



Assessing customer experience in urban public transport in Delhi NCR

Prachi Peter¹, Dr. Kavita Indapurkar²

Student, Amity School of Economics ,Amity University, Noida¹

Professor Amity School of Economics ,Amity University, Noida²

Received: 10 April Revised: 18 April Accepted: 26 April

Abstract

The growing urbanisation trend in the urban areas attributes to day to day life supporting systems .Transport sector plays a vital role in the development of a country . It affects the living standards of economic and social strata of life. The main focus of this study is fourfold. First, To analyse about the preferences for urban public transport by the commuters in Delhi NCR .Second ,to identify the problems faced by the daily users of urban public transport in Delhi NCR. Third ,to assess the level of satisfaction of various additional services claimed by users of urban transport in Delhi NCR. And finally to study the safety and security level of commuters in urban public transport in Delhi NCR. . The study was based on primary data based on 4 point likert scale collected from 370 respondents out of which 184 were males and 186 were females. The multiple regression technique was used to analyse the impact of preferences , problems, additional services and security issues on overall customer satisfaction from which the results shown a significant impact on commuters overall satisfaction. The stringent measures should be taken to deal with the erring drivers in case of violation of traffic rules such as rash driving ,misbehaviour with the commuters and the staff members.

Keywords: Urban Public Transport, commuters satisfaction, commuters preferences, commuters problems ,additional services, safety.

I. Introduction

Presently out of the total Indian population, approximately 30 % are residing in urban metro cities due to progressive urbanisation , and the urge to live a better quality life which as a result are posing serious threat to our environment .The growing urbanisation trend in the urban areas attributes to day to day life supporting systems (G.Botzoris,2015) .Foremost public transport is of utmost importance which caters to accessibility for achievement of urban people for all practical purposes (M.A. Javid,2013). For sustainable transport facilities there is a dire need of risk free and environmental friendly approach for daily commuters in the urban populated areas . Hence, transport sector plays a vital role in the development of a country . It affects the living standards of economic and social strata of life. Transport infrastructure is needed to be assessed in the context of education, health and employment etc. There is a huge scope for provision of potential market relating to transportation services (R.Imam,2014).



In the present scenario, as the economy is more engaged in performing economic activities the commuting needs of the growing population has increased accordingly in the developing countries. Perhaps, this phenomenon seems to be quite evident everywhere in big cities in Asia, which is particularly due to modern transport mechanization and motorisation prevalence as well. Thus, resulting in fulfilling requisite transport related needs, which further leads to sustainable and environmental friendly transport systems (S.Sanjay,2016). Therefore, main focus is laid on reducing greenhouse gas emissions at the national and the international level, so that all the sections of the society i.e., young, old, physically challenged person and women can enjoy the safer, cheaper and reliable public transport (M. Friman,2009). Due to ineffective and poor public transport facilities and the dominion of the privately owned transport systems resulted in improper transport facilities.

As in the case of Delhi, it attributed to the increase in incidents of accidents and persistently growing pollution affecting commuters and non commuters of the prevalent systems of transport. Delhi transport corporation which plies around 6 thousand buses and facilitates almost 4 million daily commuters to reach their destinations was incorporated in May 1948. The fares are being charged nominally in the non ac buses whereas ac buses are also available at reasonable prices based on the respective variable distances starting from 5 km upto long distance journey. Delhi metro rail corporation (DMRC) proposed the metro service plan on May 3rd, 1995 and commenced from December 24th, 2002 having its headquarters at Barakhamba Road, New Delhi. Initially the metro was started operating with 6 coaches only but now it has increased to 8 for the convenience of the masses which comprises of one women coach. For the convenience of masses commuting daily has been improvised by way of introducing Metro services in 8 different lines i.e. a) Red line, b) Violet line, c) Yellow line, d) Blue line, e) Green line, f) Pink line, g) Magenta line and h) Airport express line which plies from a) Dilshad Garden/Ghaziabad to Rithala, b) Escorts Mujesar/Faridabad to Kashmere Gate, c) Huda city centre to Samaypur badli, d) Noida/Vaishali to Dwarka sector 21, e) Mundka /Bahadurgarh to Inderlok/Kirti nagar, f) Majlis park to Shiv vihar, g) Botanical garden to Janakpuri west, h) New Delhi to IGI airport respectively. Metro Feeder bus service are also provided from to and fro metro stations to the desired destinations. To enhance the convenient transportation travelling a joint ticket system facility is introduced to be used simultaneously in Metro rail and DTC buses. Due consideration is also given to the physically disabled persons by way of providing elevators and personal attendants besides reserving seats for handicaps in each coaches. Timely alerts for the arrival of the scheduled trains are conveyed frequently with the given halting time as well. For the daily commuters smart card facility and rarely commuting operators the one time token is being provided for facilitating the metro travelling. Recently, the Government of India launched an environment friendly scheme called Green Urban Transport Scheme (GUTS) has projected the expenditure of Rs. 25,000 crores. In order to mitigate the harmful carbon emissions the strategy was formulated featured with Intelligent Transport System (ITS) and Free WIFI (Ministry of Housing and Urban Affairs,2016).

It has been assessed by the various researchers that due concern has been provided to improve the price level, demand, traffic congestion related problems and difficulties related to environmental ill effects, etc., but the daily urban public transport commuter's overall satisfaction were left unattended especially in Delhi NCR. In order to transform the negative public opinion about the public transport and attract towards urban public transport as compared to using private vehicles



and motivate the existing daily commuters to opt for public transport facilities. As a result, the study about the preferences for urban public transport by the commuters, the problems faced by the daily users, satisfaction level of various additional services (online top up recharge, provision of helpline no., CCTV cameras, etc.) claimed by users and commuters satisfaction level related to seat availability, prices, cleanliness, travel time etc., of urban transport in Delhi NCR are taken into due consideration.

Literature review

Drea (1998) and Hanna (2000) emphasized focus on improvement of factors influencing efficient service quality of urban public transport. He identified that the comfortability, cost effectiveness, and mobility to the desired destination were the main factors responsible for the commuters preferences towards urban public transport while at the lateral stage he examined the provision of seat availability, cleanliness and parking slots for influencing commuters towards urban public transport.

Beirão and Sarsfield Cabral (2007) revealed that public transport is much better than private vehicle users in terms of convenience, prices, travelling time, safety, pollution, traffic and reliability and plays a pivotal role in attracting the commuters towards urban public transport.

Silcock (1981), Pullen (1993) and Friman (2001) studied that the commuters of the urban public transport are inclined towards quality oriented preferences such as punctuality, frequency of short time intervals of trips, announcement of arrivals.

Randheer (2011) indicated that availability of services should be timely and less stressful. At the same time, due preference should be given to business class so as to enable them to facilitate luggage transit.

Sevanatha (2002) explored several problems relating to service quality of urban public transport such as crowdedness at peak hours, inefficient arrival and departure time schedules, irregularities of bus service, non connectivity of bus service destinations from the local residential complexes, non availability of short distance public transport, etc. The main focus was on improvement of standard of living in the absence of quality urban public transport services.

Kumarage (2004), Dhingra (2011) identified that due to increase in population the quality service of urban public transport is mitigating day by day resulting in disinterest for travelling in public transport and preferring to commute by private vehicles only. They have also analysed that state authorities are least interested to improve upon the services of public transport for urban commuters.

Chao Sun (2018) analysed the commuters walking distance and time to reach the stations and other factors such as accessibility and reliability of the urban public transport and suggested to increase the number of vehicles in order to attract more commuters towards urban public transport.



i. Objectives

1. To analyse about the preferences for urban public transport by the commuters in Delhi NCR.
2. To identify the problems faced by the daily users of urban public transport in Delhi NCR.
3. To assess the level of satisfaction of various additional services claimed by users of urban transport in Delhi NCR.
4. To study the safety and security measures of commuters in urban public transport in Delhi NCR.
- 5.

ii. RESEARCH METHODOLOGY

The study is subjected to analyse the commuters preferences ,to identify the problems faced by the daily users , to assess the level of satisfaction of various additional services claimed by users and to study the security level of commuters in urban transport in Delhi NCR. The study was based on primary data based on 4 point likert scale collected from 370 respondents out of which 184 were males and 186 were females . The analysis is subjected to CRONBACH alpha to test the reliability of the factors impacting customer satisfaction towards urban public transport .The factor analysis is used to provide reduction to the data set due to which 4 factors were extracted to assess the customer's satisfaction towards urban public transport. The multiple regression analysis was used to assess the impact of customer preferences , additional services , problems, security and safety level on overall commuters satisfaction while travelling in urban public transport. The model of the multiple regression technique is explained as under :-

Model specification

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \dots\dots\dots\text{Model}$$

Y- Overall consumer satisfaction

β_0 -Intercept

X1-Consumer Preferences

X2-Consumer problems

X3-Additional services

ε -Error term

Hypothesis

- H_{01} :Consumer Preferences has no impact on overall commuter satisfaction towards urban public transport.
- H_{02} :Problems has no impact on overall commuter satisfaction towards urban public transport.
- H_{03} :Additional services has no impact on overall commuter satisfaction towards urban public transport .
- H_{04} :Safety and security has no impact on overall commuter satisfaction towards urban public transport .



II. Data analysis

In the study the factors for stimulating the overall satisfaction are the preferences ,satisfaction of additional services, commuters problems and safety issues while travelling in urban public transport in Delhi NCR .The study was based on primary data to analyse about the preferences for urban public transport by the commuters, to identify the problems faced by the daily users, to assess the level of satisfaction of various additional services claimed by users and safety and security level in urban transport in Delhi NCR.

Table 1.Demographic Characteristics of Respondents in Delhi NCR (N=370)

Variables	Characteristics	Frequency	Percentage
Age	15-19	36	9.7
	20-29	133	35.9
	30-39	69	18.6
	40-49	75	20.3
	50-59	47	12.7
	60-69	10	2.7
Gender	Male	184	49.6
	Female	186	50.4
Occupation	Student	143	38.6
	Business	37	10
	Job Seeker	143	38.6
	Housewife	26	7
	Retired	16	4.3
Annual Income	Less than 1 lakh	142	38.4
	1-6 lakhs	50	13.5
	7-12 lakhs	58	15.7
	More than 12 lakhs	107	28.9
Total		370	100

Source: Authors own compilation



It is inferred from the given table that 35.9% of the commuters were confined to young people of age group 20-29 which travels more in urban public transport as compared to only 2.7 % of old aged people (60-69) in Delhi NCR .The study also revealed that 50.4% were female commuters as compared to 49.6 % of the male commuters travelling in urban public transport in Delhi NCR. The students and the job seekers comprises the largest part of the commuters i.e 38.6% who travels more in urban public transport in Delhi NCR as compared to 7% of the housewife category and 4.3 % of the retired category .The above table also revealed that 38.4 % of the commuters were confined to the annual income less than 1 lakh as compared to the commuters having annual income more than 12 lakhs.

Table 2. Distribution, mean and standard deviation values of respondents in Delhi NCR

Variables	Strongly agree	Agree	Disagree	Strongly Disagree	Mean	Standard Deviation
Availability of seats	40	80	120	130	4.7	0.869
Prices	150	180	30	10	4.8	0.865
Cleanliness	10	20	150	190	3.7	0.597
Travel time	280	50	35	5	2.1	0.711
Punctuality	123	50	174	23	3.9	0.885
Air conditioned	179	149	30	12	2.2	0.712
Reserved seat for female	153	147	40	30	4.1	0.821
Online top up recharge	210	80	60	20	4.8	0.849
Wifi	9	10	94	257	4.2	0.791
Ineffective helpline no.	163	200	4	3	2.0	0.691
Elevator/lift	179	150	23	18	2.4	0.725
Insufficient CCTV cameras	187	154	19	10	3.2	0.794
Crowdedness	179	126	35	30	2.7	0.675
Waiting time	30	48	125	167	3.7	0.807
Improper baggage Area	57	33	127	153	2.8	0.711
Drinking Water problem	248	72	35	15	2.4	0.654
Non availability of Rest rooms						
First Aid problem	276	92	1	1	2.6	0.687
Insufficient misbehaviour of staff members	157	198	13	2	2.9	0.699
Ineffective/poor complaint redressal	68	55	183	64	3.9	0.797
Eve teasing incidence	51	47	168	104	3.2	0.812
Bad Boarding Experiences	310	51	5	4	4.6	0.834
	65	89	194	22	4.3	0.822

Source: Authors own compilation



In the above given table ,the mean values and standard deviation are depicted for the overall commuters satisfaction towards urban public transport. The table shows that 130 respondents strongly disagreed about the availability if seats in buses and metros with a mean of 4.7 and standard deviation of 0.869.The mean and standard deviation values are 4.8 and 0.865 respectively for influencing customer satisfaction where 150 respondents strongly agreed and 10 respondents strongly disagreed with the fare prices .The majority of the commuters i.e. 190 respondents strongly disagreed with the cleanliness with mean 3.7 and standard deviation 0.597.As it can be seen from the table that 310 respondents strongly agreed about facing the eve teasing problems while travelling in urban public transport with mean of 4.6 and standard deviation of 0.834.The commuters claiming the online top up recharge facility are 210 respondents who strongly agreed with mean of 4.8 and standard deviation of 0.849 . The majority of the commuters i.e. 187 respondents strongly agreed with the insufficient availability of CCTV cameras with mean 3.2 and standard deviation 0.794.

Extraction Method: Principal Component Analysis

Source: Authors own compilation

As the given table indicates the eigenvalues for the extracted factors , variance percentage and cumulative percentage . The analysis depicts the four principal components factor solution with eigenvalues more than 1 representing variance of 70.976 %.

Table 3.Rotated component matrix grouping commuters overall satisfaction in Delhi NCR

Attribute	Factor			
	1	2	3	4
Eve teasing				0.805
Ineffective Helpline number				0.875
Insufficient /Ineffective CCTV cameras				0.849
Air conditioned			0.543	
Cleanliness			0.698	
Reserved seat for female			0.821	
Online top up recharge			0.835	



Wifi			0.553	
Elevator/lift			0.724	
Crowdedness		0.837		
Waiting Time		0.525		
Improper Baggage area		0.486		
Misbehavior of Staff Members		0.576		
Ineffective/poor Complaint Redressal		0.528		
Bad Boarding Experience		0.605		
Drinking Water problems		0.737		
Non availability of Rest Rooms		0.790		
First Aid problem		0.688		
Insufficient Lift/Elevator		0.586		
Availability of seats	0.836			
Prices	0.796			
Punctuality	0.627			
Travel time	0.721			

Source: Authors own compilation

As shown in the table the factors are extracted through factor analysis based on the principal component analysis with VARIMAX rotation to obtain the factor scores . It can be seen from the table that 1st factor considers the commuters preference towards urban public transport i.e. , availability of seats, prices, punctuality and travel time .The second factor considers commuters facing problem in



urban public transport i.e. , crowdedness ,waiting time, improper baggage area, misbehaviour of staff members,ineffective/poor complaint redressal, bad boarding experience ,drinking water problem, non availability of rest rooms , first aid problems and insuffice lift/ elevator. The third factor comprises of commuters claims of additional services i.e. , air conditioned, cleanliness, reserved seat for female ,online top up recharge ,WIFI, and elevator/lift. The fourth factor summarizes the commuters security i.e. , eve teasing, ineffective helpline number and CCTV cameras.

Table 4.Reliability Analysis for preferences, claim of additional services, problems faced and security level of commuters travelling in urban public transport in Delhi NCR

CRONBACH Alpha

Factors	variables	CRONBACH Alpha
Commuters preferences towards urban public transport	availability of seats, prices, punctuality and travel time	0.815
Commuters facing Problems in urban public transport	crowdedness ,waiting time, improper baggage area, misbehavior of staff members, ineffective/poor complaint redressal, bad boarding experience ,drinking water problem, non availability of rest rooms , first aid problems and insuffice lift/ elevator.	0.875
Commuters claims of Additional services	air conditioned, cleanliness, reserved seat for female ,online top up recharge ,WIFI, and elevator/lift.	0.743
Commuters Security in Urban public transport	Eve teasing , ineffective helpline number and CCTV cameras.	0.836

Source: Authors own compilation

To test the reliability of the study CRONBACH alpha analysis is undertaken ,where the standard value is 0.70 . In the study , the obtained values are higher than the standard value representing that the test is valid and reliable to study in the future. As it can be seen from the table that alpha values for the commuters preferences, commuters problem , commuters claim of additional services and commuters security represents the high reliability and high internal consistency i.e. more than 0.70 as the cronbach alpha values ranges from 0 to 1 ,the higher the alpha coefficient , the more reliability



is depicted. From the analysis all the four factors are more than 0.74 showing high reliability of the study .

Table 5. Regression Analysis for impact of commuters preferences, claim of additional services, problems faced and security level on overall commuters satisfaction in urban public transport in Delhi NCR

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
(Constant)	0.668	0.076			0.153
Commuters Preferences	0.825	0.016	0.173	0.575	0.004
Commuters Claims of Additional Services	0.746	0.168	0.104	0.632	0.006
Problems Faced by Commuters	- 0.857	0.018	0.179	0.583	0.002
Commuters Safety	0.624	0.026	0.486	0.367	0.005
R square	0.637				
Adjusted R Square	0.736				
Significance	0.000				

Source: Authors own compilation

The values of various respective coefficients are given in the following equation as per the methodology :-

$$\text{Commuters satisfaction} = 0.668 + 0.825 X_1 + 0.746 X_2 - 0.857 X_3 + 0.624 X_4 + \epsilon$$



From the above equation it is inferred that :-

- In the model ,lower p value i.e. if the obtained value is less than the standard value (0.05),then the changes in the predictor is statistically associated with the changes in the responses .The p value for commuters preferences is 0.004 ($\beta_1=0.825$)which means it has positive impact on Commuters overall satisfaction and the coefficient is found significant. From the study, it has been inferred that ,commuters preferences has an impact on commuters overall satisfaction towards travelling in urban public transport, as a unit increase in commuters preferences causes 82.5% increase in overall commuters satisfaction in urban public transport in Delhi NCR, therefore the null hypothesis(H_{01}) has not been accepted .
- In the model ,lower p value i.e. if the obtained value is less than the standard value (0.05),then the changes in the predictor is statistically associated with the changes in the responses .The p value for commuters claims for additional services is 0.006 ($\beta_2=0.746$)which means it has positive impact on commuters overall satisfaction and the coefficient is found significant. From the study, it has been inferred that ,commuters claims for additional services has an impact on commuters overall satisfaction towards travelling in urban public transport as a unit increase in commuters claims for additional services causes 74.6 % increase in overall commuters satisfaction in urban public transport in Delhi NCR, therefore the null hypothesis(H_{02}) has not been accepted .
- In the model ,lower p value i.e. if the obtained value is less than the standard value (0.05),then the changes in the predictor is statistically associated with the changes in the responses .The p value for the problems faced by the commuters is 0.002 ($\beta_3= -0.857$)which means it has a negative impact on commuters overall satisfaction and the coefficient is found significant. From the study, it has been inferred that ,the problems faced by the commuters has an impact on commuters overall satisfaction towards travelling in urban public transport as a unit increase in commuters problems causes 85.7% decrease in overall commuters satisfaction in urban public transport in Delhi NCR, therefore the null hypothesis(H_{03}) has not been accepted.
- In the model ,lower p value i.e. if the obtained value is less than the standard value (0.05),then the changes in the predictor is statistically associated with the changes in the responses .The p value for commuters security in urban public transport is 0.005 ($\beta_4=0.624$) which means it has positive impact on Commuters overall satisfaction and the coefficient is found significant. From the study, it has been inferred that ,commuters security has an impact on commuters overall satisfaction towards travelling in urban public transport as a unit increase in commuters security causes 62.4 % increase in overall commuters satisfaction in urban public transport in Delhi NCR, therefore the null hypothesis(H_{04}) has not been accepted .

III. Major Findings and Conclusion

The study signified that customer preferences, claim of additional services, travelling related problems and safety issues have a significant impact on customers overall satisfaction. It has been observed that the daily commuters are dissatisfied with the available facilities provided by urban public transport services .The study signifies that the preferences, common problems faced by commuters , claims of additional services and safety issues are the main factors for analyzing the impact on overall commuters satisfaction. To conclude with, the



findings indicated that availability of seats, prices, punctuality, travel time, safety, reserved seat for female and online top up recharge are the prevalent crucial factors affecting overall commuters satisfaction and plays a crucial role in order to retain the existing commuters and attract private vehicle users to avail public transport services.

- The findings revealed that customers tend to avail best possible seat availability, reasonable prices, short travel time and hygienic conditions to be made accessible at all times.
- The major problems faced by the daily commuters while travelling in urban public transport are concerning fully equipped first aid facilities, clean drinking water, insufficient/non-operational lifts and elevators, crowdedness and improper/lack of baggage area.
- The study revealed that the additional services available to the commuters while commuting in bus and metros are online top up recharge, reserved seats for female, air conditioned transport services, and elevators/lifts.
- The commuters are coming across the growing menace of eve teasing, pick pocketing, purse and mobile snatching incidences. Also, due to insufficient CCTV cameras, helpline numbers and police patrolling failing which culprits are unable to be apprehended.
- The commuters tend to prefer travelling by urban public transport due to financial constraints.
- The study revealed that due to lack of sufficient number of public transport vehicles there is heavy traffic jams during peak hours which commuters find inconvenient to reach their destinations on time during working days.

IV. Suggestions

- CCTV cameras must be installed in all bus and metro stations in order to provide on and off board security of the commuters. Helpline numbers should be operational at the time of emergency, if any. Setting up of police booths near the bus and metro stations should be made mandatory to protect the public from incidences of pick pocketing and eve teasing.
- The due cognizance should be given to the fully trained drivers while appointing them in buses and metros. The stringent measures should be taken to deal with the erring drivers in case of violation of traffic rules such as rash driving, misbehaviour with the commuters and the staff members.
- At the bus stops intermittent announcements about the arrival and departure of buses and its frequency should be provided and the provision of ticket vending machines should be made available in all the bus stations in the same manner as being practised in all the metro stations.
- Electronic traffic signal control should be made operational instead of manual control by traffic police at the traffic signals/intersections.
- The number of vehicles should be considerably increased in order to avoid the public rush at the bus stands and metro stations throughout the day and not just during peak hours.
- The seat availability should be taken into due consideration in order to retain the existing commuters and attract more commuters to switch over from private vehicles users to public transport.



- The fair prices charged by the commuters should be effectively monitored in order to avoid the misappropriation of the commuters money.
- The prevalent approaching roads which plies the buses should be widened, repaired and maintained in an effective manner from time to time to avoid accidents during rainy season due to pot holes.
- The traffic congestion has become a menace to most public bus operators which should be regulated by following traffic rules as directed by posted traffic police on the roads.
- There should be expansion of approaching roads by the collaboration of Corporation and Transport Authorities since the commuters have to really walk long miles to reach the bus stands .
- The proper first aid facilities and complaint register and its redressal should be made available in the buses and metros.
- Last but not the least due consideration should also be given towards motivating the public transport crew members by way of providing incentives and festive gifts to make them feel worthy for the services rendered by them irrespective of hard climatic conditions and making public awareness to give due respect to them as they are indispensable .
- The due emphasis should be given on providing free WIFI facilities in urban public transport.

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International journal of basic and applied research

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ISSN 2249-3352 (P) 2278-0505 (E)

Cosmos Impact Factor-5.960

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