Alternative solution on Kiwale phata to Aundh BRTS Route

Yogita S.Jadhav [#1], Prof. Milind M.Darade [#2], Prof.Pranay R.Khare [#3]

[123]*Department of Civil Engineering, Dr.D.Y.PATIL Lohegaon*

---***--

Abstract - *Bus Rapid Transit system is an innotiative , high capacity, lower cost public transportation solution that can significantly improve urban mobility. Bus Rapid Transit,refers to a system of buses that operate more like a conventional rail system than traditional local buses we are all accustomed to riding. These are sophisticated bus systems that have their own lanes on city streets are use bus stations instead of bus stops. This allows for faster, more orderly boarding's. When compared to traditional bus systems, bus rapid transit is fast, efficient and user – friendly but due to increase in road accident it need more safety. 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.*

Keywords - **BRT, pollution emission, Easy transport , Speed**

I. INTRODUCTION TO BUS RAPID TRANSIT SYSTEM

The accidents are of three types, one - due to their effects or seriousness of accidents, two - fatal accidents and three - injury and property damage. Man behind the wheel plays an important role in most of the cases as study shows that most of the accidents occur due to carelessness or lack of road safety awareness of the road user. Hence road safety education is an essential as any other basic skill of survival. There are about twenty seven thousand four hundred eighty nine are three wheeler vehicles provided for intermediate passenger services, two lakhs sixty five thousand six hundred seventy four are four wheeler vehicles, twenty five thousand five hundred forty four are eight wheeler vehicles operating point to point services and one thousand six hundred thirty six are of other vehicles.

All routes are covered by Pune Municipal Corporation (PMC) and Pimpri-chinchwad Municipal Corporation (PCMC) in the city of Pune and Pimpri-chinchwad.

Corridors of BRTS are given below:

1. Dapodi - Nigadi
2. Sangvi Phata - kiwale
3. Kalewadi Phata - Dehu Alandi road
4. Nashik Phata – Wakad

II.PROBLEMS IN ROAD TRANSPORT

1. Since 1960, Pune traffic has increase by 105 times whereas the road network has grown by merely by 6 times.
2. Inefficient road network.
3. Poor traffic management.
4. Unruly traffic.
5. Inefficient public transport

III.What is BRT?

Bus rapid transit can simply be defined as a rapid mode of transportation that can coalesce the quality of rail transit and flexibility of a bus (Thomas 2001). Transport research board 2001 cited in (Levinson et al. 2002) defined bus rapid transit in a more simplified and understandable way as a flexible and rubber-tired rapid transit mode that combines running way, intelligent transportation system (ITS) elements, stations, vehicles and services into an integrated system with a strong positive image and identity. Bus rapid transit is a project embarked in phases as fund and opportunity permit because of the service flexibility.

III.LITERATURE REVIEW

A road safety audit can be defined as "a formal examination of an existing road or traffic project, in which an independent examiner reports on the project's accident potential and safety performance" (Austroads 1994). It involves "evaluation of physical elements and their interaction having a direct bearing on the safety of road users and others affected by a road construction scheme, in order to detect foreseeable potential safety hazards" (Dot 1990).

In the context of highway design, the term "Human Factors" denotes the attachment of emphasis on road user characteristics. Among the main categories of factors contributing to traffic accidents. Two main areas can be identified (Kanellaidis 1996) in the context of human factors in road and traffic engineering:

- Area i: Effect of highway design on driver behavior
- Area ii: Consideration of driver behavior variability

Towards the improvement of the safety on the road it is required to engineers to "learn to see the highway in the eyes of the ordinary driver" (Messer et al. 1981; "guidelines" 1996) is highly relevant in the case of road safety auditors. A question arising from that consideration is whether, and to what extent, input from the actual road users can be utilized in the RSA process.

British guidelines for RSA ("guidelines" 1996) mention "feedback from road users" as a possible input during the monitoring (follow-up) phase of an audited road, to establish whether the perception of safety in a completed scheme is up to the users' expectations. An even more substantial step in the direction of public involvement in road safety would be to seek the opinion of road users during the auditing process itself.

The public panel can provide inputs in one or more of the following forms (Wright and Boyle 1987; Brackett 1993; Zeitlin 1993; Kanellaidis and Dimitropoulos):

- Ratings of road hazards.
- Verbal (oral or written) description of potentially hazardous sites.
- Presenting the road user with a checklist/questionnaire for assessing safety.

The 1991 Gerondeau report [ASCE] suggested that European countries should pursue new forms of action to benefit from one another's experience in road safety issues. Particular importance has been attached to accident prevention.

Road safety: Discussion of state of practice (Gary S. Spring, P.E., M.ASCE). This paper introduces the special issue of transportation engineering (JTE). This focus the past, present & future solutions to the problems related to the T.E. in us. It gives the review of safety's history & also some current initiates & some new directions toward the safety issue.

Roads are continued to be a significant danger to the health & welfare of society & also effect on economic resources. In us, the annual cost of road fatalities exceeds $137 billion (Sinha et al. 2002). While we have continuously understanding the human factor & behaviors & provide better geometric design, road performance & better management systems. There are many way to solve the safety related issues. So we need to find out advanced technologies that help us to improve road safety related problems. We need better understand the role of human factor in our road designs; we need better technology for making prediction & assessments of safety issue. So for that we need better management systems, planning & design processes

The higher the volume of traffic on a road, the stronger is the case for public transport. In India, the low–cost /low–quality public buses are now not preferred by the upwardly mobile strata. Rail-based systems (such as Metro /Monorail) are very expensive to build & maintain & will therefore, not have extensive reach for a long time to come. No city has ever been able to —build‖ its way out of the problem. A new, faster

& cost efficient system is required for quality conscious groups, over & above the existing low quality bus network. BRTS fulfils these requirements & is perhaps, the only available alternative worth exploring. In addition, many suburban cities exceed the aggregate employment base of many urban city CBDs but do not currently have the focus and density to make

rail-based rapid transit a cost effective investment. BRTS can be the most cost-effective means of serving a broad variety of urban and suburban environments. BRTS vehicles, whether driver-steered or electronically guided, can operate on streets, in freeway medians, on railroad rights-of way, on aerial structures, and underground.

IV.PASSENGER CAR UNIT

  Different classes of vehicles such as cars, vans, buses, trucks, auto rickshaws, motors cycles, bullock carts, etc. are found to use the common roadway facilities without segregation on most of the roads in developing countries of India. The flow of traffic with unrestricted mixing of different vehicle classes on the roadway forms the heterogeneous traffic flow or the mixed traffic flow. The different vehicle classes have a wide range of static characteristic such as length, width etc. and dynamic characteristic such as speed, acceleration etc. Apart from these, the driver behavior of different vehicle classes is also found to vary considerable. Therefore the mixed traffic flow characteristics are very much complex when compared to homogeneous traffic consisting of passenger car only. It is rather difficult to estimate the traffic volume and capacity of roadway facilities under mixed traffic flow, unless the different vehicle classes are one common standard vehicle unit. It is common practice to consider the passenger car as the standard vehicle unit to convert the other vehicle classes and this unit is called Passenger Car Unit or PCU. Thus in mixed traffic flow, the traffic volume and capacity are generally expressed as PCU as per hour or PCU/lane/hour and the traffic density as PCU per kilometer length of lane.

The PCU may be considered as a measure of the relative space requirement of a vehicle class compared to that of a passenger car under a specified set of roadway, traffic and other conditions. If the addition of one vehicle of a particular class in the traffic stream produce the same effect as that due to the addition one passenger car, than that vehicle class is considered equivalent to the passenger car with a PCU value equal to 1.0. The PCU value of a vehicle class may be considered as the ratio of the capacity of a roadway when there are passengers only to the capacity of the same roadway when there are vehicle of that classes.

V.Recommended PCU Factors for Various Types of Vehicle on Urban Roads (IRC 106 – 1990):

        The Equivalent PCUs of different vehicle categories do not remain constant under all circumstances. Rather, these are a function of the physical dimensions and operational speeds of respective vehicle classes. In urban situations, the speed differential amongst different vehicle classes is generally low, and as such the PCU factors are predominantly a function of physical dimensions of the various vehicles. Nonetheless, the relative PCU of particular vehicle type will be affected to a certain extent by increase in its total proportion in the total traffic. Considering all these factors, the conversion factors are shown in Table below are recommended for adoption by IRC 106-1990.

Sr. no.	Vehicle Type	Equivalent PCU Factor Percentage composition of Vehicle type in traffic stream	
		5%	10% and above
1	Two Wheelers Motorcycle Or Scooter Etc.	0.5	0.75
2	Passenger Car, Pick Up van	1.0	1.0
3	Auto Rickshaw	1.2	2.0
4	Light Commercial Vehicle	1.4	2.0

5	Truck Or Bus	2.2	3.7
6	Agricultural Factor Trailer	4.0	5.0
7	Cycles	0.4	0.5
8	Cycle Rickshaw	1.5	2.0
9	Tanga (Hoarse Driven Vehicle)	1.5	2.0
10	Handcart	2.0	3.0

Table 1:Recommended PCU Factors for Various Types of Vehicle on Urban Roads:

V. FACTORS AFFECTING PCU VALUE:

a) Vehicles characteristics such as dimensions, power, speed acceleration and braking characteristics.
b) Transverse and longitudinal gaps of clearance between moving vehicle which depends upon the speeds, driver characteristics and vehicle classes at the adjoining spaces.
c) Traffic stream.
d) On intersections and the types of intersections.
e) Regulation and control of traffic such as speed limit, one way traffic, presence of different traffic control device etc. characteristics such as composition of different vehicle classes mean speed and speed distribution of the mixed traffic scheme, volume to capacity ratio etc.

VI Case Study :Kiwale Phata to Aundh road

The major elements of bus rapid transit are described below.

➢ Running ways-running ways drive travel speeds, reliability and identity. Options range from general traffic lanes to fully grade separated BRT transit ways
➢ Stations –Stations, as the entry point to the system, are the single most important customer interface, affecting accessibility, reliability, comfort, safety and security, as well as dwell times, and system image. BRT station options vary from simple stops with basic shelter to complex intermodal
➢ Vehicles –BRTS system utilized large amount of vehicles, from standard buses to specilised vehicles.options vary from size , design ,internal configuration,horizontal control, capacity and service quality.
➢ Intelligent transportation system –a wide variety of ITS technology can be integrade into BRT system to improve BRT system performance in terms of travel times ,reliability, safety security .ITS option operation ama maintance real time pasanger information and security.
➢ Service and operation plan – design a service plan that meets the need of the population and employment centres in the area and matches for the demand for service is a key.

Kiwale Phata: It is terminal station of Sangvi to kiwale BRTS. Capacity of bus stop nearly about 200-250 persons. Kiwale bus stop connects both National highway NH 4(old Mumbai-Pune) and expressway (Mumbai Bangalore highway). Due to congested traffic, so their must provide proper signal system to avoid accident and in order to smoothly running traffic. In order to smoothly run traffic we better to provide diligent signal system so consequently we can reduce rate of accidents.

People park their vehicles nearby bus stop because of lot of space available for buses, people tends to park their vehicle in this space. On 28th may 2016, a newspaper post an article about kiwale phata is more getting congested with two wheeler so it has be managed properly on need to build a separated parking lot.

Aundh: Indeed pedestrian does not having any single point of safety at dange chowk bus stop lot of routes meet at same place with heavy traffic makes pedestrian to be very cautious about crossing the road.

VII.CONCLUSION

1. We have also provided solution for pedestrian crossing issues use BRT service. We also suggest, it is a good idea to conduct safety audits at different stages like (1) new proposed BRTs bus stop. (2) Underpass for BRTs and (3) Underpass for pedestrian.
2. Traffic police and other security personnel need to back and help the Municipal Corporation and other levels of government organizations to effectively manage the proposed BRTS system.
3. It should be kept in mind that opening day is not a good time to assess what the system will be like a week or a month later, when lessons that are learned can hopefully be put into practice to improve the system.
4. Through this study we find out the few safety issues for vehicles as well as pedestrians.

REFERENCES

[1] A. Sumalatha(Oct 2015) issn: 2277-9655 (i2or), publication impact factor: 3.785http: www.ijesrt.com   © international journal of engineering sciences & research technology[157]IJESRT international journal of engineering sciences & research technology , "bus rapid transit system (brts) in hyderabad"

[2] Bhanu Kireeti Chanda(2014) American Journal of Engineering Research (AJER) e-ISSN : 2320-0847 p-ISSN : 2320-0936 Volume-03, Issue-06, pp-242-246 www.ajer.org , "Introduction to corridor selection & assessment for Bus Rapid Transit System (BRTS) in Hyderabad"

[3] Bruce Appleyard, (2013) Bus Rapid Transit and Economic Development , " Bus Rapid Transit and Economic Development: Case Study of the Eugene-Springfield BRT System"

[4] David hensher(Nov 2006) Frequency and Connectivity David hensher , " Frequency and Connectivity Key Drivers of Reform in Urban Public Transport Provision"

[5] Darshini Mahadevia , "promoting low-carbon transport in india Low-Carbon Mobility in India and the Challenges of Social Inclusion Bus Rapid Transit (BRT) Case Studies in India"

[6] Gupta K (July 2014) International Journal of Innovative Engineering Research (IJIER) Volume 1 Issue 1, " BRTS: An Effective Mode of Public Transport"

[7] Rana Imam(2012) Jordan Journal of Civil Engineering, Volume 6, No. 3, 2012, "Energy Consumption and Environmental Impacts of Bus Rapid Transit (BRT) Systems"

[8] Thaned Satiennam(July 2006) a study on the introduction of bus rapid transit system in asian developing cities t. satiennam, a. fukuda, r. oshima "a study on the introduction of bus rapid transit system in asian developing cities – A Case Study on Bangkok Metropolitan Administration Project –"

[9] Tuhin Subhra Mapar(Dec 2010) Institute of Town Planners, India Journal 7 - 4, 21 - 36, ,"A Methodology for Selection of Bus Rapid Transit Corridors: A Case Study of Kolkata"

[10] William Vincent(2006)was studied by, The Potential for Bus Rapid Transit to Reduce Transportation-Related CO2 Emissions