Restr. log likelihood		-132.8222
LR statistic	125.6679	Avg. log likelihood		-0.699883
Prob(LR statistic)	0.000000			

As per the overall summary results of the Ordered Logit model estimation, the probability (p) values for the factors are: comfort p= 0.0031, fare p= 0.0113, loading p= 0.0006, privacy p= 0.0120, punctuality p=0.0167 and safety p=0.0140. This denotes that all these variables have P values of less than 5% of significant level, demonstrating a high statistical relationship with passenger satisfaction. Accordingly, coefficients of the above variables are statistically significant.

The total probability that passengers fall into “Satisfied” or “Highly satisfied” categories is 0.2900 and total probability that they fall into “Dissatisfied” or “Highly dissatisfied” categories is 0.4258.

5. Conclusion

The findings of the study reveal that passengers are not satisfied with the service provided by Semi-luxury buses on the Panadura-Kandy route. Overall, among the quality factors, passengers are mostly dissatisfied with the loading level during the journey. The model estimations reveal that the underlying quality factors of comfort,

fare, loading, privacy, punctuality and safety are statistically significant and have a significant relationship with passenger satisfaction.

As per passenger opinions, the Semi-luxury bus service on the Panadura-Kandy route is almost similar to the normal bus service in spite of one quality attribute: efficiency. This revealed that passengers use this service to reach their destinations without any delay. Of the passengers in question, 32% suggested a possible ban of this service as it provides a service similar to normal buses. However, 45% of passengers suggested that it is good to improve the quality of service through government intervention, instead of a ban. The study thus provides a direction for transport regulators to improve service quality by imposing and enforcing rules and regulations to maintain standards of the service while enhancing service frequency to cater to existing passenger demand. Further studies should be carried out by selecting several Semi-luxury bus routes to generalize these survey results.

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