Efficacy of City Bus Service in Thimphu Thromde Service and Service Need Assessment

Phurba Sonam Waiba and Tenzin Chophel

Abstract

With the growing number of population and vehicles, traffic congestion is common worldwide. And a good public transport system is a necessity to curb the issue.Thimphu Thromde, the most populous city in Bhutan is currently witnessing problems of public transportation and its related consequences.

Hence service quality of the city buses and service need assessment has been carried out in this study using the model of service quality (SERVQUAL). A sample of 380 respondents in Thimphu Thromde were surveyed through randomly distributed ques-tionnaire. The data for this study was analysed using the statistical package for social sciences version 21. The study found that there is a significant difference between perceived and expected services from the city bus system, also the quality of service is low and unsatisfactory to the public. Reliability (-1.28) has the highest negative gap followed by Tangibles (-1.15) and Empathy (-1.03 each) of the system as per the SERVQUAL instrument. Specifically, the city bus timing, routes/lack of connectivity, lack of adequate resource and capacity of parking are some of the major problems. Thus, there is a need to increase routes and connectivity of the buses, construct better city bus stand and parking, and construct enough bus stop points for better and prompt services to the people. The responses in the need assessment also indi -cated that 92 percent of the respondents would avail the service if it met their expectation in future. And the people are aware of the fact that public transport system is cheap, efficient and economically satisfying.

Keywords: *Service Quality, Public Transportation, SERVQUAL*

Thimphu Thromde is the capital city of Bhutan, the most populous district of the country. With the growing number of population until recently Thimthrom has about 114,551 residents as per Population and Housing Census report 2017. The figure itself is a clear indication of the fact that there is a need for transportation services in the city. And no sooner was the pressure of inadequacy of the transport services was felt, than the number of private vehicles and taxi/cab services boomed in the country. As per the record of Annual Info-Comm and Transport Statistical Bulletin 2017, there are 43,625 vehicles in the Thromde alone consti-tuting about 51.78 percent of the total number of vehicles in the country. On the other hand the bulletin also recorded that 2832 (66.98 percent) taxi/cabs are in the Thromde alone. Hence the rise in number of vehicles have led to impounding affects to the city, roads, traffic, people, and environment to name few.

Increased travel demand have led to using private vehicle similar to many other countries. Taxi fare is much expensive but comfortable for the people but it has been felt economically a necessity to own a private car. According to the Annual Info-Comm and Transport Statistical Bulletin 2017, vehicle growth rate in the country is 12.11 percent and it is a matter of economic concern for the country to head the same direction. Perhaps a good

public transport system is a necessity in the places like the capital city of Bhutan Thimphu Thromde.

Thus, Royal Government of Bhutan with Road Safety and Transportation Authority spearheading the issue intervened with urban transport/city bus services to ease the issue. The city bus services in Thimphu is operated by Bhutan Postal Corporation Limited and other three private firms. A total of 52 buses are operational on the 15 routes with limited frequency (MoIC, 2017). The Office of City Bus Services have been trying to tackle the issue and the problem seem to get diluted, except during the morning and evening rush hours. Having said that, 52 buses on the road with limited frequencies and routes and catering to more than hundred thousand plus population is absolutely crazy. Many people do not use city bus service due to the fact that our city bus system is already over-crowded and conventional with limited numbers. People concern for less waiting time and reliability of the system, capacity and routes of the buses. Many are facing trouble to afford taxi fare and given a chance many would not refuse to avail city bus services. Having said that there are many new reforms such as bus information technology and enhanced bus stop points and terminals by the office of city bus services and Thimphu Thromde.

Yet the issue pertaining to public transportation has always been confusing and challenging, hence this study will try to seek the understanding on the service quality of the city buses from those who have/are availing the service and additional bus service need assessment from those who have not been able to avail the service in the Thromde. Keeping service quality as the core area of interest and importance of any business performance (Stefano, Casarotto, Barichello, & Sohn, 2015), (Chatzoglou, Chatzoudes, Vraimaki, & Leivaditou, 2014) the model of service quality (SERVQUAL) or the gap theory has been adopted which will guide the research as to what practical recommendations can be made to the related stakeholders as it is still in the conceptualization stage.

Objective

The objective of this research is to assess the efficacy of city bus services in Thimphu Thromde by understanding current service delivery system of the City Bus Service with further evaluation of factors and dimensions associated through the SERVQUAL instrument and carry out service need assessment. The following are the hypotheses made prior to the study.

$H_0$1: There is no significant difference between perceived and expected overall city bus service quality in Thimphu Thromde (RESPONSIVENESS, ASSURANCE, TANGIBLITY, EMPATHY, and RELIABILITY)

$H_1$1: there is a significant difference between perceived and expected overall city bus service quality (RESPONSIVENESS, ASSURANCE, TANGIBLITY, EMPATHY, and RELIABILITY).

Literature Review

The model of Service Quality Concept

SERVQUAL is a multi-dimensional research instrument, which is designed to assess expectations and perceptions of a service (Yousapronpaiboon, 2014). It is based on expectancy-disconfirmation paradigm, which means whether the consumers' expectation of the quality of service is confirmed or not by their actual perception of the service experience (Sabir, Javed, Ahmad, Noor, & Munir, 2014). The SERVQUAL instrument was first tried in the early 1980s by a team of three American researchers viz, Parasuraman, Zeithaml and Berry to measure quality in the service sector (Yousapronpaiboon, 2014). Later in 1985, they conceptualized with subsequent pre-tests, tests and refinement (Parasuraman, Zeithaml, & Berry, 1988). It was a major breakthrough in measurement methods in service quality research (Yousapronpaiboon, 2014).

SERVQUAL Dimensions and Instruments

During the origin of SERVQUAL scale, there were ten dimensions which after further testing it was reduced from ten to five dimensions (Islam, Chowdhury, Sarker, & Ahmed, 2014), (Yousapronpaiboon, 2014). According to Parasuraman, Zeithaml, and Berry, (1988), the five dimensions are identified as follows:

Table 1. Five dimensions of SERVQUAL model with number of items and definition.

Dimension	No. of Items	Description
Responsiveness	*4*	*the willingness to help customers and to provide prompt service.*
Assurance	*3*	*the knowledge, courtesy of employees and ability to convey trust and confidence in the customer towards the service provider.*
Tangibles	*6*	*the appearance of physical facilities, equipment, personnel and communication materials.*
Empathy	*4*	*the provision of caring, individualized attention provided to customers.*
Reliability	*5*	*the ability to perform the promised service dependably and accurately.*

A total of 22 scale items were derived from these dimensions, and each item is measured on two responses; the customer expectations concerning a service (E) and the perception of the actual service delivered by the service sector (P) (Parasuraman, Zeithaml, & Berry, 1988).

Model of Service Quality and Gap Theory

In this method, service quality is the gap between perceived service and expected service, hence it is also known as gap theory (Pradela, 2015), (Kumar & Muthupandian, 2012). In the gap theory of service quality;

Q = P - E (Quality = Perceptions – Expectations)

Where a positive gap score would mean that expectations have been met or exceeded and service quality is perceived to be satisfied. Similarly, a negative gap score would

mean that expectations have not been met and quality is unsatisfactory (Yousapronpaiboon, 2014), (Parasuraman, Zeithaml, & Berry, 1988).

Table 2. Examples of matched pairs of items in the SERVQUAL questionnaire.

Dimension	Eg. of Expectation Item	Eg. of Perception Item
Responsiveness	*Company should provide timely and efficient service*	*Company provides timely and efficient service*
Assurance	*Company employees should be trustworthy*	*Company employees are trustworthy*
Tangibles	*Company should have adequate resource and technology*	*Company has adequate resource and technology*
Empathy	*Company should always look after interests of the customer*	*Company always looks after interests of the customer*
Reliability	*Company should render services as and when required*	*Company renders services as and when required*

Thus, the model of service quality or the gap theory conceptualized the SERVQUAL model. Gap scores can be analysed for each individual statement and can be aggregated to give an overall gap score for each dimension (Yousapronpaiboon, 2014).

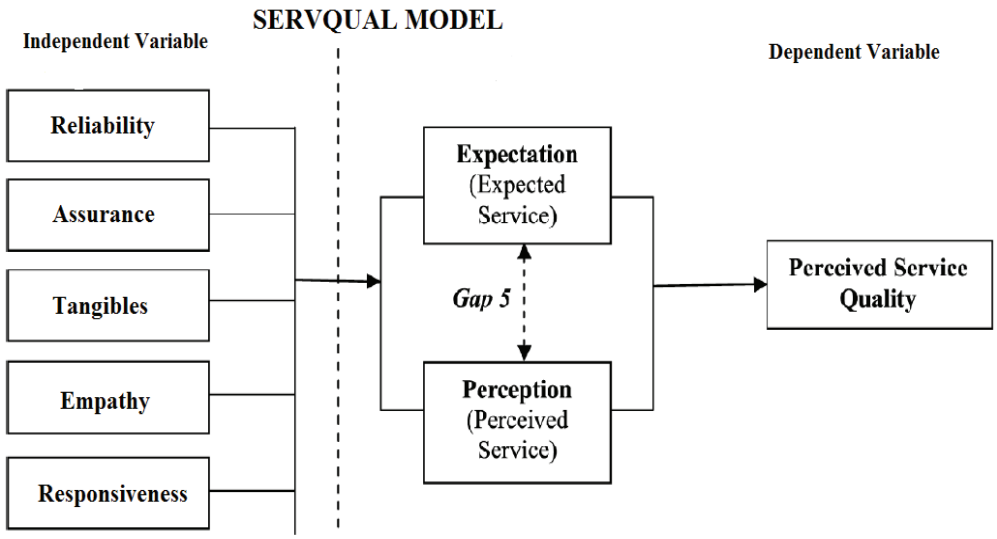

Figure 1. Diagrammatic representation of Theoretical framework.

Related Work

So far there is no literature and studies carried out in Bhutan pertaining to public transportation. But similar research attempts have been made in other countries using the same model which was successful in making recommendations to the transport service provider. A case study in Pakistan transport service confirmed that the model was very relevant to study transport service quality, it tried to assess the impact of SERVQUAL dimensions on the passenger satisfaction and found that all the five dimensions of the model were positively correlated to passenger satisfaction (Sabir, Javed, Ahmad, Noor, & Munir, 2014). Another study in India was conducted to see the quality attributes that influenced passenger satisfaction and found that comfort and safety was the most important factor in the context of their public

transport service provider. The study also found that accessibility and capacity of the transport service were key factors to the quality of services offered to the passengers (Sanjay, 2016). Similarly, Kumar & Muthupandian, (2012) found that the highest expectation of passengers is "ASSURANCE" meaning the passengers are more concerned about the safety and security, indicating negative score/dissatisfaction with it. And in case of perception, "RESPONSIVENESS" was highest which in other words meant that the service provider were active and responsive catering to the needs of the passengers at all times. Hence the SERVQUAL model has been found fit and applicable in this study to assess service quality of city bus service in Thimphu Thromde, which would enable related stakeholders make necessary interventions for future.

Methodology

The study is based on quantitative analysis, which is more about assessing the service quality and service need assessment of the city bus system in the Thromde. The data was collected through randomly distributed questionnaires through convenience sampling method.

The questionnaire was developed from the SERVQUAL model, in which there were three sections as follows;

Section A: General Profile to collect demographic details of the respondents such as gender, age, occupation, reason for transportation and primary mode of transportation used.

Section B: Expectation of Service and Perception of Service (same 22 items in five-point likert-type scale of strongly agree, agree, undecided, disagree and strongly disagree were used).

Section C: City Bus Need Assessment which covered preference for secondary mode of transportation, whether respondents would want city bus service if enhanced and improved and general comments.

Study Population and Sampling

Since the sample population was very large (100,000 plus) the study adopted the method postulated by Shekaran, (2003). Based on the method the sample size can range from 380-384 if the sample population is more than 100,000. Hence the sample size was 380.

Data Analysis Methods-Statistical Planning

The data for this study was analyzed using the Statistical Package for Social Science Software (SPSS) version 21. The SERVQUAL score was calculated between perceived service and expected service with respect to the following measures: responsiveness, assurance, tangibles, empathy and reliability. Each dimension score was obtained by calculating the difference (means of responses) between the perceived (P) and expected (E) service scores (SERVQUAL score = P- E). The data was also analysed through paired sample t-test to compare means and see the significant difference between expectation and perception of the services.

General profile information was used to obtain basic data of the respondents and used as supportive figures in the discussion and finally SERVQUAL score and city bus need assessment data were used for recommendation.

Findings and Discussion

General Profile: the survey was responded by a total of 380 respondents of which 88 percent were residents of Thimphu. Among the respondents 58 percent were male and 42 percent were female. It could be also noted that majority of the responses came from the elderly aged between 21 to 31 years. On the other hand the largest section of the respondents were public sector employees (55 percent) followed by unemployed youth and students. Hence it could be clearly understood that the primary reason for movement within Thimphu Thromde is travelling home to office and office to home (60 percent) followed by movement for personal works (32 percent). And as discussed earlier, the primary mode of transportation for most of the respondents were personal vehicle (39 percent), and then it is taxi/cabs (36 percent). Taking a note to use of city buses as primary mode of transportation it has been found just few (15 percent) of the respondents avail the service, and it includes all the private/company buses/school buses along with the public city buses.

Expectation and Perception of Service: this section includes the expectation and perception of those 15 percent respondents who have used the city bus services. As discussed in the literature and conceptual framework the analysis have been made in accordance to the SERVQUAL instrument. In the larger context, it has been found that the services provided by the city bus system have not been able to meet the passengers' expectation, as gap score is negative (-1.0), hence according to Parasuraman, Zeithaml and Berry, (1988), a negative gap score would mean that expectations have not been met and service quality is presumed to be unsatisfactory. On the other hand p value (0.00) is less than 0.05 at 95% confidence level, hence there is a significant difference between perceived and expected services of the city bus system.

Taking individual dimension for better understanding; out of the five dimensions (RATER-responsiveness, assurance, tangibles, empathy and reliability), RELIABILITY (-1.28) has the highest negative gap followed by TANGIBLES (-1.15), EMPATHY (-1.03), RESPONSIVENESS (-0.93) and ASSURANCE (-0.83).

Table 3. Mean scores of Perception (P), Expectation (E) and Gap (G) items of RESPONSIVENESS.

RESPONSIVENESS	**P**	**E**	**G**
1.City bus association should always inform people about change of timetable and prices in advance	3.72	4.72	-1.00
2.City bus association should provide timely and efficient service	4.03	4.90	-0.86
3.Staff should communicate with passengers clearly and helpfully	3.97	4.86	-0.90
4.City bus staff should be readily willing and handle problems/complains with care and seriousness	3.90	4.86	-0.97
MEAN	*3.91*	*4.84*	*-0.93*

Table 4. Paired Sample t-test of RESPONSIVENESS.

	Paired Differences					t	df	Sig.(2-tailed)
	M	SD	SEM	95%Confidence Interval of the Difference				
				Lower	Upper			
RESPONSIVENESS (P-E)	0.93	1.32	0.25	0.43	1.43	3.82	28.00	0.001

Table 3, shows that there is (-0.93) mean gap between perceived and expected service quality of the dimension RESPONSIVENESS which means that expectations have not been met and service quality is presumed to be unsatisfactory. Likewise table 4 indicates that the p value is (0.001) which is less than 0.05 at 95% confidence level. Hence it can be concluded that there is a significant difference between perceived and expected service in the dimension RESPONSIVENESS.

Table 5. Mean scores of Perception (P), Expectation (E) and Gap (G) items of ASSURANCE.

ASSURANCE	P	E	G
5.Passengers should feel safe in their transactions with staff on the bus and in the bus stand	4.24	4.76	-0.52
6.City bus staff should be always polite and approachable	3.79	4.83	-1.03
7.City bus staff should have in-depth occupational knowledge of their jobs	3.83	4.76	-0.93
MEAN	*3.95*	*4.78*	*-0.83*

Table 6. Paired Sample t-test of ASSURANCE.

	Paired Differences					t	df	Sig. (2-tailed)
	M	SD	SEM	95% Confidence Interval of the Difference				
				Lower	Upper			
ASSURANCE (P-E)	0.83	1.07	0.20	0.42	1.23	4.11	28.00	0.001

Table 5, shows that there is (-0.83) mean gap between perceived and expected service quality of the dimension ASSURANCE which means that expectations have not been met and service quality is presumed to be unsatisfactory. Likewise table 6 indicates that the p value is (0.001) which is less than 0.05 at 95% confidence level. Hence it can be concluded that there is a significant difference between perceived and expected service in the dimension ASSURANCE.

Table 7. Mean scores of Perception (P), Expectation (E) and Gap (G) items of TANGIBLES.

TANGIBLES	**P**	**E**	**G**
8.City bus online services should be flawless	3.59	4.66	-1.07
9.City bus seats should be comfortable and cozy	3.79	4.72	-0.93
10.City buses should be clean and are equipped with modern technologies	3.45	4.62	-1.17
11.City bus stand should have adequate resource and capacity	3.34	4.66	-1.31
12.City buses should have enough bus stop points	3.72	4.79	-1.07
13.City bus should have routes/connectivity services in all places within the thromde	3.55	4.90	-1.34
MEAN	*3.57*	*4.72*	*-1.15*

Table 8. Paired Sample t-test of TANGIBILITY.

	Paired Differences					**t**	**df**	**Sig. (2-tailed)**
	M	**SD**	**SEM**	**95% Confidence Interval of the Difference**				
				Lower	Upper			
TANGIBILITY (P-E)	1.15	1.34	0.25	0.64	1.66	4.63	28.00	0.000

Table 7, shows that there is huge (-1.15) mean gap between perceived and expected service quality of the dimension TANGIBILITY which means that expectations have not been met and service quality is presumed to be unsatisfactory. Likewise table 8 indicates that the p value is (0.000) which is less than 0.05 at 95% confidence level. Hence it can be concluded that there is a significant difference between perceived and expected service in the dimension TANGIBILITY.

Table 9. Mean scores of Perception (P), Expectation (E) and Gap (G) items of EMPATHY.

EMPATHY	**P**	**E**	**G**
14.City buses should always look after the best interest of the passengers	3.72	4.66	-0.93
15.City bus association should have operating hours convenient to all the passengers	3.38	4.59	-1.21
16.City buses should have first aid box and emergency kits (fire extinguisher, emergency exit etc.)	3.62	4.62	-1.00
17.City buses should have reserved seats for disabled, old and women	3.72	4.69	-0.97
MEAN	*3.61*	*4.64*	*-1.03*

Table 10. Paired Sample t-test of EMPATHY.

	Paired Differences					t	df	Sig. (2-tailed)
	M	SD	SEM	95% Confidence Interval of the Difference				
				Lower	Upper			
EMPATHY (P-E)	1.03	1.27	0.24	0.54	1.51	4.37	28.00	0.000

Table 9, shows that there is huge (-1.03) mean gap between perceived and expected service quality of the dimension EMPATHY which means that expectations have not been met and service quality is presumed to be unsatisfactory. Likewise table 10 indicates that the p value is (0.000) which is less than 0.05 at 95% confidence level. Hence can be concluded that there is a significant difference between perceived and expected service in the dimension EMPATHY.

Table 11. Mean scores of Perception (P), Expectation (E) and Gap (G) items of RELIABILITY.

RELIABILITY	P	E	G
18.The city bus should always arrive and depart on time	3.24	4.86	-1.62
19.City buses should never break down on the way	3.38	4.48	-1.10
20.It should be very easy to book/buy city bus tickets	3.86	4.83	-0.97
21.City bus staff should satisfy passengers request immediately	3.45	4.55	-1.10
22.The timetable of the city bus service should be error free	3.14	4.72	-1.59
MEAN	*3.41*	*4.69*	*-1.28*

Table 12. Paired Sample t-test of RELIABILITY.

	Paired Differences					t	df	Sig. (2-tailed)
	M	SD	SEM	95% Confidence Interval of the Difference				
				Lower	Upper			
RELIABILITY (P-E)	1.28	1.46	0.27	0.72	1.83	4.70	28.00	0.000

Table 11, shows that RELIABILITY has the highest (-1.28) mean gap score between perceived and expected service quality, which means that expectations have not been met and service quality is presumed to be unsatisfactory. Likewise table 12 indicates that the p value is (0.000) which is less than 0.05 at 95% confidence level. Hence it can be concluded

that there is a significant difference between perceived and expected service in the dimension RELIABILITY.

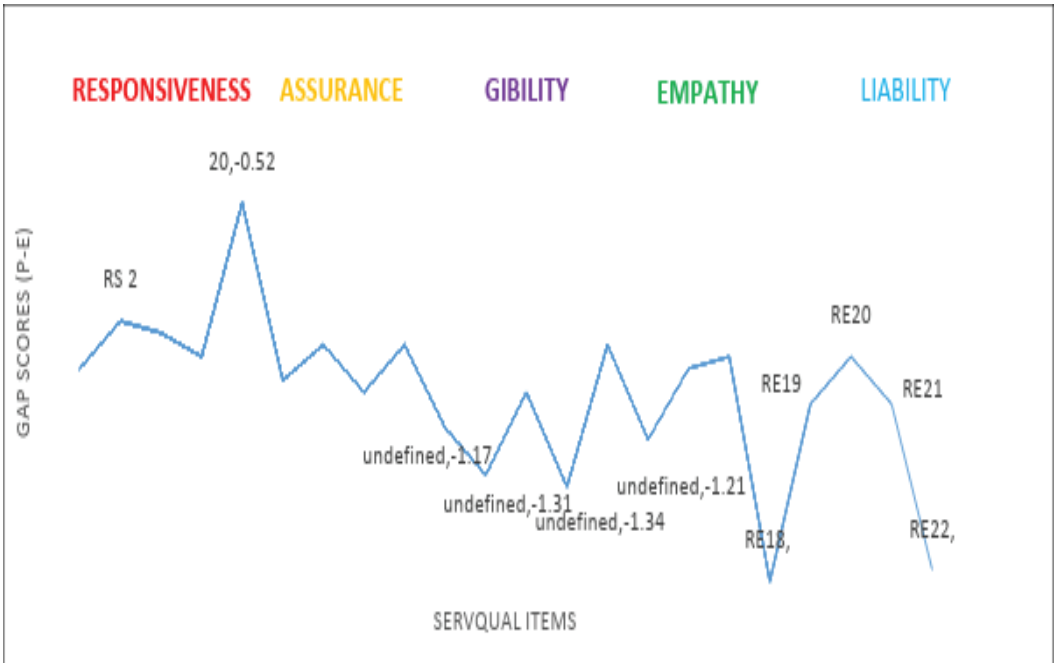

Figure 2. Comparative gap scores of the 22 items of five SERVQUAL dimensions.

In a nutshell, the findings according to the SERVQUAL instrument indicates that item wise, the highest gap score is in item RE18 (-1.62) and RE22 (-1.59) of reliability, item T13 (-1.34), T11 (-1.31) and T10 (-1.17) of tangibility and item E15 (-1.21) of empathy indicating that the quality of services delivered by city bus service does not meet passengers expectation. Similarly, the lowest gap score is in item A5 (-0.52) of assurance indicating certain degree of service quality in terms of assurance (this does not mean that passenger's perception have met/exceeded their expectation, as it is still negative). Also most of the items are within the range of gap score -0.86 to -0.10 and this can also be attributed to having low service quality and the services being unsatisfactory.

Paired Samples Test								
	Paired Differences					t	df	Sig.(2-tailed)
	M	SD	SEM	95% Confidence Interval of the Difference				
				Lower	Upper			
RESPONSIVENESS (P-E)	0.93	1.32	0.25	0.43	1.43	3.82	28.00	0.001
ASSURANCE (P-E)	0.83	1.07	0.20	0.42	1.23	4.11	28.00	0.001
TANGIBILITY (P-E)	1.15	1.34	0.25	0.64	1.66	4.63	28.00	0.000
EMPATHY (P-E)	1.03	1.27	0.24	0.54	1.51	4.37	28.00	0.000
RELIABILITY (P-E)	1.28	1.46	0.27	0.72	1.83	4.70	28.00	0.000
OVERALL (P-E)	**1.04**	**1.29**	**0.24**	**0.55**	**1.53**	**4.33**	**28.00**	**0.000**

Table 13. Paired sample test analysis of the overall SERVQUAL between perceived and expected city bus services.

The table shows the paired sample t-test of the five dimensions between perception and expectation. The overall mean standard deviation 1.29 clearly shows that there a large gap between perceived and expected services of the city bus service. On the other hand since the overall p value is less than 0.05 at 95% confidence level, it can be deduced that there is a significant difference between perceived and expected overall city bus service in Thimphu Thromde rejecting the null hypothesis. Hence, it can also be noted that there is a significant difference between perception and expectation of quality of services in all the five dimensions (RESPONSIVENESS, ASSURANCE, TANGILIBILITY, EMPATHY and RELIABILITY) as shown in the above tables.

City Bus Need Assessment: there is no doubt that people aren't aware of the prevailing city bus service in the Thromde, but the reason most do not avail the service could be one of factors discussed above. Hence need assessment was also carried out, the opinion from those respondents who do not use the service. 88 percent of the respondents were positive about availing the bus service if it was up to their expectation and 92 percent of them accepted that it would be cheapest, most efficient and economical and that it would ease traffic congestion, accidents and environmentally suitable for the country.

Conclusion

As we know that the customer satisfaction is indispensable for survival of any kind of business, and precisely for a highly populated city like Thimphu Thromde, the growing number vehicles and taxi/cabs have enormous effect on the road, traffic, people, economy and environment, thus passenger satisfaction and using city bus services effectively will by far reduce and lighten the problem complex.

As Discussed in the results and discussion some of the key findings are; the passengers have indicated all the dimensions negative meaning unsatisfactory and none of the items under these dimensions are positive; RELIABILITY (-1.28) is the top factor leading to dis-satisfaction among the passengers, followed by TANGIBLES (-1.15), EMPATHY (-1.03), RESPONSIVENESS (-0.93) and ASSURANCE (-0.83). On the other hand the paired sample t-test indicated that there is a significant difference between services delivered and expected from the city bus association with as the significant p value is less than 0.05.

Specifically, the city bus timing, routes/lack of connectivity services in all places within the Thromde, lack of adequate resource and capacity has been found to be a big problem. Hence the study recommends following for improvement and betterment in future (refer figure 2);

1. The highest rated item is "the city bus is/should always arrive and depart on time" (-1.62), hence there must be strict and timely compliance and inspection of city bus timing. Prior to the monitoring there must be thorough analysis on traffic congestion and time it would take for the bus to reach/depart in different points and circulate to all so that people do not waste time or get delayed.

2. The item "the timetable of the city bus service is/should be error free" (-1.59), is rated low. This is similar to the above but different as it means that the timetable provided by the city bus association has flaws which is way people land up waiting long for buses or can't catch it even on the time the association have provided, the above recommendation would also take this issue into consideration.

3. The item "city bus should have/has routes/connectivity services in all places within the thromde", (-1.34) is also rated low. Logically the result does justice to the opinion of the respondents and needs of people, as discussed earlier with just more than 15 routes and with limited bus frequency, passengers would undoubtedly face problems traveling by bus. So, possibly routes and connectivity of the buses if enhanced and increased would help dilute this problem.

4. Similarly, the item "city bus stand should have adequate resource and capacity", is also rated low (-1.31), this could mean that the resources and capacity of the bus stands is poor. In fact, city bus stand and taxi parking being together and few benches for the people to wait and sit is one reason, the passengers' could have rated the item low. Thus, construction of city bus stand and arranging necessary resources such as benches and stalls for the people would help solve this problem.

5. And few other items such as bus operating hours (not just limited to morning and evening rush hours), updating the buses with modern technologies and constructing enough bus stop points are some recommendations for better and prompt services to the people.

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