

# An Empirical Study on User Satisfaction in Public Transport System

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**Abstract**—With the increase in population in metro cities and specially being the capital of India, Delhi-NCR is facing many problems in adjusting with the increasing population. Public transportation is a conveyance that provides continuing general or special transportation to the public and show that public transportation plays a significant role as it improves the quality of our day to day life by expediting traffic saves money and creates new jobs. The specific objective of this study are to study the satisfaction level of the various users of public transportation system and identify the most influencing determinants of satisfaction and To study the impact of gender and age on the level of satisfaction on public transportation system. Sample size of 200 was taken for this research and 192 responses were qualified for research. It is found that satisfaction level between male and female customers of public transport system are significantly different in Staff service. Proper network connection, Adequate service frequency, Convenient time schedule, Safety measures from accidents, Cleanliness of the vehicle and Staff service are the factors for which there is significant difference between different age groups in level of customer satisfaction.

**Keywords:** Public Transportation, Customer Service, Demography and Determinants of Satisfaction.

## 1. INTRODUCTION

With the increasing population in various metro cities like Delhi, there are assortments of problems which various people do face. One of the major problems out of the various problems is the transportation system in NCR. A major part of the population in Delhi uses Public Transport, due to various reasons like affordability, accessibility, etc. Prior to independence in 1930s, public transport in the city was in private hands, with people relying mainly on tongas and the bus services of the 'Gwalior Transport Company' and 'Northern India Transport Company'. But with the growing city, it soon proved inadequate, thus Delhi Transport Corporation (DTC) bus system was established in May 1948. The next big leap in city transport was the opening of Delhi Metro, a rapid transit system in 2002. But there is always a question which arises that is the transportation system in NCR is perfect, and if not what are the various problems and what could be the possible solutions for the same. The present scenario of transportation in Delhi-NCR is facing lot many problems. With the increase in population in metro cities and

specially being the capital of India, Delhi-NCR is facing many problems in adjusting with the increasing population. The worsening traffic congestion and deteriorating safety conditions on Delhi roads projects a grim profile of the capital city. The number of vehicles on Delhi roads has increased substantially in recent years. Some of the major corridors are carrying more than lakh vehicles a day. As a result, both travel time and the number of road accidents in Delhi have registered and increasing trend. It is important to summarize knowledge about what drives customer satisfaction and dissatisfaction in public transport area to design an attractive and marketable public transport.

## 2. LITERATURE REVIEW

The quality of services provided can be evaluated by the perceptions and expectations of customers (Eboli & Mazulla, 2011) and Satisfaction can be defined as an experience of fulfillment of an expected outcome. Satisfaction or dissatisfaction with a program or facilities is influenced by prior expectations regarding the level of quality (Sigala, 2004). According to Oliver (1997), satisfaction is defined as the customer's fulfillment. It is a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or over-fulfillment. Need fulfillment is a comparative processes giving rise to the satisfaction responses. Any gaps lead to disconfirmation; i.e., Positive disconfirmations increases or maintain satisfaction and negative disconfirmation create dissatisfaction.

Several studies regarding satisfaction and dissatisfaction in public transport has been conducted to develop and create attractive public transport. Tran and Kleiner (2005) define public transportation as a conveyance that provides continuing general or special transportation to the public and show that public transportation plays a significant role as it improves the quality of our day to day life by expediting traffic saves money and creates new jobs. In order to keep and attract more passengers, public transport must to have high service quality to satisfy and fulfill more wide range of different customer's needs (Anable, 2005).

Islam, Chowdhury, Sarker and Ahmed (2014) indicate that satisfaction in customers varies in line with the service dimensions which affect total satisfaction. More precisely, the results indicated that customers present a moderate to strong level of satisfaction along the line of service dimensions. The sub criteria “route safety”, “service of personnel”, “service inside the bus” comprises the strong points of the company. Carr (1986) provides six indicators that can be used in measuring the effectiveness of a public transportation system, and this includes financial control and keeping the integrity of the system, identifying changes needed for each service, maintaining and improving service quality, controlling sub-contractors among others.

Gatersleben and Uzzell (2007) also suggest that public transport is stressful due to unpredictability and longer travel times. This study also acknowledges some sources of pleasure for public transport users. Attributes relating to pleasurable feelings were as the possibility to read during the trip, to listen to music, to interact with other people, and to look at the passing scenery. Islam et. al. (2014) studied the customer satisfaction in public transport system using the following criteria: Services: Include the price of ticket, the service of personnel (behavior of bus driver), service inside the bus (comfort, cleanliness and air condition), service outside the bus (layout of bus stops) and route safety; Access: Consists of the access in bus stops and access in tickets; Availability: This means coverage of network, connectivity of lines, route frequency, route working hours, bus stop frequency; Time: This denotes route precise, route waiting time and route duration and Environment: This limits to bus aesthetics and bus pollution.

### 3. STATEMENT OF THE PROBLEM

In recent times all organization has increasingly come to understand the importance of customer satisfaction. It is widely understood that it is far less costly to keep existing customers than it is to wind new ones. For many organizations in the public sector, customer satisfaction will itself be the measure of success. It's unquestionable the importance of road transportation of passengers by bus for the development of a country. Associated with others transportation systems (air, rail and waterways), the road passenger transportation constitutes an important element in the transportation matrix (Freitas, 2013). The urban population in metro cities in India is facing many transportation problems like the infrastructure issues specifically in road transportation. There are many authorities which have been doing research in this particular area. The Transportation is one of the vital component of urban infrastructure and the lifeline of the city. A well-developed and planned transportation system accelerates economic growth. The ever-growing population of Delhi has resulted in mounting pressure on the transportation system and this is bound to increase further in coming years. The urban transportation system has to be developed to cater to the burgeoning population growth.

### 4. OBJECTIVES OF THE STUDY

This study proposes a framework to evaluate and identify significant factor affecting road users' satisfaction level. The specific objective are

- To study the satisfaction level of the various users of public transportation system and identify the most influencing determinants of satisfaction.
- To study the impact of gender and age on the level of satisfaction on public transportation system.

### 5. HYPOTHESES

The nature of this research was based on hypothesis testing to establish causal relationships between all variables. The hypotheses under this study are as follows.

H 1: There is no influence of gender on the users' satisfaction on public transportation system.

H 2: There is no influence of age group on the users' satisfaction on public transportation system.

H 3: There is no significant correlation between the factors that determines the consumers' satisfaction towards public transportation system.

### 6. METHODOLOGY USED

**Research Design:** Exploratory research is used to develop the research hypotheses. On the other hand, descriptive Research is used to describe customers' attitudes towards the public transportation system.

**Data Collection Method:** A well-structured questionnaire was developed and used for Primary data. Secondary data sources include academic literature and articles in different journals and magazines.

**Selection of Sample:** The sample customers chosen for the study are those who are using public transport system in Delhi – NCR region.

**Sample Size determination:** Method of comparison of similar studies is used to determine the sample size for his research work.

**Choice of Respondents:** Respondents were chosen using convenience sampling method to select the appropriate samples required for the study.

**Design of Questionnaire:** A 7-point Likert scale ranging from “Extremely satisfied = 7” to “Extremely dissatisfied = 1” was used to mark the satisfaction level on each of the 11 items.

**Sample Size:** Sample size of 200 was taken for this research and 192 responses were qualified for research.

**Statistical Tools Used:** Hypotheses were tested using Independent Sample Test (T-test), Coefficient of Correlation and ANOVA.

**7. DATA ANALYSIS AND INTERPRETATION**

In this sub-section data are analysed and the findings were extracted using appropriate statistical tools and consequent interpretations were made. To analyze the collected data on purchase intention, SPSS (ver. 21.0) was applied. All the data were considered at 95% of confidence level.

The attitudes of customers on the factors influencing their satisfaction level towards public transport system are measured on a 7-point Likert starting from “Extremely satisfied (7)” to “Strongly Dissatisfied (1)”. Descriptive Statistics such as mean and standard deviation were calculated and displayed in table 1. The analysis indicates that “Adequate service frequency” is the most preferred factor followed by “Proper network connection” and on the other hand “Staff service” is the least determining factor followed by “Comfort of waiting shed at the bus stops”.

**Table 1: Descriptive Statistics**

S. No.	Attributes	N	Mean	Std. Deviation
1.	Proper network connection (F1)	192	4.9531	1.38537
2.	Adequate service frequency (F2)	192	4.9792	1.45781
3.	Convenient time schedule (F3)	192	4.7969	1.30460
4.	Safety measures from accidents (F4)	192	4.4583	1.52753
5.	Cleanliness of the vehicle (F5)	192	4.3229	1.69998
6.	Staff service (F6)	192	3.7917	1.43565
7.	Comfort of waiting shed at the bus stops (F7)	192	4.0104	1.59183
8.	Ticket price as compared to other modes of transportation (F8)	192	4.5156	1.43981
9.	Not being overcrowded (F9)	192	4.7865	1.57906
10.	Travel time to cover the distance you travel (F10)	192	4.5885	1.66971
11.	Ease of getting on and off the bus (F11)	192	4.0208	1.89228

Table 2 indicates the analysis of independent sample t-test in determining the influence of gender on the consumers’ satisfaction towards public transportation system. Male customers have shown more conscious on Proper network connection than their counter parts. The t-value for Staff service indicates significant difference at level  $p \leq 0.05$ . It means that satisfaction level between male and female customers of public transport system are significantly different

in Staff service. However, even though mean scores of male respondents’ attitude are slightly different from that of their female counterpart, it is found that gender does not have any significant impact on other factors.

**Table 2: Impact of Gender on Customer Satisfaction**

Fact ors	t-test for Equality of Means					
	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
F1	1.274	0.204	0.25494	0.20017	-0.1399	0.64978
F2	0.481	0.631	0.10167	0.2114	-0.31533	0.51867
F3	1.568	0.119	0.29486	0.18809	-0.07615	0.66587
F4	0.209	0.835	0.04625	0.22162	-0.39091	0.48341
F5	0.022	0.982	0.00545	0.24667	-0.48111	0.49202
F6	2.089	<b>0.038</b>	0.43024	0.20597	0.02397	0.83651
F7	-0.538	0.591	-0.12414	0.2308	-0.57941	0.33113
F8	-1.095	0.275	-0.2281	0.20826	-0.63891	0.18271
F9	1.193	0.234	0.27239	0.22827	-0.17788	0.72266
F10	-0.206	0.837	-0.04985	0.24225	-0.5277	0.428
F11	-0.6	0.549	-0.1645	0.27432	-0.7056	0.37659

The demographic characteristic Age was categorized into four such as less than 15 to 25yrs, 25 to 35 yrs, 35 to 45 yrs, 45 to 55 yrs, 55 to 65 yrs and 65 or over. The impact of age on the factors influencing the satisfaction level towards public transport system is analysed here using one way - ANOVA. Table 3 indicates the analysis of one way - ANOVA in determining the influence of age on the customer satisfaction level towards public transport system. As shown in table, the significance level  $p < 0.05$ , Proper network connection, Adequate service frequency, Convenient time schedule, Safety measures from accidents, Cleanliness of the vehicle and Staff service. It indicates that null hypothesis can be rejected and alternate hypothesis is substantiated. It means that age has significance impact on these factors influencing the satisfaction level towards public transport system and age does not have any significant impact on other factors.

**Table 3: Impact of Age on Customer Satisfaction**

Factors		Sum of Squares	df	F	Sig.
F1	Between Groups	56.146	4	8.455	<b>0.000</b>
	Within Groups	310.432	187		
	Total	366.578	191		
F2	Between Groups	20.359	4	2.469	<b>0.046</b>
	Within Groups	385.558	187		
	Total	405.917	191		
F3	Between Groups	41.387	4	6.82	<b>0.000</b>
	Within Groups	283.691	187		
	Total	325.078	191		
F4	Between Groups	27.999	4	3.134	<b>0.016</b>
	Within Groups	417.668	187		
	Total	445.667	191		

<b>F5</b>	Between Groups	50.148	4	4.672	<b>0.001</b>
	Within Groups	501.831	187		
	Total	551.979	191		
<b>F6</b>	Between Groups	40.925	4	5.424	<b>0.000</b>
	Within Groups	352.742	187		
	Total	393.667	191		
<b>F7</b>	Between Groups	3.207	4	0.312	0.870
	Within Groups	480.772	187		
	Total	483.979	191		
<b>F8</b>	Between Groups	1.990	4	0.236	0.918
	Within Groups	393.963	187		
	Total	395.953	191		
<b>F9</b>	Between Groups	14.535	4	1.472	0.212
	Within Groups	461.710	187		
	Total	476.245	191		
<b>F10</b>	Between Groups	6.841	4	0.608	0.657
	Within Groups	525.654	187		
	Total	532.495	191		
<b>F11</b>	Between Groups	13.435	4	0.937	0.444
	Within Groups	670.482	187		
	Total	683.917	191		

The hypothesis that there is no significant correlation between the factors that determines the consumers’ satisfaction towards public transport system is tested here. Table 4 shows the correlation coefficients between all factors influencing user satisfaction. It is found that “Ease of getting on and off the bus” and “Travel time to cover the distance you travel” have significant correlation with almost all factors. From the table it is found that majority of factors have significant positive correlation with each other.

**Table 4: Correlation Analysis**

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
F1	1.000										
F2	.419**	1.000									
F3	.829**	.394**	1.000								
F4	.757**	.136	.756**	1.000							
F5	.800**	.334**	.825**	.842**	1.000						
F6	.656**	.248**	.763**	.481**	.579**	1.000					
F7	.131	-.081	.208**	.289**	.299**	.324**	1.000				
F8	.122	.028	.025	.201**	.133	.014	.057	1.000			
F9	-.029	-.193**	-.086	.091	.014	.237**	.376**	-.018	1.000		
F10	.385**	.274**	.483**	.481**	.493**	.412**	.258**	.357**	.084	1.000	
F11	.214**	-.169*	.343**	.276**	.260**	.665**	.620**	.075	.494**	.294**	1.000

**8. CONCLUSION**

Public transportation comprises all transport facilities in which passengers do not use their personal means of transportation to travel. It is one of the most important ways of transportation as it covers most areas and modes. The escalating urban population of India is engaging in a variety of financially viable activities in rapidly expanding cities, which are, therefore, encountering fast escalations in urban travel demand. A variety of transport modes, such as, walking, cycling, two-wheelers, para-transit, public transport, cars, etc. are used to meet these travel need. Travel demand and the satisfaction of road users particularly the users of public transport system are determined by a number of factors. Public transport should become part of a solution for sustainable transport in the future. However, in order to keep and attract more passengers, public transport must to have high service quality to satisfy and fulfill more wide range of different customer’s needs. region develops a long term transportation blueprint for Bus services for any further progress in transportation ventures.

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