

# PRELIMINARY ASSESSMENT OF BUS RAPID TRANSIT SYSTEM FOR URBAN ROADS

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**Abstract:** -- Bus rapid transit is applied to a variety of public transportation systems using buses to provide faster, more efficient service than an ordinary bus line. The goal of these systems is to approach the service quality of rail transit while still enjoying the cost savings and flexibility of bus transit. Those are Alignment in the center of the road to avoid typical curb-side delays, Stations with off-board fare collection to reduce boarding and alighting delay related to paying the driver. Station platforms level with the bus floor will reduce a boarding and alighting delay caused by steps and Bus priority at intersections to avoid intersection signal delay. In Hyderabad one of the most hectic Problems is traffic. Even though we have many roads, but do not have a proper traffic system. The rapid growth in the number of Motor vehicles has resulted in severe traffic congestions and air pollution not only in Hyderabad but also many cities of the country. To have traffic less end to reduce pollution, the BRT System should come in to the implementation. So, study has been made to make a project on BRTS to develop the BRT System in Hyderabad.

**Keywords** -- BRTS, Traffic congestion, Transportation, Level of Service.

## I.INTRODUCTION

India is one of the largest and fastest growing economies in Asia and the entire world especially in transport. The transport is important for the development of a country. Growth of urban population has created serious challenges and imposed greater demand on the resources of municipal governments in India. The public transport remains the primary mode of transport for most of the population, and India's public transport systems are among the most heavily used in the world. The present transport system of India comprises several modes of transport including rail, road, coastal shipping, air transport, etc. Traffic in Indian cities generally moves slowly, where traffic jams and accidents are very

common. India population is more so where two wheeler and four wheeler vehicles are increase day by day, it causes to the traffic congestion and delays. It is seen not only one place, all over India.

Problems of public transport occur within the broader context of demoralizing urban transport problems in general. Air pollution, noise, congestion, and traffic fatality levels are often much more severe than those experienced in the developed countries. Transportation and basic infrastructure systems have not kept pace with urban growth, further disadvantaging the poor. Road systems are piecemeal, grossly overloaded and under maintained, while the number of motorized vehicles increased at extraordinary rate (World Bank, 2001; Figueroa, 1996). Public transportation, which tends to be fragmented between public authorities and a myriad of private carriers, cannot extend too many of improvised settlements because the quality of roads is bad.

National Urban Transport Policy has emphasized on more equitable allocation of road space to people, rather than vehicles, greater use of public transport and non-motorized modes and reserving lanes and corridors exclusively for public transport and non-motorized modes of travel.

Bus rapid transit (BRT, BRTS) is a bus-based mass transit system. A true BRT system generally has specialized design, services and infrastructure to improve system quality and remove the typical causes of delay. Sometimes described as a "surface subway", BRT aims to combine the capacity and speed of light rail or metro with the flexibility, lower cost and simplicity of a bus system.

## 2 Need for the Study

In India, the growing trend toward private transportation increases congestion. With the phenomenal increase in the personalized motor vehicles, one of the major problems confronted by the motorist is the occurrence of traffic delay. Roads are getting congested. Indian government should pass legislation to control vehicles on roads and enforce tougher environmental regulations. With the majority of World Bank funds allocated toward transportation and highways, the government should adopt the latest technology and introduce metro rail, monorail to reduce congestion and accidents on roads. But still road users have face traffic problem like congestion, predictable travel-time delays and road

accidents are taking a serious shape. The study of BRT system helps to reduce the wastage of time, increase the economic health, to reduce the pollutants released from

vehicles, to reduce frustration developed in drivers. The best example is Ahmedabad bus rapid transport system.

### 3. Objectives of the Study

The main objectives of the present study are presented below

- To relieve the traffic congestion.
- To analyze the present traffic condition.
- To provide good level of service during the peak hours.
- To encourage people to opt for public transportation for the welfare of government.
- To present BRTS as a clean, modern, fast, safe, and reliable transportation solution to the public.
- Better quality, better service and providing value for the investment.

### 4 Bus Rapid Transit System (BRTS):

Bus rapid transit system is a “bus based mass transit system that delivers fast, comfortable, and cost effective urban mobility” this system have separate lane for buses. The ‘Rapid Transit’, which describes a high- capacity transport system with its own right-of-way, implemented using buses through infrastructural and scheduling improvements, to provide a high level of service. It incorporates most of the high quality aspects of metropolitan systems without the high investments, it uses available space on arterial roads of cities with dedicated bus ways and it utilizes modern technologies for optimizing flow, passenger movement, ticketing, bus scheduling, and traffic signal priority. Bus Rapid Transit system as an approach to providing superior transit service with buses that integrate technology, an operating plan (or service design), and a customer interface.

### Historical Development of BRTS

BRT has now become a worldwide phenomenon; its current operation area around the world.

**BRTS in World:** The first wide scale development of Bus Rapid Transits started in Curitiba, Brazil in 1974, although there were several smaller scale projects prior to its development. Since then, Curitiba’s experience has inspired other cities to develop similar systems. In the 1990s, the replication of the BRTS concept gained

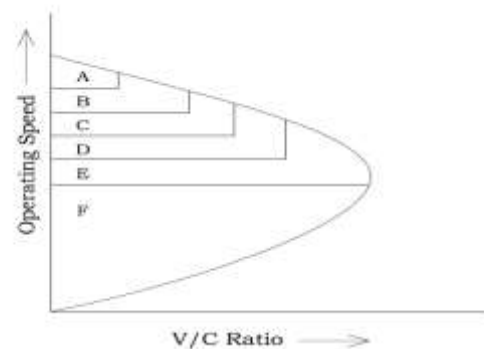
momentum and BRTS were opened in Quito, Ecuador (1996), Los Angeles, USA (1999) .in year 2000 the Transmilenio system in Bogotá, Colombia was opened and get a grand success, after the successes of

Transmilenio system Bogotá the concept of BRTS is adopted worldwide. Moreover 100 BRT systems was running success fully around the world & approximately 150 series are under construction.

**BRTS in India:** In India, it has become operational so far in cities like Delhi, Ahmadabad, Jaipur, Indore, Pune, Bhopal Vijayawada and Rajkot, covering a total network of over 120 km. The investment involved till now in the development of BRTS in these cities would come upto more than Rs.13.6 billion. Expansions of the BRTS network in these six cities are either already in progress or are being planned. Moreover, six new BRTS projects are already underway in cities like Kolkata, Hubli-Dharwar, Surat, Visakhapatnam, Naya Raipur and Pimpri-Chinchwad.

### Level of service

Level-of-Service (LOS) of a traffic facility is a concept introduced to relate the quality of traffic service to a given flow rate. Level-of-Service is introduced by HCM to denote the level of quality one can derive from a local under different operation characteristics and traffic volume. HCM proposes LOS as a letter that designates a range of operating conditions on a particular type of facility. Six LOS letters are defined by HCM, namely A, B, C, D, E, and F, where A denote the best quality of service and F denote the worst. These definitions are based on Measures of Effectiveness (MoE) of that facility. Typical measure of effectiveness includes speed, travel-time, density, delay etc. There will be an associated service volume for each of the LOS levels. A service volume or service flow rate is the maximum number of vehicles, passengers, or the like, which can be accommodated by a given facility or system under given conditions at a given LOS.



Level of service A to F

## 5 LITERATURE REVIEW

**Agarwal P K, Sharma Anupama, Singh A. P (2010)**, “An Overview on Bus Rapid Transit System”. An important advantage of BRTS is its flexibility. This

approach lends itself to incremental learning of the problem, and eliminating mistakes as the development proceeds. The relatively low implementation costs also don't leave taxpayers tied to one particular technology or solution. The commuters prefer to board/alight at intersections, thus creating informal bus stops which cause hazardous Traffic conditions; it is advisable to plan the facilities as per the commuters' requirements. Kerbs dividing the lanes may lead to accidents without physical kerbs but the lane segregation will not be possible without the kerb stones these can be suitably redesigned to take care of safety aspect. The signal system should be resorted to at the junctions to minimize the merging/ weaving of the traffic.

**Anuj Jaiswal, K. K. Dhote, R. Yadu Krishnan, Devansh Jain (2012)**. Bus rapid transit system: a milestone for sustainable transport: a case study of janmarg BRTS, Ahmedabad, India. BRTS Ahmadabad has improved access for local riders and advanced public transportation systems while reducing the environmental impacts of transportation. Under the 'Regular bus operations' the quality of bus services tends to deteriorate after certain level of operations. BRTS will also improve operating conditions for personalized vehicles. The various contributing factors towards this are: segregated traffic, improved road surface quality, better lighting, and junction improvements and shifting a part of heavy traffic to outer ring road. Some of the BRT corridors are presently highly accident prone. With traffic segregation, exclusive pedestrian and bicycle facilities, better illumination, effective regulation, training and public education, accidents on these roads are likely to come down by 75 to 90%.

**Tuhin Subhra Maparu and Debapratim Pandit (2010)**. A Methodology for Selection of Bus Rapid Transit Corridors: A Case Study of Kolkata. The paper aims at formulation of a methodology for selection of corridors for introduction of BRTS in urban areas in India and Kolkata in particular in the context of present challenges like increasing traffic congestion and car ownership, lack of road and transport infrastructure and gradual deterioration of LOS of bus transit system. A methodology and planning framework for selection of BRT corridors for bus transit reform and redesign in urban areas in India and Kolkata in particular in the context of the present challenges of increasing traffic

congestion, car ownership, and lack of road and transport infrastructure and gradual deterioration of LOS of bus transit system. Incorporation of feasibility constraints both for selection and phasing of BRT corridors would enable planners and decision makers to

make more informed decisions about implementing BRTS in Indian cities.

### Study Area

Primarily the corridor selection is made on the basis of the traffic volume in the city, the people in the corridor suffering from heavy traffic, traffic jams and traffic congestions may make use of BRTS. The Selected corridor is from Panjagutta to Miyapur (via Kukatpally) is shown in Fig.3.10 which has NH9. The total distance of this stretch is 14km. This is completely commercial area with 15 stops. These are Panjagutta, Ameerpet, Mitrivanam, S.R nagar, E.S.I, Erragadda, Bharath nagar, Moosapet, Kukatpalli, KPHB, JNTU, Nijampet cross road, Hider Nagar, Calvary Temple and Miyapur cross road. This corridor consists of 5 junctions they are,

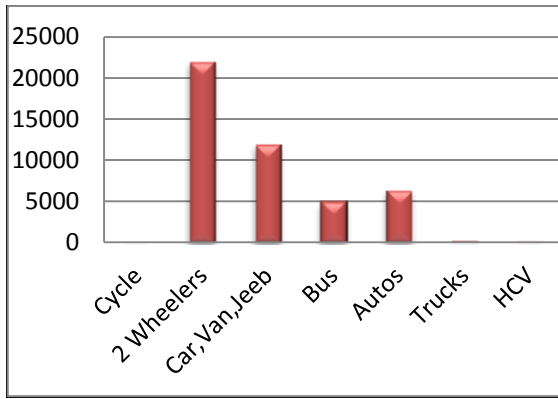
1. Panjagutta
2. Mitrivanam
3. Moosapet Y-Junction
4. JNTU
5. Miyapur.



**Map of selected corridor in Hyderabad**

In areas of Panjagutta, Ameerpet, Kukatpalli and KPHB, there is more shopping complex. Mitrivanam, S.R Nagar areas have educational areas and Jawaharlal Nehru Technology University is located in JNTU area, E.S.I Hospital is located in E.S.I stop, Raithubazar and Fruit market are there in Erragadda stop. People who are going to BELL, Patancheru and ligampalli areas, they use the way on JNTU, Miyapur Cross roads only and this stretch connects to the industrial areas like Balanagar, Bell. Because of these conditions, this stretch is having more traffic jams and delays.

### Observations and results on traffic in Panjagutta to Miyapur



**Traffic volume at Panjagutta**

PEAK HOURS	BUS	AUTOS	TRUKS	HCV
<b>MORNING</b>				
7.30-7.45	88	68	13	15
7.45-8.00	84	72	7	12
8.00-8.15	122	94	8	11
8.15-8.30	131	115	0	2
8.30-8.45	196	168	6	9
8.45-9.00	232	183	4	18
9.00-9.15	228	214	12	4
9.15-9.30	247	311	15	3
9.30-9.45	253	380	11	5
9.45-10.00	189	360	8	9
10.00-10.15	208	340	12	12
10.15-10.30	193	296	3	14
<b>SUM</b>	<b>2171</b>	<b>2601</b>	<b>99</b>	<b>114</b>

PEAK HOURS	BUS	AUTOS	TRUKS	HCV
<b>EVENING</b>				
4.00-4.15	191	230	8	0
4.15-4.30	195	245	12	15
4.30-4.45	184	265	5	7
4.45-5.00	169	298	15	6
5.00-5.15	191	315	18	0
5.15-5.30	238	324	23	0
5.30-5.45	222	272	9	7
5.45-6.00	346	351	5	4
6.00-6.15	289	395	0	1

6.15-6.30	334	410	0	0
6.30-6.45	249	381	15	0
6.45-7.00	278	344	5	0
<b>SUM</b>	<b>2886</b>	<b>3830</b>	<b>115</b>	<b>40</b>

**CONCLUSIONS**

1. As there is heavy traffic in the stretch from Panjagutta to Miyapur. The level of service is F condition in Panjagutta, Ameerpet, Mitrivanam areas which is known to be Fully Congested. After applying BRTS, the condition will change from F to B or C condition.
2. Level of service is E condition in Bharath nagar, Moosapet areas which is known to be congested. After applying BRTS, the condition will change from F to B or C condition.
3. Level of service is D condition in SR Nagar, Erragadda, JNTU, Miyapur areas which is known to be unstable flow. After applying BRTS the condition will change from D to B condition.
4. Where provide good level of service during the peak hours, it provides good level of service during the peak hours.
5. It gives the better quality, better service and providing value for the investment.
6. It presents as a clean, modern, fast, safe, and reliable transportation solution to the public.
7. Increasing ridership attraction.

**RECOMMENDATIONS**

1. Construct foot over bridge to reduce pedestrian crossing on road, which increases the moving time of traffic.
2. Elevated BRT System is suitable for areas having 2, 3 lanes and lesser road width with highly traffic.
3. Provide footpath for pedestrians.
4. No permission should be given to road side vendors and stalls.
5. Market should be allotted a place far away from the road side.
6. RTO should give limited permission to two wheelers per house.
7. Different timings should be allotted for opening and closing of different public, private and educational centers.

**FUTURE SCOPE**

At present Hyderabad has more traffic related problem. This study has a lot of scope to prevent traffic delays and

road accidents in future. This study was limited for Panjagutta to Miyapure area but same kind of work is recommended to remaining areas to reduce traffic delays and rate of road accidents. This kind of study is suitable for any area in the Hyderabad and any city in India.

## REFERENCES

1. Agarwal P K, Sharma Anupama and Singh A. P (2010), "An Overview on Bus Rapid Transit System", Journal of Engineering Research and Studies.
2. Anuj Jaiswal, K. K. Dhote, R. Yadu Krishnan and Devansh Jain (2012). Bus rapid transit system: A mile stone For Sustainable Transport: A Case
3. Study of Janmarg Brts, Ahmedabad, India, OIDA International Journal of Sustainable Development.
4. Tuhin Subhra Maparu and Debapratim Pandit (2010), "A Methodology for Selection of Bus Rapid Transit Corridors: A Case Study of Kolkata", Institute of Town Planners, India Journal.
5. Madhuri Jain, Arti Saxena, Preetvanti Singh and P.K. Saxena. "Developing bus rapid transit system in India".
6. Devarshi Chaurasia (2014). "Bus Rapid Transit System (BRTS): A Sustainable Way of City Transport (Case Study of Bhopal BRTS)", International Journal of Engineering and Advanced Technology.
7. Geetam Tiwari, Dinesh Mohan, Sandeep Gandhi, B. Sriram, Sonia Kapoor, Ruchi Verma, Dheeraj Gupta, Mahesh Gaur (2005), "First Delhi brt corridor, A design summary Ambedkar nagar to Delhi gate". Transportation Research and Injury Prevention Programme.
8. Bhanu Kireeti Chanda & Addali Sai Satya Goutham (2014), "Introduction to corridor selection & assessment for Bus Rapid Transit System (BRTS) in Hyderabad, American Journal of Engineering Research (AJER).
9. H.S. Kumara (2009), "Planning for Bus Rapid Transit System in Indian Metropolitan Cities: Challenges and options", Institute of Town Planners, India.
10. Ajay Mishra, Saxena Anil Kumar, Purohit Pradee, "Study of Bus Rapid Transit system In Respect to Growing Cities of India", International Journal of Engineering Research & Technology.
11. "Hyderabad Wikipedia".
12. "Hyderabad Google Map".
13. "Principles and Practice of Highway Engineering" by Dr.L.R.Kadiyali, Dr.N.B. Lal, Khanna publishers Delhi-6.
14. S.C.Wirasinghe, L. Kattan, M.M. Rahman, J. Hubbell, R. Thilakarathne and S. Anowar, "Bus rapid transit – a review", International Journal of Urban Sciences, 2013.
15. Darshit M. Shah, Deepa Akshay Patel, "Impact of Brts on Urban Traffic a Case Study of Ahmedabad" GRA – Global Research Analysis.