Performance Improvement of Existing Mass Transportation System -A Case Study on Surat City

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Abstract— **Transportation is an indispensable service to link spatially separated activities and is a strategic element, which can determine the pattern and success of regional development. A great majority of people in developing countries is unable to maintain personal transport; hence there is growing emphasis on providing public transport services. In this research topic provide strengthening and improving existing mass transportation system in Surat city. Surat city buses have existing 31 routes to perform. Methodology used in this paper boarding-alighting survey and public opinion survey. Results show that various remark give by commuters to improve the quality of buses, safety, travel time, cleanliness, frequency, comfort, ease of transfers etc.**

Index Terms- **Mass transportation, City bus, public transportation**

I. INTRODUCTION

An increase in population generates increasing in travel demand. India as one of the most populated countries in the world faces a large number of travel demand. An increased road length and new roads generate faster and longer trips, more trips by car and higher car ownership all of which adds up to more traffic congestion and pollution.

The importance of transportation in the world development is multidimensional. It links residence with employment, good producer with the users. It also provides opinion for work, shopping, recreation, health, education, and other amenities. Urban transportation infrastructure is looking up as transport demand in most Indian cities. It has increased due to increase in population as a result of migration from rural areas and smaller towns to cities. Transport in India has to be an integrated and diverse system with multiple modes of transport – buses, metro, rail, private transport systems.

Rapid growth in vehicles population has put enormous strains in all urban roads in all million plus cities in India, due to high vehicle ownership and poor supporting public transport facilities specially in the cities where the population is between 1 to 2 million. The major factor is very low ridership in public transport due to poor service quality and more travelling time

Objective of Study

- To carry out study of existing transportation facility.
- To evaluate the existing transportation facility in terms of efficiency, cost and safety.
- To propose the remedial measures to improve the performance of the existing system.
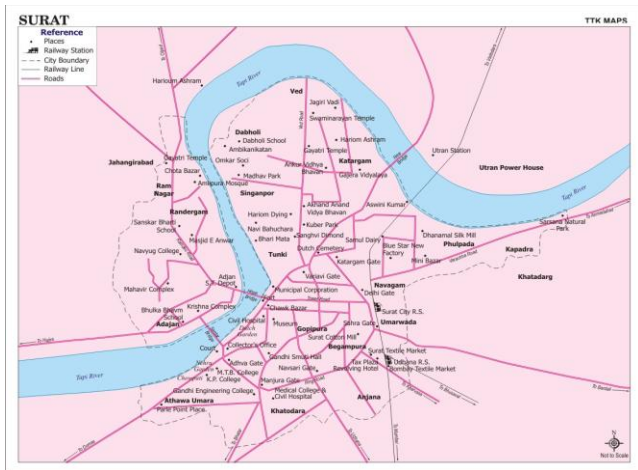
II. STUDY AREA

Study area to be select as fort city of Surat. The area of radial circle road network of railway station-sahara darvaja-majuragate-athwagate-chawk bazaar road-railway station(delhi gate) to be select for survey. All other small internally road network of study area also be include in survey.

City Bus Service System has got approved from government of Gujarat with PPP model. Overall monitoring has been done by the Surat Municipal Corporation. In this model, private investment has came in buses, operation of buses and decision with reference to tariff; Routes and frequency of buses has been decided by the SMC.

Privatisation is to aim at relieving the financial and administrative burden of the government undertaking and maintaining a vast and constantly expanding network of city bus services.The city bus service of Surat is being run by SMC in public private partnership.

Figure 1.Study Area Surat City

It is having a fleet of **125 buses**, which are operating on **31 routes**.List of routes given below:

Table 1. Route Chart

SR. NO	BUS ROUTE	ROUTE NO.	LENGTH (K.M.)
1.	STATION – UNIVERSITY	1	10
2.	STATION – BHARTHANA	2	12
3.	STATION – PITHAWALA COLLAGE	7	13
4.	STATION – VARIVAV JAKATNAKA	21	11
5.	STATION – KADODARA	22	19
6.	STATION - MTB CHOPATI	25	7.3
7.	STATION - SACHIN STATION	33	24
8.	STATION – DUMMAS	44	20
9.	STATION - NEW RANDER	50	7
10.	STATION – OLPAD	55	22
11.	STATION - AAS PASS	66	6.8
12.	STATION - UTRAN POWER HOUSE	75	6.2
13.	STATION – RUNDHNAKA	77	10
14.	CHOWK – MOTIVED	80	7.4
15.	MTB – AMROLI	88	6
16.	STATION – PUNAGAM	100	5
17.	STATION - SARTHANA JAKATNAKA	111	9.5
18.	STATION- PANDESARA	121	9.9
19.	STATION – SAYAN	200	16
20.	STATION – CHALTHAN	222	16
21.	STATION – HAJIRA	300	11
22.	DANDI – VALUK	400	22
23.	STATION – MORA	444	6.3
24.	STATION -GAS CIRCLE	500	6.1
25.	STATION - PALANPUR JAKATNAKA	555	8
26.	STATION – CHAPRABHATHA	600	6.5
27.	STATION - DINDOLI VILLAGE	666	11
28.	STATION – OGAT	700	9.2
29.	STATION – RANDER	777	7.4
30.	STATION - NEW CITYLIGHT	800	9.8
31.	STATION – KOSAD	888	7.5

III. DATA COLLECTION AND ANALYSIS

The methodology adopted for this paper was identification of key issues, data collection, data interpretation to analyze the specific issues and finally suggesting the solutions.

Primary data has been used to collect the views and opinions of different stakeholders involved and collected with the help of questionnaire prepared by the researcher. Collection of secondary data from the various departments is also important in this work. The independent variable used in this study is overall satisfaction with Public Transit service. Dependent variables is specific service quality attributes which consist of public bus transit departure frequency, travel time, price, information, cleanliness, staff behavior, bus comfort, seat availability, bus stop security, safe from accident, on board security, bus stop condition etc.

The basic surveys carried out are namely:

- Existing public transport passengers survey (boarding – alighting)
- Questionnaire survey (public opinion)

(A) **Existing public transport passengers survey (boarding – alighting)**

Boarding alighting surveys measure the number of persons getting on and off of a bus at each bus stop. This is an on-board survey which requires the observer to be seated within the bus; one observer for each door in the bus. The observer records the number of passengers that have boarded and alighted at each stop along with the time of arrival at each stop. This survey can be used for:

- Determining the load profile of a trip
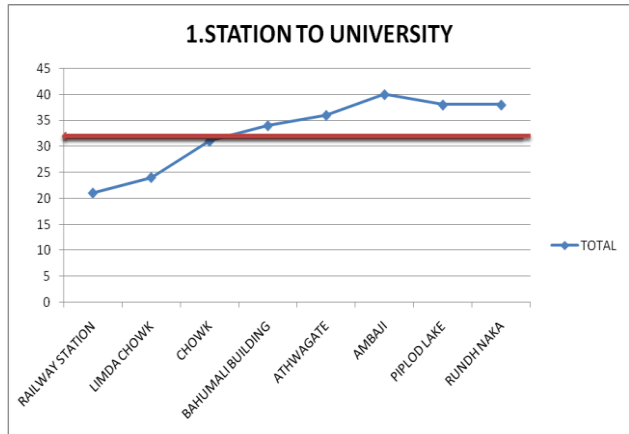- Identifying the main activity centres along the route on which the bus plies.

Boarding - alighting survey carried out by researcher taking all 31 routes of city bus during pick hours morning and evening. In the data collection sheet data of

passengers that have boarded and alighted at each stop and total number of passengers present that time in buses.

All 1 to 31 routes of buses data analysis are shown as graph chart. Bus capacity is **32 sheets.** In the graph chart rate of flow passenger is display. All routes data collection and analysis chart given below in details.

Table 2.Sample Of Data Collection For Route No.1 Station To University

1.STATION TO UNIVERSITY					
route no. 1 (MORNING)					
ST OP	STOP NAME	TIM E	Boardi ng Passen gers	Alighti ng Passen gers	TOTA L
1	STATI ON	9.24 am to 9.53 am	21	0	21
2	LIMD A CHOW K		5	2	24
3	CHOW K		8	1	31
4	BAHU MALI BUILD ING		6	3	34
5	ATHW AGAT E		7	5	36
6	AMBA JI		6	2	40
7	PIPLO D LAKE		2	4	38
8	RUND H NAKA		0	38	38

Figure 2.Analysis Graph For Route No 1.

Analysis results show that route no.1, 22, 33, 55, 77, 200, 222, 666, 700 are highly overcrowded and more passengers flow during pick hours.

(B) Questionnaire survey (public opinion survey)

The user of the bus service is the commuter and understanding the view of the passenger is an important input to improving service quality in any transit system. For the purpose of understanding travel behaviour and user preferences, passenger interviews or opinion surveys are conducted.

In this survey researcher get opinion of various kind criteria related bus travel. Such example that bus frequency, comfort, travel time, ease of transfers, cleanliness, safety, information system, overall quality of bus etc.

Sample size: 1000.

Figure 3.Researcher Taking Questionnaire Survey.

Figure 4.Analysis Chart of Travel Time, Frequency And Comfort
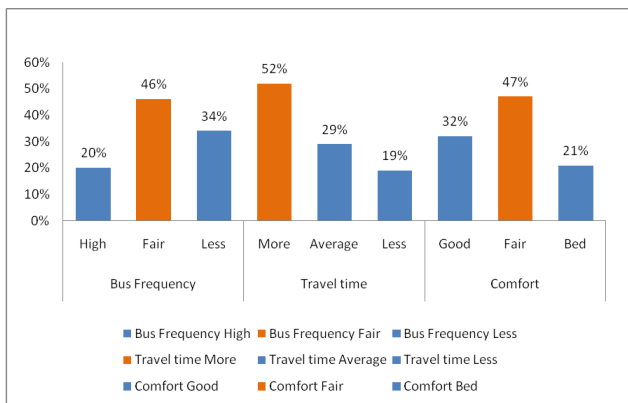

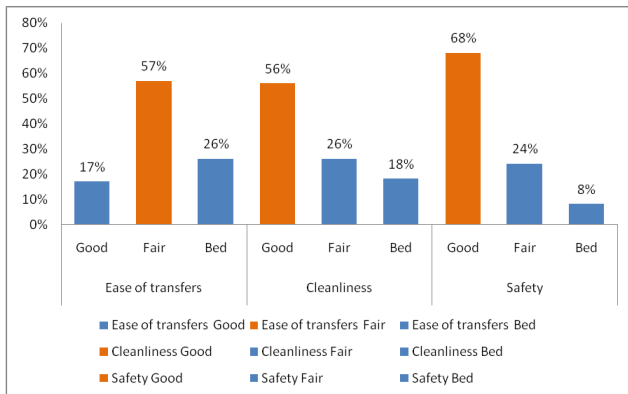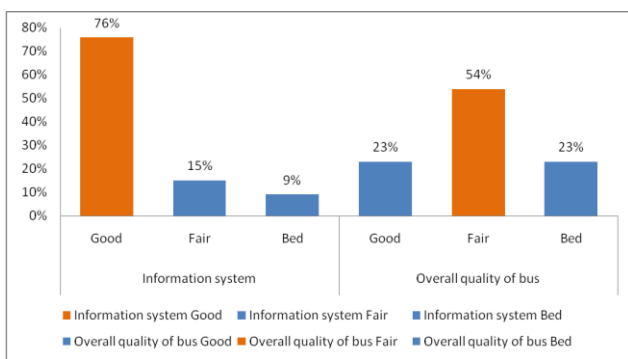Figure 5.Analysis Chart of Ease of Transfers, Cleanliness And Safety

Figure 6.Analysis Chart of Information System And Overall Quality of Bus

IV. CONCLUSION

- Data analysis show that bus frequency, comfort, ease of transfers and overall quality of bus are public give remarks as in fair condition and travel time of bus is need to remark of improvement.
- There should be uniformity in the frequency of buses adherence to strict timings is required to maintain service quality.

- Proper maintenance of buses and bus stands are required to retain the existing passengers and attracting the new ones. It is very necessary for the survival of public sector transit in the times to come.
- Bus drivers should stop the bus close to the bus stop and not in the middle of the road causing hindrance to public.
- There must be arrival and departure times at each bus stop.
- The conductor and driver must wear dresses having their names and employee number mentioned on it.
- There is a need to introduce special city bus to provide special service for female passenger.

Conclusively, we can deduce that majority of the respondents are not satisfied with the level of service of existing public transportation system. Moreover it is also found that passengers /commuters are not aware of the mandatory services to be given by the city buses. The researcher has tried to touch upon the minimum expectations of the commuting class. The suggestions are made on the basis of the interactive discussions with commuters; which could be incorporated into policy decisions of management.

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