A Comprehensive Review of BRT System Introduced in Ahmedabad

[1]Jishnu Gohel
[1]Student M.E.
[1]M.E. Civil (Infrastructure Engineering)
[1]LDRP-Institute of Technical Research, Gandhinagar, India

***Abstract* -Traffic congestions have become a major problem in the populous cities of India and Ahmedabad is no exception to it due to its high population density, rapid urbanization, industrialization and lack of traffic discipline. Transportation researchers had brain-stormed for many different alternatives to resolve the issue of traffic congestion and finally a BRT system for Ahmedabad named as "Janmarg" was zeroed upon to. Initially it was thought that BRTS was a sure shot ticket for the short comings of public transportation problems faced by AMTS (Ahmedabad Municipal Transportation Services) alone as there was no other major transportation system prevailing in the city. Also it was in parallel thought by the planners that a multi-modal transportation system is now must for a city like Ahmedabad which is the most populous city and also the financial capital of Gujarat. With these considerations a rail project was announced as early as in 2003. The objective of this paper is to provide a literature review of the comparative analysis of BRTS with other transportation systems justifying the need and analysis of the same.**

***Index Terms* - Average Travelling Speed, AMTS, BRTS, Metro-Rail.**

I. INTRODUCTION

It has been revealed that the cities of Asia have shown higher growth of two-wheelers than the rest of the world. Traditionally two wheelers are used for daily travel. The population in India is increasing tremendously and this has also led to a very high rate of two-wheeler density in the developing cities leading to many traffic problems on the roads. This has always led almost all the major roads of the city to be congested during the peak hours. The existing road designs that are prevailing today are thus not adequate and this results in slow moving traffic. These modern day complications of the road transportation have addressed to a proper research work to be carried out, analysis of the same requiring long term sustainable planning with adequate flexibility and lucidity to accommodate easy upgradations. In Ahmedabad apart from AMTS and BRTS, the two public transportation systems, auto-rickshaws have always been a para-transit system and then comes the two-wheelers and four-wheelers as personal transportation systems.

The patronage towards public transportation system had been fairly less prior to the introduction of the BRTS in Ahmedabad. With large number of two-wheelers purchased by the citizens and the street network complementing to it, the BRTS deliberated a lot of criticism because it uses the median-lane.

At the same time, Janmarg has been always under the scrutiny because of constant comparison with the inadequacies faced by other regional BRT systems in India and the successful international BRT systems around the world. Considering the above facts and figures, and taking it into account, this article is put to study and an open discussion.

II. OBJECTIVE

- To carry out a detailed study for the prevailing BRT system in Ahmedabad.
- To provide a comparative analysis of BRTS versus Metro.
- To provide with comparative benefits of a BRT system for similar environment.

III. LITERATURE REVIEW

The Transportation planning is a process wherein a transportation system is either introduced or an existing system is upgraded for the betterment of the society and therefore the system has to perform various tasks which are likely to be:

1. Accommodate existing population.
2. Cover the distances in minimum specified time to avoid recurring losses.
3. Make city well connected throughout the functional hours.
4. Establish a connection with the existing system of transportation.

And therefore one has to carry-out the detailed analysis for the following prior to the introduction of the system:

- traffic forecast encompassing origins and destinations (O/D) relevant for the project
- shift factors
- volumes to be shifted from other modes of transport
- estimating competitive/favorable prices
- reliability of the new system
- frequency and flexibility of the system
- ability to carry heavier volumes

- geographical coverage
- route options
- number of terminal locations
- potential terminals
- degree of uncertainty around the detail
- Environmental Impact Statement

Based upon the availability of above documentations, researches, surveys and recommendations a channelized system of transportation is conceptualized initially which at later stages is planned for the region.

As the initial cost of construction for a metro-rail is very high as compared to the BRT systems, BRTS was thought of as an option as a basic thumb-rule. Also, the construction of metros involve more inconvenience to the public and to business, and for a longer time as compared to the BRTS construction. Looking at the construction practices in India, the underground construction of metros are likely to interfere and endanger the sewer system, gas pipes, water supply lines & under-ground electric conduits; while that may not be the case in BRTS construction. Also, the benefits of the BRTS can be reaped in shorter time durations which are likely to be:

- Efficient, reliable and frequent services
- Decreased road congestion
- A safe and secure public transport system
- Economic development in and around the areas of BRT operation
- Reduction in pollution
- Closed, high quality stations
- Decreased energy consumption and vehicle emissions
- Modern, clean vehicle
- Superior customer service
- Operational flexibility
- Creating community spaces along the corridor

BRTS, previously could not perform up to the mark in Delhi because of very high population density. Therefore BRTS was required to be placed where it could be re-branded and Gujarat always taking the lead in innovation, Ahmedabad was taken for implementing BRTS. Also when BRTS was introduced the population density of Ahmedabad was not so high that a metro could be recommendable. It was thought that initially the benefits of BRTS could be exploited generating funds, and a metro at later stages could be worth when commuter base of required strength is achieved.

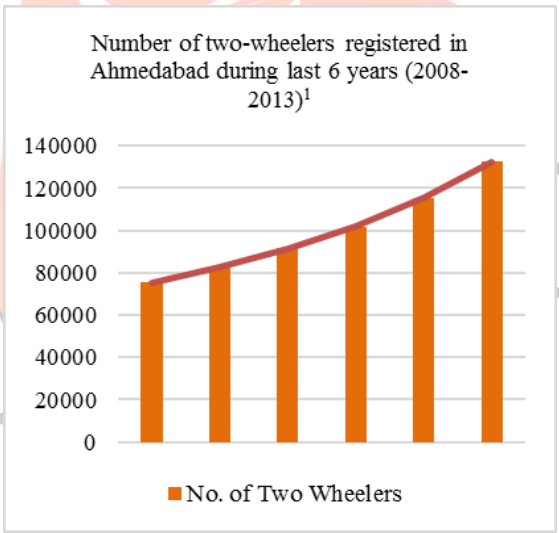

Fig 1 No of Two Wheelers registered in Ahmedabad during last 6 Years.

And answering one of the most critical question HOW MUCH TRANSIT DOES 1 billion US $ buy? [2]

- 400 Kilometres of BRT
- 7 Kilometres of SUBWAY
- 14 Kilometres of ELEVATED RAIL

With the above monetary figures, one could put a figure on the geographical coverage of BRTS against the geographical coverage of the metros in a given budget. Alternatively while introducing BRTS in Ahmedabad what had to be dealt as a major problem was the short-comings of the Delhi BRTS. Because of its adverse publicity, Janmarg which is much better had to face many tests before introduction like:

- Preconceived notion of the people towards accepting BRTS
- Negative impact to people travelling in BRTS buses

- People believing that general traffic lanes experienced long queuing as the median-lane is occupied for BRTS
- The bus breakdown affects operations of the buses, increases the travel-time reducing efficiency of the system.

But the BRT system of Ahmedabad has emerged out as a successful system and is consistently growing and constantly upgrading to achieve the better satisfaction of people. With modern bus shelters equipped by ITS (Intelligent Transportation System), Innovative junction design, Landscaping along the corridor, BRTS infrastructure complementing urban scape and Multi-level BRT Interchange[3]. It has contributed to provide a complete new image to the city as a whole and the branding of Janmarg has helped significantly in introducing BRTS in Surat and Rajkot as operated under the names of "SITILINK" and "RAJPATH" respectively. It has been observed that after the announcement of high density corridor along the BRTS route the real-estate prices have appreciated upto 65% in the areas of vicinity in Ahmedabad. From the developers' view point in the new DP of Ahmedabad, the development authority has raised the Floor Space Index (FSI) limit from 1.2 to 4 meaning that a developer can now build a 40,000m^2 area on a 10,000m^2 plot. "Real estate projects have become more viable along the corridor because of higher FSI," said Neeraj Tomar, head of Ahmedabad operations at Jones Lang LaSalle. Thus BRTS has completely boosted up the scenario of the real-estate market of Ahmedabad.

IV. OBSERVATIONS

Fig 2 Multi-Level BRT Interchange3

It has been observed that the average speed of the BRTS is much higher (30kmph) than AMTS (15-20kmph) because of the dedicated Median Bus Lanes. Also, BRTS buses are given priority at traffic stops, which has reduced the travel time of passengers drastically. The average waiting time for AMTS is 15 minutes while that of BRTS during off-peak hours is also not more than 4 minutes, while in peak hours it is even less. The traditional city bus service AMTS complements BRTS. The buses are cleaner and greener so compared to the other transportation systems it makes BRTS to be one of the cleanest mechanisms to travel-in. For any extension and expansion of the BRTS, there are fewer requirement of specialized infrastructure.

V. CONCLUSION

At the stage from the given literature study, which states much of the planned growth of the city; it can be concluded that Ahmedabad – a compact city characterized by mixed land uses, high density development and balanced street network system with well-developed ring-roads and radials, BRTS was a good option to start for. Also continuous upgradations and expansion have been observed and therefore it has become a life-line for the city.

REFERENCES

[1] https://data.gov.in/catalog/total-number-registered-motor-vehicles-india#web_catalog_tabs_block_10

[2] http://www.slideshare.net/SankalpChandel/brts-19708668-slide52

[3] http://www.slideshare.net/EMBARQNetwork/001-abhijit-lokhre-slide19

[4] http://daily.bhaskar.com/news/GUJ-AHD-brts-drives-land-rates-up-50-on-iskcon-bopal-stretch-4267943-NOR.html

[5] Gujarat Infrastructure Development Board, Government of Gujarat, Ahmedabad Municipal Corporation & Ahmedabad Urban Development Authority, CEPT University. "Ahmedabad BRTS Phase-1 DPR_Feb 2007"

[6] Ahmedabad Urban Development Authority, Government of Gujarat, CEPT University & Ahmedabad Municipal Corporation. "Ahmedabad BRTS Phase-2 DPR_April 2008"

[7] ITDP, GIZ, ClimateWorks Foundation, Rockefeller Foundation, ICCT. "The BRT Standard 2013"

[8] The William and Flora Hewlett Foundation, United Nations Environment Program (UNEP), GTZ, Global Environment facility (GEF), ITDP. "Bus Rapid Transit Planning Guide- June 2007"