

# Study on Passenger Satisfaction on Bus Terminal Facilities in Colombo City

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## Abstract

The passenger transport service in Sri Lanka is often criticized as low in quality. The quality depends on wider range of service elements and attributes pertinent to this service. Bus terminal facilities are primary elements of bus transportation service and development in these facilities will strengthen the transportation system. Bus stops, bus terminals and depots are the critical infrastructure components of a bus-based transit system. Bus terminals are the nodal points at the beginning and end of journey. Colombo as the major city in Sri Lanka, focus on transportation sector and its current situation is very important for the government to achieve their future plans and for the future developments. The aim of this study is to identify the factors effect on passenger satisfaction on bus terminal facilities in Colombo city area and to determine the level of passenger satisfaction. The research population was the entire passengers of bus transportation in Sri Lanka. Simple random sampling technique was used to determine the respondents of the study and the sample consisted with 276 respondents. Primary data were collected through a survey questionnaire and the collected data were analyzed by using SPSS. Descriptive statistics, Factor Analysis, Cronbach's Alpha test, Cross Tabulation and Hypothesis testing conducted to analyze the collected data. The results show that there are five factors affecting on passenger satisfaction on bus terminal facilities which generated from 20 variables such as Information Facility, Security and Safety, Infrastructures, Accessibility and Amenities. The results show that most of the passenger out of the sample are dissatisfied about the bus terminal facilities in Colombo city area and they are disagreed with the adequacy of the provided services in Colombo city. Respondents have mentioned that the facilities should be improved and should be developed up to a quality standard and the respondents have suggested for further improvement.

**Key words:** Passenger satisfaction, Bus Terminal, Transportation, Information Facility, Security and Safety, Infrastructure, Accessibility.

## I. INTRODUCTION

Providing transportation service which is adequate and appropriate is the challenge that come across in all most all cities in the world. Cities will always have a new problem that arise due to transportation system and in generally large cities in developing countries are highly dependent on road transport. A sustainable city cannot be realized without having a well-planned and strengthening transportation system while transit infrastructure plays a vital role in transport systems and it should be designed to enhance the passenger experience. Increasing urbanization is putting pressure on infrastructure in cities around the world. In the developed world, competition for space to serve the transport needs of city is increasing, at the same time as governments are investing in more sustainable transport modes, such as walking, cycling and public transport modes like light rail and bus rapid transit. Sri Lanka Transport Board is the operator of public bus transportation and responsible to provide shelters/stations/terminals for SLTB busses and also Western Province Road Passenger Transport Authority is the regulator of intra provincial private busses and responsible to provide shelter and terminals for private busses. Most of the bus terminals in Colombo District do not have enough capacity or facilities for handling many busses and also those terminals do not provide enough facilities for the passengers. Due to that people who use these facilities have to face lot of difficulties and it may badly impact on their day today activities. In addition, there are inter modal transport passengers at Fort railway station and this make transfers between public transportation and railway transportation as well as between busses too difficult. Transfer passengers need to use alternative roads around this area.

### **Research Objectives**

Objectives of this research are to

- Identify the factors affecting passenger satisfaction on bus terminal facilities
- Identify the level of passenger satisfaction on bus terminal facilities in Colombo city
- Give recommendations to enhance the quality of terminal facilities in Colombo city

### **Literature review**

Satisfaction can be defined as “fulfillment of a need, demand, claim, and desire”. Customer satisfaction is the measure of how the needs and responses are collaborated and delivered to customer expectations. Satisfied customers are prefer to repurchase the product or service that met expectations. If they feel that the quality of that good or service is low, they may concentrate on substitutes even if they dissatisfied. According to Kim, Park & Jeong, (2004) passenger satisfaction can be indicated as passenger’s feedback to the public of satisfaction, and passenger’s decision of satisfaction level. As per Grigoroudis and Siskos (2010) “Customer satisfaction measurement is now considered as the most reliable feedback, taking into account that it provides in an effective, direct, meaningful and objective way the customers’ preferences and expectations”. Passengers, being the clients of the transport services, expect to have many service elements and qualities from the transport service they use. Oliver (1980) provides a compact conceptual basis for explaining the consumer satisfaction. In the same way customer satisfaction can describe as that they preconceive perceptions regarding future events, they will develop perceptions with regard to the quality of goods or services that they plan to obtain. When

customers purchase goods or services, they compare their realized perceptions with their preconceived expectations. That is the nature of the customers in psychological manner. Psychological satisfaction ultimately occurs when expectations are met during the transaction.

## **Research Methodology**

### **Population**

It has considered all the passengers who use bus terminal facilities in Colombo city area as the population of this research. As the capital city of Sri Lanka most of the people use bus terminal facilities and Colombo Central bus stand, Bastian bus stand and Gunasinghapura bus stand are the main bus terminals in Colombo city area. The population was all the passengers who use these three bus terminals.

### **Sample Size**

Out of the population, sample of 276 passengers were selected on random basis to gather information for this research.

### **Sampling Method**

Simple random sampling inspecting system is superior to non – irregular sampling procedure. This is the purest and the most straightforward probability sampling strategy. Same time each member of the population is equally likely to be chosen as part of the sample. In this research, Colombo has vast population than the other cities in Sri Lanka and therefore need to choose respondents randomly.

## **Data Collection Method**

### **Primary Data**

This research is based on primary data which gathered by using a survey questionnaire distributed among the users of bus terminal facilities in Colombo city area. Questionnaires have been distributed among 300 plus randomly selected users as the sample of this study.

### **Secondary Data**

Secondary data for this research were gathered by using scholarly articles, journals, reports and web pages which are related to passenger satisfaction and bus terminal facilities. Most of these data used for the purpose of conceptualization and as well as for determining the sample, preparation of questionnaire and data analysis.

## **Data Analysis**

### **Hypothesis Testing**

Hypothesis test has been done by using Chi-square test. Basically it can be used to test independence between two variables. If there is a statistically significant correlation between two variables, it indicates from P value.

$H_0$  : Passenger satisfaction on bus terminal facilities is independent from the  $i^{\text{th}}$  factor

$H_1$  : Passenger satisfaction on bus terminal facilities is dependent on  $i^{\text{th}}$  factor

$i^{\text{th}}$  factor = {bus time tables, bus transportation routes, public information, staff member's information, safety, CCTV, lightings, help points, shelter, seating arrangements, sanitary services, waiting areas, intermodal connections, easiness to getting on, better access, parking area, quality foods, ATM, telephone booth, TV}

Table 1: Hypothesis Testing for Factor 1

| Variable             | Test statistic | P - value |
|----------------------|----------------|-----------|
| shelter              | 13.069         | 0,668     |
| seating arrangements | 15.226         | 0.508     |
| sanitary services    | 18.722         | 0.283     |
| waiting areas        | 11.712         | 0.764     |

Source: Author

All the variables from Factor 1 (infrastructure facilities) represent p-value greater than 0.05 and can be accept the null hypothesis, passenger satisfaction not depend on infrastructure variables.

Table 2: Hypothesis Testing for Factor 2

| Variable        | Test statistic | P - value |
|-----------------|----------------|-----------|
| quality foods   | 5.458          | 0.941     |
| ATM             | 6.274          | 0.902     |
| telephone booth | 4.923          | 0.961     |
| TV              | 4.899          | 0.768     |

Source: Author

All the variables from factor 2- amenities represents p-value greater than 0.05 and it proves that quality of foods, ATM, Telephone booth and displaying TV hasn't impact on passenger satisfaction while accept null hypothesis passenger satisfaction not depend on these variables.

Table 3: Hypothesis Testing for Factor 3

| Variable                   | Test statistic | P - value |
|----------------------------|----------------|-----------|
| bus time tables            | 32.017         | 0.010     |
| bus transportation routes  | 25.619         | 0.060     |
| public information         | 28.537         | 0.027     |
| staff member's information | 21.791         | 0.150     |

Source: Author

Under the Factor 3 Information facility, Bus time tables and displaying of public information has p-value less than 0.05 , it proves passenger satisfaction depends on these two variables from factor 3. Null hypothesis can be

reject and accept the alternative hypothesis. Other two variables not impact on passenger satisfaction.

Table 4: Hypothesis Testing for Factor 4

| Variable    | Test statistic | P - value |
|-------------|----------------|-----------|
| safety      | 14.520         | 0.560     |
| CCTV        | 22.145         | 0.139     |
| lightings   | 29.537         | 0.021     |
| help points | 26.522         | 0.047     |

Source: Author

Lightings and help points from the factor 4- Safety and Security represents p-value less than 0.05 means, reject the null hypothesis and accept the alternative that passenger satisfaction depends on those two variables. Other variables of safety and CCTV have p- value greater than 0.05 and passengers satisfaction independent from this variables.

Table 5: Hypothesis Testing for Factor 5

| Variable                      | Test statistic | P - value |
|-------------------------------|----------------|-----------|
| intermodal connections        | 23.801         | 0.094     |
| easiness to getting on busses | 36.210         | 0.003     |
| better access                 | 21.830         | 0.149     |
| parking area                  | 27.628         | 0.035     |

Source: Author

From the factor 5 – Accessibility, easiness to getting on busses and parking area have p-value less than 0.05 which proves accept the null hypothesis, passenger satisfaction depends on these two variables. Intermodal connections and better access have p-value greater than 0.05 and these variables haven't impacton passenger satisfaction.

Pearson's chi square test is used to test the independence between two variables. According to the Pearson's chi square test bus time tables, public information, lightings, help points, easiness to getting on busses and parking area has p value lower than 0.05 which is the decent value that proves passenger satisfaction mostly depends on those variables.

**Reliability Test**

Table 6: Reliability Test

| Reliability Statistics |             |
|------------------------|-------------|
| Cronbach's Alpha       | No of Items |
| <b>.768</b>            | 20          |

Source: Author

According to the test statistic overall data set Cronbach’s Alpha value is 0.768 and it is higher than 0.7 and is acceptable. At the end, it describe that the internal consistency is at an acceptable level.

Table 7: KMO and Bartlett's Test

| KMO and Bartlett's Test                          |                    |          |
|--|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | .786     |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 2096.743 |
|  | df                 | 190      |
|  | Sig.               | .000     |

Source: Author

There should be pro-rata correlation between the variables as a precondition, before applying Factor Analysis. Bartlett’s test shows whether there is an adequate relationship between variables or the intercorrelation. When the p-value of this test is below the significance level of 0.05, it mean that there is an adequate relationship for Factor Analysis. Otherwise, when the test is not significant the variables are not suitable for Factor Analysis. The hypothesis is,

$H_0$ : Correlation matrix is an identical matrix

$H_1$ : Correlation matrix is not an identical matrix.

Since the significant level is 0.000 null hypothesis can be rejected and accept the alternative hypothesis. It means correlation matrix is not an identical matrix and it further support to continue the other steps of factor analysis.

According to the sample data set, the p value of Bartlett’s test of this study was 0.000 and the KMO value is 0.786 that the variables were exactly suitable for Factor Analysis. Normally this is use to check test sufficiency of the sample. Usual scenario to get the KMO test measurement is more noteworthy than 0.6, one might say that sample size is appropriate. This sampling is satisfactory while KMO was greater than 0.60 and the variables were suitable due to p-value was 0.000.

**Discussion of Research Findings**

The initial stage of data analysis, it has done a demographic factor analysis of the respondents. According to the analyzed data majority of the passengers of busses are from male category which represents 68% of the total sample. Balance 32% represents female category and most of the passengers from age range between 36- 45 years with the percentage of 36.2%. Most of the respondents from the sample are educated up to Advanced Level and as a percentage of 47.5%. Also this study has found that most of the passengers in Colombo city area are private sector employees and it gives 46.7% out of the sample. As per the collected data, 63% of the passengers use the terminal facilities and travel by buses with the purpose of working. According to the cross tabulation, most of the time passengers are strongly dissatisfied on bus terminal facilities in Colombo city area. At the same time passengers are disagree on the positive statements which is in the questionnaire about bus terminal facilities.

Also they have marked agree for the statements related to need of facilities such as amenities. The primary objective of this research is to identify the factors affecting to passenger satisfaction toward bus terminal facilities in Colombo city area and that objective has been reached by performing a factor analysis. There are 20 variables in this research which affects to passenger satisfaction and those variables grouped and reduced up to 5 factors such as information facility, safety and security, infrastructure, accessibility and amenities. In the cross tabulation analysis it concludes that how passenger satisfaction be influenced from these 20 variables. The secondary objective of this research is to measure the impact level of passenger satisfaction on bus terminal facilities in Colombo city. When analyze the overall satisfaction level, totally 92% of the sample are not satisfied with the facilities in Colombo bus terminals and it describe that the provided facilities are not enough and are not up to a good standard. Then the hypothesis testing conducted to identify whether passenger satisfaction on bus terminal facilities independent from its factors which are the variables of this study. Pearson's chi square test is used to test the independence between two variables and bus time tables, public information, lightings, help points, easiness to getting on busses and parking area has p value lower than 0.05 which is the decent value that proves passenger satisfaction mostly depends on those variables.

### **Limitations of the Research**

There are several limitation areas related with this study. This research based on the primary data and data were collected by distributing questionnaires to respondents in Colombo city area. Questionnaires were distributed to randomly selected passengers in Colombo city and this study mainly based in Sri Lankan geographical context focused only on three bus terminals in Colombo city as Central Bus stand, Gunasinghepura Bus stand and Bastian bus stand. Also passengers were excited during the peak hours and difficult to collect accurate data from the respondents. On the other hand, most of the respondents not fully understand the topic and the questionnaire due to language difficulties. Hence the responses may not perfectly appropriate to the research.

### **Recommendation for Future Research**

For future research it is recommended to take a large sample more than this study it will be generated more accurate results on passenger satisfaction. Also it is recommended to take the sample based on other districts and cities to cover whole population in Sri Lanka and can be consider other main bus terminals in Sri Lanka. In Sri Lankan context, there are few studies based on passenger satisfaction towards bus terminal facilities it will be worth to do an investigation. On the other hand, further researchers can be consider more variables other than this study based on bus terminal guide lines. This study is not developed a regression model and the future research can be done a regression model to identify the impact of bus terminal facilities on passenger satisfaction.

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