Ridership Scenario of BRT System: A Case of Surat City

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Abstract

Transportation Plays a Key role in the social & economic growth. Today there are many transportation linked problems happens in city area. It comprises traffic Congestion, traffic accident, parking difficulties, pedestrian safety, security, Land acquisition. The objective of this paper is how to increase ridership and study existing scenario of ridership. Surat Public transportation portion is less with compare to other metro-politan city. Public Transport is attracting more people and decreases traffic congestion at much level. To overthrow this public transportation trouble efficient public transportation is needed. So Public transportation should support. There are many kind of public transportation but BRTS is one of the actual and accepted modes of public transport in urban area. Surat BRTS has been planned with the aim of mode shift from private vehicle to public transport and to reduce traffic congestion. At present BRTS and City bus serve as Public Transportation in Surat city. From the study research the current situation of BRTS in context of Surat city and recommendation and conclusion is based on current scenario. The study will be helpful to planner for improvement of BRT System.

***Key word**: Efficient public transport, BRT system Surat, Integrated rapid transit, Ridership*

Introduction

Urban transport system is the key issue in today's scenario due to incredible growth rate in urban areas and improper planning to accommodate incoming migrants. Rapid urbanization and rapid economic growth increase private vehicle ownership in developing countries. BRT is becoming more popular as it improves the overall efficiency and reliability of public transportation. Urban productivity is dependent on the efficiency of its transport system to move labour, consumers and freight between multiple origins and destinations. (Rodrigue J., 2006) BRT system has been defined as a separate corridor or a dedicated right-of-way or a bus lane reserved for buses on a major arterial road or freeway.

BRTS Transit use depends mainly upon the urban form. Urban form is a broad concept, implies the spatial patterns or arrangements of individual urban elements such as buildings, streets and land use. Urban forms can be represented by six groups of indicators: Density, Diversity, Design, Destination Accessibility, Distance to Transit, Demand Management Ridership is defined as the number of passengers using a particular form of public transport.

Ridership Scenario

Ridership of any public transport system is key component.

There are two methods to measure ridership:

- Average weekday, monthly, or annual boarding
- Transit journey-to-work (commute) mode share, and also the percent of work trips made by public transit.

There is a strong connection between transit ridership and land use and socio economic variables.

From this analysis one can predict future ridership under different circumstances. Land use type, transit accessibility, income and density are major factors for the determination of existing users and prediction of future users. The vehicular distribution can be given as: Two wheelers comprise nearly 77% of the total number of vehicles while cars constitute about 14%, three wheeler 4% and 5% other vehicle in Surat city. The modal share, currently in Surat city is: Private vehicles (cars and motorized two-wheelers: 60% to 70%; Intermediate Public Transport (Auto rickshaw): 20% to 25% and the modal share of public transport is less than even 1%. Currently City bus and BRTS serve as public transport in Surat city and it is extremely important to encourage usage of public transportation to attract more users.(Akhilesh, January, 2015) Hence, an attempt has been done in the present study to improve efficiency of BRTS and to suggest ways to increase its ridership.Planners should consider transit interdependencies with a broader range of transportation services and regional urban form characteristics. (ArnabChakrabortya, 2013)
Now a day mass transportation uses are increasing, the table is shows that ridership increasing year by year in BRT system.

Table Error! No text of specified style in document.**. Ridership Scenario (Year wise) of Surat BRTS**

BRTS-Parameters	Units	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
BRTS Network	Kms.	10	10	48	99	100.8
Route	No	1	1	4	8	8
Total Bus	No	9	24	43	109	117
Ridership		3800	5302	22823	67172	88098
Revenue	Rs.	41000	55580	218029	604401	818855
Area Covered(TOTAL)	Sq.km	11.7	11.7	40.75	64.12	68.48
Frequency Time	Min.	15-20	15-20	15-20	10-15	10-15
No.of Stops		-	17	84	147	155

(Source: SMC, Sitilink-Surat)

Total 9 number of routes in Surat BRT system. Among all routes of BRTS in city area the route SVNIT to ONGC corridor has **less ridership.**

Avg. Ridership = **874** passenger/day/km.

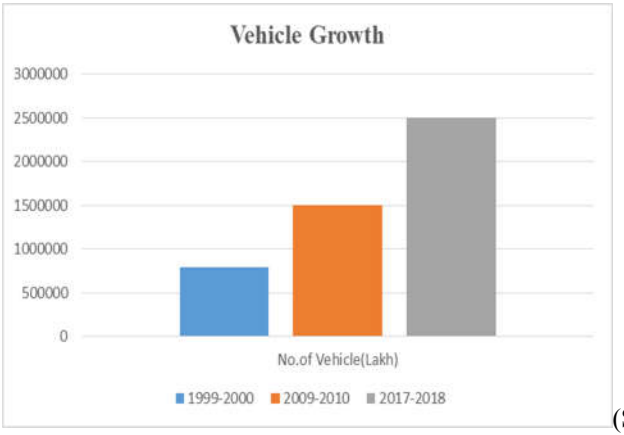
SVNIT to ONGC corridor: **398** passenger/day/km.

Problems and Issues related with BRTS and its ridership

In India, Many cities which have BRT system but in Surat city there were many lacking in successful running of the system in some circumferences like accessibility, connectivity to remote area and so on.To improve the performance of public transport and to make sustainable public transport in Surat city, this results in improvement in utilization of public transport. BRT system is basic and effective public transport service it is growing widely worldwide. The present study is taken up to improve the efficiency of BRT system Surat. The following major issues of Surat BRT system.

- Rapid urbanization & private vehicle users are increasing
- Inadequate ridership for BRT system
- Hazardous traffic movement at some un-signalized intersections

- Bus scheduling is not implemented effectively based on passenger demand.
- Rapid urbanization & vehicular growth are increasing 7.90 Lakh to 25 Lakh in last 18 year of Surat.
- Shift from private vehicle to public transport is not increasing after the implementation of BRTS



(Source: cot.gujarat.gov.in)

Figure 1:Vehicular Growth (Decade wise)

Surat have two mass transport system BRT &City bus.But Load factor and Benefit-Cost ratio (BCR) has less which given in below table.

Table2. Parameters Remark of Surat BRTS

Parameters	Remark
Benefit –Cost Ratio	0.55
Load Factor	57.56%

(Source: Sitilink, Surat)

As per the study of Surat BRT system it has scored 48 points, which is less than bronze category. So there is a need to improve the performance of Surat BRT system to make it more efficient. (Agarbattiwala T., 2016)

ITDP (Institute for Transportation and Development Policy) has given following standards for the evaluation of BRTS performance, which is shown in Table

Table 3.ITDP levels for BRTS

Category	Level
Gold Level	85 Above
Silver Level	70-85
Bronze Level	55-69

(Source: Institute for Transportation and Development Policy)

Factor affecting Ridership

It is necessary to take some steps to increase BRTS Ridership. BRTS Ridership can be increased by considering following different factors. (Frobom, 2003).

Level of Service (LOS)

Rider comfort

Cleanliness

Safety and security

Pedestrian comfort

Amenities

Parking spaces

Cost

Frequency, route coverage, ticket fare

Accessibility

Socio-economic profile

Landuse characteristics

Land use & building typologies have major influence on BRTS ridership. By examining this, one can determine, which kind of land use will subsidise more ridership.Socio economic profile also shows important part in BRTS ridership. For example LIG and MIG has higher involvement in BRTS ridership than HIG.There is a tendency to deliver higher FSI along BRTS corridor, which will clue to higher land values. So builders construct high rise building along BRTS routes, which is reasonable mostly by HIG. People from HIG have no inclination to use BRTS and Eventually BRTS ridership will reduce. So it is essential to check the impact of building typology on BRTS ridership. (Mithila Chaudhari, 2016). In context of Surat BRT system there are overlapping of other mass transport. Currently city bus and BRTS assist as public transportation in Surat city. Also, two routes (1.Sarthana to Khajod 2. Bhesan Depot to Saroli) of metro rails has been permitted by state government toadd one more public transportation system in Surat city. From these ways of metro rail, part of one route of Sarthana to Khajod will be overlay on BRTS route of Railway station to Kamrej. If metro rail will be provided on the same route of BRTS, it will straight impact BRTS ridership.

Conclusion

Surat BRTS ridership are in increasing year by year but As per the analysis and study of current scenario there are still lacking in ridership and also the benefit-cost ratio and load factor is also less, thus it indicate the lacking in ridership. Other analysis also shows the Industrial land use, commercial land use, recreational land use and residential land use (LIG, MIG) are responsible to increase BRTS Ridership and empty land use is one of the factors for less BRTS Ridership. Higher Population mass and higher working population density alongside with LIG, MIG

and EWS housing, produce higher ridership. Availability of city bus, with higher connectivity on the same route of BRTS can also be one of the reason for less ridership of BRTS. For the improvement of BRTS ridership it must provide by feeder system, strong accessibility, and awareness regarding to using mass transport system.

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